MX860801A/MX860901A/
MX268101A/MX268301A/MX268701A/
MX860801B/MX860901B/
MX268101B/MX268301B/MX268701B
W-CDMA Measurement Software
(For MS8608A/MS8609A/MS2681A/
MS2683A/MS2687A/MS2687B)
Operation Manual
1 / 2

11th Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS8608A/MS8609A Digital Mobile Radio Transmitter Tester Manual or MS2681A/MS2683A/MS2687A/MS2687B Spectrum Analyzer Operation Manual. Please also refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W1746AE-11.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

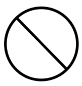
DANGER ⚠ This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

WARNING ⚠ This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

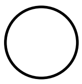
CAUTION ⚠ This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

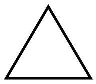
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



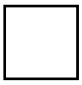
This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



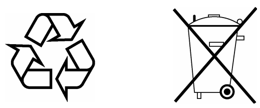
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MX860801A/MX860901A/MX268101A/MX268301A/MX268701A/
MX860801B/MX860901B/MX268101B/MX268301B/MX268701B
W-CDMA Measurement Software (For MS8608A/MS8609A/MS2681A/MS2683A/MS2687A/MS2687B)
Operation Manual
Volume 1 of 2

11 April 2000 (First Edition)
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Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is one year from the purchase date.
- The warranty period after repair or exchange will remain 1 year from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
- This warranty does not cover damage to this software caused by Acts of God, natural disasters, and misuse or mishandling by the customer.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for injury or financial loss of the customer due to the use of or a failure to be able to use this equipment.

Anritsu Corporation Contact

In the event that this equipment malfunctions, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

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Front Panel Power Switch

To prevent malfunction caused by accidental touching, the front power switch of this equipment turns on the power if it is pressed continuously for about one second in the standby state. If the switch is pressed continuously for one second in the power-on state, the equipment enters the standby state.

In the power-on state, if the power plug is removed from the outlet, then reinserted into it, the power will not be turned on. Also, if the lines is disconnected due to momentary power supply interruption or power failure, the power will not be turned on (enters the standby state) even if the line is recovered.

This is because this equipment enters the standby state and prevents incorrect data from being acquired when the line has to be disconnected and reconnected.

For example, if the sweep time is 1,000 seconds and data acquisition requires a long time, momentary power supply interruption (power failure) might occur during measurement and the line could be recovered automatically to power-on. In such a case, the equipment may mistake incorrect data for correct data without recognizing the momentary power supply interruption.

If this equipment enters the standby state due to momentary power supply interruption or power failure, check the state of the measuring system and press the front power switch to restore power to this equipment.

Further, if this equipment is built into a system and the system power has to be disconnected then reconnected, the power for this equipment must also be restored by pressing the front power switch.
Consequently, if this equipment is built into remote monitoring systems that use MODEMs, please install option 46 "Auto Power Recovery" to equipment.

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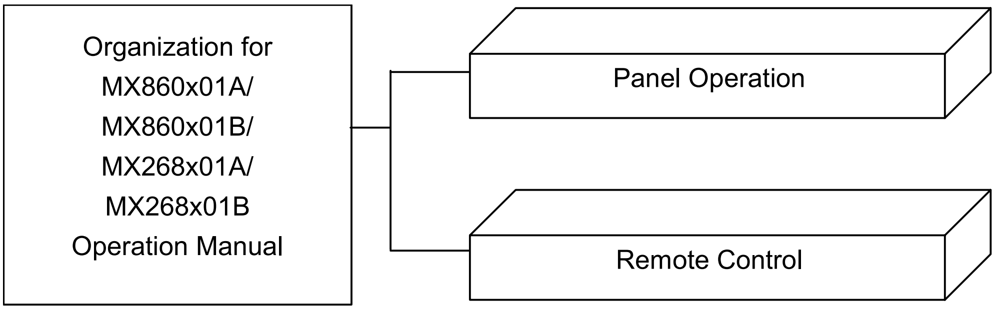
About This Manual

1. This operation manual provides the explanation of the MX860801A/MX860901A/MX268101A/MX268301A/MX268701A/MX860801B/MX860901B/MX268101B/MX268301B/MX268701B W-CDMA Measurement Software when it is installed in the MS8608A/MS8609A Digital Mobile Radio Transmitter Tester and the MS2681A/MS2683A/MS2687A/MS2687B Spectrum Analyzer.
   In this manual, MS8608A/MS8609A is described as MS860x, and MS2681A/MS2683A/MS2687A/MS2687A/MS2687B is described as MS268x.

2. Organization of this manual
   The W-CDMA Measurement Software operation manual is made up of the two parts shown below.



Panel Operation:

Describes the overview, panel explanation, operations and performance test for the W-CDMA Measurement Software.

Remote Control:

Describes the remote control of the W-CDMA Measurement Software via RS-232C/GPIB interface.

MX860801A/MX860901A/MX268101A/MX268301A/ MX268701A/MX860801B/MX860901B/MX268101B/ MX268301B/MX268701B

W-CDMA Measurement Software

(For MS8608A/MS8609A/MS2681A/ MS2683A/MS2687A/MS2687B)

Operation Manual

(Panel Operation)

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Section 1 Overview

This section describes the overview, product configuration, and specifications of the MX860x01A/MX860x01B/MX268x01A/MX268x01B W-CDMA Measurement Software for the MS860x Digital Mobile Radio Transmitter Tester/MS268x Spectrum Analyzer.

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Product Overview

The MS860x Digital Mobile Transmitter Tester (hereafter, ”transmitter tester”) enable high-speed, high-accuracy and also easy measurement of base-station and mobile-station transmitter characteristics for various mobile communications.
The transmitter tester can be used for RF/IF signal evaluation, and more, for device evaluation with IQ (baseband) signal.
This transmitter tester is equipped high-performance spectrum analyzer and power meter. Furthermore, with the installation of measurement software, the transmitter tester can perform modulation analysis for a variety of digital modulation systems. Using high-speed digital signal processing technology also makes fast, accurate measuring possible.

The MS268x Spectrum Analyzer (hereafter, “Spectrum Analyzer”) enable high-speed, high-accuracy and also easy measurement of base-station and mobile-station transmitter characteristics for various mobile communications.
The Spectrum Analyzer can be used for RF/IF signal evaluation, and more, for device evaluation with IQ (baseband) signal.
Furthermore, with the installation of measurement software, the Spectrum Analyzer can perform modulation analysis for a variety of digital modulation systems. Using high-speed digital signal processing technology also makes fast, accurate measuring possible.

By installing the MX860x01A/MX860x01B/MX268x01A/MX268x01B W-CDMA Measurement Software (hereafter, “W-CDMA software”), this transmitter tester and Spectrum Analyzer can function as a comprehensive measuring instrument, enabling easy measurement of functions and performance of radio equipment for W-CDMA digital mobile radio.

Measurement functions of the W-CDMA software are as follows:

- Modulation accuracy analysis/Carrier frequency measurement
- Code domain analysis
- Transmitter power measurement
- Occupied bandwidth measurement
- Adjacent channel leakage power measurement
- Spurious measurement and others

Product Composition

Combinations of transmitter tester/Spectrum Analyzer with W-CDMA software as well as product composition are shown in the tables below.

- When the transmitter tester main body is MS8608A

	Item Name	Q'ty	Model/ Ordering No.	Remarks
Main Unit	W-CDMA measurement software	1	MX860801A or MX860801B	Provided by Memory card
Accessory	Operation manual	1	W1746AE	

- When the transmitter tester main body is MS8609A

	Item Name	Q'ty	Model/ Ordering No.	Remarks
Main Unit	W-CDMA measurement software	1	MX860901A or MX860901B	Provided by Memory card
Accessory	Operation manual	1	W1746AE	

- When the Spectrum Analyzer main body is MS2681A

	Item Name	Q'ty	Model/ Ordering No.	Remarks
Main Unit	W-CDMA measurement software	1	MX268101A or MX268101B	Provided by Memory card
Accessory	Operation manual	1	W1746AE	

- When the Spectrum Analyzer main body is MS2683A

	Item Name	Q'ty	Model/ Ordering No.	Remarks
Main Unit	W-CDMA measurement software	1	MX268301A or Mx268301B	Provided by Memory card
Accessory	Operation manual	1	W1746AE	

- When the Spectrum Analyzer main body is MS2687A/B

	Item Name	Q'ty	Model/ Ordering No.	Remarks
Main Unit	W-CDMA measurement software	1	MX268701A or MX268701B	Provided by Memory card
Accessory	Operation manual	1	W1746AE	

Product Specifications

・ Specifications for MX860801A/MX860801B W-CDMA Measurement Software

Item	Specifications	Remarks
Model and software name	MX860801A/MX860801B W-CDMA Measurement Software (for MS8608A)	
Application	Measurement of W-CDMA mobile radio transmission characteristics	
Electric performance (RF Input)	Compliance to the following specifications is guaranteed after the execution of internal level optimization for MS8608A (executed automatically by pressing a key)	
Modulation/frequency measurement		
Measurement frequency range	50 MHz to 3 GHz or 50MHz to 2.3 GHz (when MS8608A-08 is installed)	
Measurement level range	−40 to +40 dBm (average power): During High Power input −60 to +20 dBm (average power): During Low Power input −80 to +10 dBm (average power): During Low Power input when Pre-Amplifier is ON *1	
Carrier frequency accuracy	±(Accuracy of reference crystal oscillator +10 Hz) on code channel 1CH at the following input level: ≥−10 dBm (during High Power input) ≥−30 dBm(during Low Power input) ≥−40 dBm (during Low Power input and Pre-Amplifier ON *1)	
Modulation accuracy		
Residual vector error	< 2.0% (rms) on code channel 1CH at the following input level: ≥−10 dBm (during High Power input) ≥−30 dBm(during Low Power input) ≥−40 dBm (during Low Power input with Pre-Amplifier ON *1)	
Origin offset accuracy	±0.5 dB(relative to signal of origin offset −30 dBc) on code channel 1CH at the following input level: ≥−10 dBm (during High Power input) ≥−30 dBm(during Low Power input) ≥−40 dBm (during Low Power input with Pre-Amplifier ON *1)	
Waveform display	Displays the following items for 1CH to multi-CH input signal. Constellation display Vector error vs. Chip No. display Phase error vs. Chip No. display Amplitude error vs. Chip No. display	

*1:Pre-Amplifier ON can be set when the MS8608A-08 (main-body option) is instelled.

Item	Specifications	Remarks
Code domain analysis		
Measurement frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8608A-08 is installed)	
Measurement level range	−40 to +40 dBm (average power): During High Power input −60 to +20 dBm (average power): During Low Power input −80 to +10 dBm (average power): During Low Power input with Pre-Amplifier ON *1	
Code domain power accuracy	±0.1 dB (code power ≥−10 dBc) and ±0.3 dB (code power ≥−25 dBc) as the signal does not contain Origin Offset at the following input level: ≥+10 dBm (during High Power input) ≥−10 dBm (during Low Power input) ≥−20 dBm (during Low Power input with Pre-Amplifier ON *1)	
Code domain error	On spreading factor: 512 (Down Link) or 256 (Up Link) as the signal does not contain Origin Offset at the following input level: ≥+10 dBm (during High Power input) ≥−10 dBm (during Low Power input) ≥−20 dBm (during Low Power input with Pre-Amplifier ON *1)	
Residual error	<−50 dB	
Accuracy	±0.5 dB (relative to error of −30 dBc)	
Display function	Displays code domain power and code domain error. Corresponding spreading factor: 4 to 256 (Up Link) or 4 to 512 (Down Link) Automatic spreading factor a detection function available Displays I and Q separately for Up Link SCH level measuring function available *2	
Code vs Slot measurement *2	Measures Code Domain Power for each slot of specified Code Channel up to 150 slots (applicable to Compressed Mode of Down Link).	

*1:Pre-Amplifier ON can be set when the MS8608A-08 (main-body option) is instelled.

*2:Characteristic of MS860801B

Item	Specifications	Remarks
Amplitude measurement Frequency range Measurement level range Transmitter power measurement meansurement range Accuracy Power measurement linearity Filter selection function Transmitter power control measurement function RACH measuring function *2	 50 MHz to 3 GHz or 50 MHz to 2.3GHz (when MS8608A-08 is installed) −40 to +40 dBm (average power): During High Power input −60 to +20 dBm (average power): During Low Power input −80 to +10 dBm (average power): During Low Power input with Pre-Amplifier ON *1 After execution of level calibaration using the built-in power meter (executed automatically by pressing a key). 0 to +40 dBm (average power): During High Power input −20 to +20 dBm (average power): During Low Power input −20 to +10 dBm (average power): During Low Power input with Pre-Amplifiere ON *1 ±0.4 dB ±0.2 dB (0 to −40 dB) When the reference level setting remains unchanged after range optimizarion at the following input level: ≥+10 dBm (during High Power input) ≥−10 dBm (during Low Power input) ≥−20 dBm (during Low Power input with Pre-Amplifier ON *1) Enables the measurement of the value of the power passed through the RRC (α = 0.22) filter. Displays relative power for each slot. Pass/File judgment function available. Maximum: 15 slots for MX860801A, 150 slots for MX860801B Measures the time difference between preamble RACH signal and message RACH signal.	
Occupied bandwidth measurement Frequency range Measurement level range Measurement method Sweep FFT	 50 MHz to 3 GHz −40 to +40 dBm (average power): During High Power input −60 to +20 dBm (average power): During Low Power input −80 to +10 dBm (average power): During Low Power input with Pre-Amplifier ON *1 Performs calculations and displays the calculation results after measurement of a target signal with the sweeping-type spectrum analyzer. Performs calculations and displays the calculation results after analysis of a target signal with FFT.	

*1: Pre-Amplifier ON can be set when the MS8608A-08 (main-body option) is installed

*2: Characteristic of MX860801B

Item	Specifications	Remarks
Adjacent channel leakage power measurement		
Frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8608A-08 is installed)	
Input level range	+10 to +40 dBm (average power): During High Power input −10 to +20 dBm (average power): During Low Power input	
Measurement method		
Sweep method (all)	Performs calculations and displays the calculation results after measurement of the target signal with the sweeping-type spectrum analyzer.	
Sweep method (separate)	Performs calculations and displays the calculation results after measurement of adjacent channel and the next adjacent channel with sweeping-type spectrum analyzer.	
Filtering method	Measures the value of the power (rms) passed through the built-in reception filter (RRC: α = 0.22) in the adjacent channels and the next adjacent channels, and displays the measured results.	
Measurement range	Code channel 1 CH: 5 MHz detuning: ≥55 dBc and 10 MHz detuning: ≥62 dBc Code channel 16 CH-multiplexed (only when MS8608A-08 is not installed): 5 MHz detuning: ≥50 dBc and 10 MHz detuning: ≥60 dBc at the following input level using wide dynamic range mode in filtering method: ≥+20 dBm (during High Power input) ≥0 dBm (during Low Power input) Code channel 1 CH: 5 MHz detuning: ≥55 dBc (typical) and 10MHz detuning: ≥62 dBc (typical) Code channel 16CH-multiplexed: 5 MHz detuning: ≥50 dBc (typical) and 10 MHz detuning: ≥60 dBc (typical) at the following input level using wide dynamic range mode in filtering method: ≥+10 dBm (during High Power input) ≥−10 dBm (during Low Power input),	

Item	Specifications	Remarks
Spurious measurement Measurement frequency range Input level range (Transmitter power) Measurement method Sweep method Spot method Search method Measurement range When MS8608A-03 option is installed	 9 kHz to 7.8 GHz, excluding carrier frequency ±50 MHz +20 to +40 dBm (average power): During High Power input 0 to +20 dBm (average power): During Low Power input Detects and displays the peak value after the spectrum analyzer sweeps a specified frequency range. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.). Measures the specified frequency in the time domain on the specturn analyzer, and displays the average value. The power ratio, which is the ratio to the TX power volue, is caluculated and displayed. (Specifications are values measured when detection mode is set to Average.). Detects the peak value after the spectrum analyzer sweeps a specified frequency range, measures the frequency in the time domain, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are value measured when detection mode is set to Average.). Carrier frequency: 1,800 to 2,200 MHz (excluding the spurious in the Note below) ≥79 dB (RBW: 1 kHz) (9 to 150 kHz, band 0) ≥79 dB (RBW: 10 kHz) (150 kHz to 30 MHz, band 0) ≥79 dB (RBW: 100 kHz) (30 to 1,000 MHz, band 0) In normal mode ≥76−f[GHz]dB (RBW: 1MHz) (1,000 to 3,150 MHz, band 0) ≥76 dB (RBW: 1MHz) (3,150 to 7,800 MHz, band 1) In Spurious mode ≥76 dB (RBW: 1MHz) (1,600 to 7,800 MHz, band 1) *Note:* In the carrier frequency range of 2,030.354 to 2,200 MHz, spurious are generated at the following frequencies. f(spurious) = f(in)−2030.345 MHz	
Spectrum Emission Mask Measurement	Performs Template judgment and displays the result after measurement of a target signal with the sweeping-type spectrum analyzer.	
Demodulation data Measurement	On the specified code channel, Data after reverse spreading can output up to 10 frames.	
CCDF measurement *2 Frequency range Measurement level range Measurement method CCDF APD Filter selection function	 50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8608A-08 is installed) −40 to +40 dBm (average power): During High Power input −60 to +20 dBm (average power): During Low Power input −80 to +10 dBm (average power): During Low Power input with Pre-Amplifier ON *1 Displays cumulative distribution of power difference between instantaneous power and average power. Displays distribution of power difference between instantaneous power and average power. 20 MHz, 10 MHz, 5 MHz, 3 MHz, RRC: α = 0.22, RC: α = 0.22	

*1:Pre-Amplifier ON can be set when the MS8608A-08 (main-body option) is installed.

*2:Characteristic of MX860801B

Item	Specifications	Remarks
Electrical performance (I/Q Input)		
Input method	Selection of Balance or Unbalance is possible	
Input impedance	Selection of 1 MΩ (Parallel capacitance < 100 pF) and 50 Ω is possible.	
Input level range		
Balance input	Differential voltage range: 0.1 to 1 Vpp (at input connector) Common-mode voltage range: ±2.5 V (at input connector)	
Unbalance input	0.1 to 1 Vpp (at input connector) Switching between DC coupling and AC coupling is possible.	
Measurement items	Modulation accuracy measurement, code domain power, amplitude mesurement, occupied bandwidth (FFT method) and IQ level measurement	
Modulation accuracy measurement	Input level: ≥0.1 V (rms)	
Residual vector error	<2% (rms), DC coupling, as the signal does not contain Origin Offset	
IQ level measurement		
Level measurement	Measures and displays the input voltage (rms and peak-to-peak values) for I and Q inputs.	
IQ phase difference measurement	Measures and displays the phase difference between the I-phase signal and Q-phase signal when a CW signal is input to the I,Q Input connectors.	

・ Specifications for MX860901A/MX860901B W-CDMA Measurement Software

Item	Specifications	Remarks
Model and software name	MX860901A/MX860901B W-CDMA Measurement software (for MS8609A)	
Application	Measurement for W-CDMA mobile radio transmission characteristics	
Electric performance (RF Input)	Compliance to the following specifications is guaranteed after the execution of internal level optimization for MS8609A (executed automatically by pressing a key).	
Modulation/frequency measurement Measurement frequency range Measurement level range Carrier frequency accuracy Modulation accuracy Residual vector error Origin offset accuracy Waveform display	 50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8609A-08 is installed) −60 to +20 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1 ±(Accuracy of reference crystal oscillator +10 Hz) on code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) or ≥−40 dBm (during Pre-Amplifier ON *1) < 2.0% (rms) on code channel 1 CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1) ±0.5 dB (relative to signal origin offset of −30 dBc) for only code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1) Displays the following items for 1CH to multi-CH input signals. Constellation display Vector error vs. Chip No. display Phase error vs. Chip No. display Amplitude error vs. Chip No. display	

*1:Pre-Amplifier ON can be set when the MS8609A-08 (option) is installed.

Item	Specifications	Remarks
Code domain analysis		
Measurement frequency range	50 MHz to 3 GHz or 50 MHz to 2.3GHz (when MS8609A-08 is installed)	
Measurement level range	−60 to +20 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Code domain power accuracy	±0.1 dB (code power ≥−10 dBc) and ±0.3 dB (code power ≥−25 dBc) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Code domain error	On spreading factor: 512 (Down Link) or 256 (Up Link) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Residual error	< −50 dB	
Accuracy	±0.5 dB (relative to error of −30 dBc)	
Display function	Displays code domain power and code domain error. Corresponding spreading factor: 4 to 256 (Up Link) or 4 to 512 (Down Link) Automatic spreading factor detection function available, Displays I and Q separately for Up Link SCH level measuring function available *2	
Code vs Slot measurement *2	Measures Code Domain Power for each slot of specified Code Channel up to 150 slots (applicable to Compressed Mode of Down Link).	
Amplitude measurement		
Frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8609A-08 is installed)	
Measurement level range	−60 to +20 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Transmitter power measurement	After execution of level calibration using the built-in power meter (executed automatically by pressing a key)	
Measurement range	−20 to +20 dBm (average power): During Pre-Amplifier OFF −20 to +10 dBm (average power): During Pre-Amplifier ON *1	
Accuracy	±0.4 dB	
Power measurement linearity	±0.2 dB (0 to −40 dB) When the reference level setting remains unchanged after range optimization at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Filter selection function	Enables the measurement of the value of the power passed through the RRC (α = 0.22) filter.	
Transmitter power control measurement function	Displays relative power for each slot. Pass/Fail judgment function available. Maximum: 15 slots for MX860901A, 150 slots for MX860901B	
RACH measuring function *2	Measures the time difference between preamble RACH signal and message RACH signal.	
Occupied bandwidth measurement		
Frequency range	50MHz to 3 GHz	
Measurement level range	−60 to +20 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Measurement method		
Sweep method	Performs calculations and displays the calculation results after measurement of a target signal with the sweeping-type spectrum analyzer.	
FFT method	Performs calculations and displays the calculation results after analysis of a target signal with FFT.	

*1:Pre-Amplifier ON can be set when the MS8609A-08 (main-body option) is instelled.

*2:Characteristic of MS860901B

Item	Specifications	Remarks
Adjacent channel leakage power measurement		
Frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS8609A-08 is installed)	
Input level range	−10 to +20 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep (all) method	Performs calculations and displays the calculation results after measurement of the target signal with the sweeping-type spectrum analyzer.	
Sweep (separate) method	Performs calculations and displays the calculation results after measurement of adjacent channel and the next adjacent channel with the sweeping-type spectrum analyzer.	
Filtering method	Measures the value of the power (rms) passed through the built-in reception filter (RRC: α = 0.22) in the adjacent channel and the next adjacent channel, and displays the measured results.	
Measurement range	Code channel 1CH: 5 MHz detuning: ≥55 dBc and 10 MHz detuning: ≥62 dBc Code channel 16CH multiplexed (only when MS8609A-08 is not installed): 5 MHz detuning: ≥50 dBc and 10 MHz detuning: ≥60 dBc at the following input level: ≥0 dBm, using wide dynamic range mode in filtering method Code channel 1CH: 5 MHz detuning: 55 dBc (typical) and 10MHz detuning: 62 dBc (typical) Code channel 16CH multiplexed: 5 MHz detuning: 50 dBc (typical) and 10 MHz detuning: 60 dBc (typical) at the following input level: ≥−10 dBm, using wide dynamic range mode in filtering method	
Spurious measurement		
Measurement frequency range	9 kHz to 12.75 GHz, excluding carrier frequency ±50 MHz	
Input level range (Transmitter power)	0 to +20 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep method	Detects and displays the peak value after the spectrum analyzer sweeps in a specified frequency range. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Spot method	Measures the specified frequency in the time domain on the spectrum analyzer, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Search method	Detects the peak value after the spectrum analyzer sweeps a specified frequency range, measures the frequency in the time domain, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Measurement range	Carrier frequency: 1,800 to 2,200 MHz (excluding the spurious in the Note below) ≥79 dB (RBW: 1kHz) (9 to 150 kHz, band 0) ≥79 dB (RBW: 10kHz) (150 kHz to 30 MHz, band 0) ≥79 dB (RBW: 100kHz) (30 to 1,000 MHz, band 0) ≥76−f[GHz]dB (RBW: 1MHz) (1,000 to 3,150 MHz, band 0) ≥76 dB (RBW: 1MHz) (3,150 to 7,800 MHz, band 1) *Note:* In the carrier frequency range of 2,030.354 to 2,200MHz, spurious are generated at the following frequencies. f(spurious) = f(in)−2030.345 MHz	

Item	Specifications	Remarks
Spectrum Emission Mask Measurement	Performs Template judgment and displays the result after measurement of a target signal with the sweeping-type spectrum analyzer.	
Demodulation data Measurement	On the specified code channel, Data after reverse spreading can output up to 10 frames	
CCDF measurement *2		
Frequency range	50 MHz to 3 GHz, 50 MHz to 2.3 GHz (when MS8609A-08 is installed)	
Measurement level range	−60 to +20 dBm (average power): when Pre-Amplifier is OFF *1 −80 to +10 dBm (average power): when Pre-Amplifier is ON *1	
Measurement method		
CCDF	Displays cumulative distribution of power difference between instantaneous power and average power.	
APD	Displays distribution of power difference between instantaneous power and average power.	
Filter selection function	20 MHz, 10 MHz, 5 MHz, 3 MHz, RRC: α = 0.22, RC: α = 0.22	
Electrical performance (I/Q Input)		
Input method	Selection of Balance and Unbalance is possible	
Input impedance	Selection of 1 MΩ (parallel capacitance < 100 pF) and 50 Ω is possible.	
Input level range		
Balance input	Differential voltage range: 0.1 to 1 Vpp (at input connector) Common-mode voltage range: ±2.5 V (at input connector)	
Unbalance input	0.1 to 1 Vpp (at the input connector) Switching between DC coupling and AC coupling is possible.	
Measurenent items	Modulation accuracy measurement, code domain power, amplitude mesurement, occupied bandwidth (FFT method) and IQ level measurement	
Modulation accuracy measurement	Input level: ≥0.1 V (rms)	
Residual vector error	<2% (rms), DC coupling, as the signal does not contain Origin Offset	
IQ level measurement		
Level measurement	Measures and displays the input voltages (rms and peak-to-peak values) for I and Q inputs.	
IQ phase difference measurement	Measures and displays the phase difference between the I-phase signal and Q-phase signal when a CW signal is input to the I/Q Input connectors.	

*1:Pre-Amplifier ON can be set when the MS8609A-08 (main-body option) is installed

*2:Characteristic of MX860901B

・ Specifications for MX268101A/MX268101B W-CDMA Measurement Software

Item	Specifications	Remarks
Model and software name	MX268101A/MX268101B W-CDMA Measurement Software (for MS2681A)	
Application	Measurement for W-CDMA mobile radio transmission characteristics	
Electric performance (RF Input)	Compliance to the following specifications is guaranteed after the execution of internal level optimization for MS2681A (executed automatically by pressing a key).	
Modulation/frequency measurement		
Measurement frequency range	50 MHz to 3 GHz or 50MHz to 2.3 GHz (when MS2681A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Carrier frequency accuracy	±(Accuracy of reference crystal oscillator +10 Hz) on code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Modulation accuracy		
Residual vector error	< 2.0% (rms) on code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Origin offset accuracy	±0.5 dB (relative to signal origin offset of −30 dBc) for only code channel 1CH at the following input level: ≥−30 dBm(during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Waveform display	Displays the following items for 1CH to multi-CH input signals. Constellation display Vector error vs. Chip No. display Phase error vs. Chip No. display Amplitude error vs. Chip No. display	

*1:Pre-Amplifier ON can be set when the MS2681A-08 (option) is installed.

Item	Specifications	Remarks
Code domain analysis Measurement frequency range Measurement level range Code domain power accuracy Code domain error Residual error Accuracy Display function Code vs Slot measurement *2	 50 MHz to 3 GHz or 50 MHz to 2.3GHz (when MS2681A-08 is installed) −60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1 ±0.1 dB (code power ≥−10 dBc) and ±0.3 dB (code power ≥−25 dBc) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1) On spreading factor: 512 (Down Link) or 256 (Up Link) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1) < −50 dB ±0.5 dB (relative to error of −30 dBc) Displays code domain power and code domain error. Corresponding spreading factor: 4 to 256 (Up Link) or 4 to 512 (Down Link) Automatic spreading factor detection function available, Displays I and Q separately for Up Link SCH level measuring function available *2 Measures Code Domain Power for each slot of specified Code Channel up to 150 slots (applicable to Compressed Mode of Down Link).	
Amplitude measurement Frequency range Measurement level range Transmitter power measurement Measurement range Accuracy Power measurement linearity Filter selection function Transmitter power control measurement function RACH measuring function *2	 50 MHz to 3 GHz or 50MHz to 2.3 GHz (when MS2681A-08 is installed) −60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1 −20 to +30 dBm (average power): During Pre-Amplifier OFF −20 to +10 dBm (average power): During Pre-Amplifier ON *1 ±2 dB (typical) ±0.2 dB (0 to −40 dB) When the reference level setting remains unchanged after range optimization at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1) Enables the measurement of the value of the power passed through the RRC (α = 0.22) filter. Displays relative power for each slot. Pass/Fail judgment function available. Maximum: 15 slots for MX268101A, 150 slots for MX268101B Measures the time difference between preamble RACH signal and message RACH signal.	
Occupied bandwidth measurement Frequency range Measurement level range Measurement method Sweep method FFT method	 50 MHz to 3 GHz −60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1 Performs calculations and displays the calculation results after measurement of a target signal with the sweeping-type spectrum analyzer. Performs calculations and displays the calculation results after analysis of a target signal with FFT.	

*1:Pre-Amplifier ON can be set when the MS2681A-08 (main-body option) is instelled.

*2:Characteristic of MS268101B

Item	Specifications	Remarks
Adjacent channel leakage power measutement		
Frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS2681A-08 is installed)	
Input level range	−10 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep (all) method	Performs calculations and displays the calculation results after measurement of the target signal with the sweeping-type spectrum analyzer.	
Sweep (separate) method	Performs calculations and displays the calculation results after measurement of adjacent channel and the next adjacent channel with the sweeping-type spectrum analyzer.	
Filtering method	Measures the value of the power (rms) passed through the built-in reception filter (RRC: α = 0.22) in the adjacent channel and the next adjacent channel, and displays the measured results.	
Measurement range	Code channel 1CH: 5 MHz detuning: ≥55 dBc and 10 MHz detuning: ≥62 dBc Code channel 16CH multiplexed (only when MS2681A-08 is not installed): 5 MHz detuning: ≥50 dBc and 10 MHz detuning: ≥60 dBc at the following Input level: ≥0 dBm, using wide dynamic range mode in filtering method Code channel 1CH: 5 MHz detuning: 55 dBc (typical) and 10MHz detuning: 62 dBc (typical) Code channel 16CH multiplexed: 5 MHz detuning: 50 dBc (typical) and 10 MHz detuning: 60 dBc (typical) at the following Input level: ≥−10 dBm, using wide dynamic range mode in filtering method	
Spurious measurement		
Measurement frequency range	9 kHz to 3.0 GHz, excluding carrier frequency ±50 MHz	
Input level range (Transmitter power)	0 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep method	Detects and displays the peak value after the spectrum analyzer sweeps in a specified frequency range. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Spot method	Measures the specified frequency in the time domain on the spectrum analyzer, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Search method	Detects the peak value after the spectrum analyzer sweeps a specified frequency range, measures the frequency in the time domain, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Measurement range	Carrier frequency: 1,800 to 2,200 MHz (excluding the spurious in the Note below) ≥79 dB (typical) (RBW: 1kHz) (9 to 150 kHz) ≥79 dB (typical) (RBW: 10kHz) (150 kHz to 30 MHz) ≥79 dB (typical) (RBW: 100kHz) (30 to 1,000 MHz) ≥76−f[GHz]dB (typical) (RBW: 1MHz) (1,000 to 3000 MHz) *Note:* In the carrier frequency range of 2,030.354 to 2,200MHz, spurious are generated at the following frequencies. f(spurious) = f(in)−2030.345 MHz	

Item	Specifications	Remarks
Spectrum Emission Mask Measurement	Performs Template judgment and displays the result after measurement of a target signal with the sweeping-type spectrum analyzer.	
Demodulation data Measurement	On the specified code channel, Data after reverse spreading can output up to 10 frames	
CCDF measurement *2		
Frequency range	50 MHz to 3 GHz, 50 MHz to 2.3 GHz (when MS2681A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): when Pre-Amplifier is OFF *1 −80 to +10 dBm (average power): when Pre-Amplifier is ON *1	
Measurement method		
CCDF	Displays cumulative distribution of power difference between instantaneous power and average power.	
APD	Displays distribution of power difference between instantaneous power and average power.	
Filter selection function	20 MHz, 10 MHz, 5 MHz, 3 MHz, RRC: α = 0.22,, RC: α = 0.22	
Electrical performance (I/Q Input)	This function is available when MS2681A-17 or 18 option is installed.	
Input method	When MS2681A-17 is installed: Either Balanced or Unbalanced When MS2681A-18 is installed: Unbalanced	
Input impedance	Selection of 1 MΩ (parallel capacitance < 100 pF) and 50 Ω is possible.	
Input level range		
Balance input	Differential voltage range: 0.1 to 1 Vpp (at input connector) Common-mode voltage range: ±2.5 V (at input connector)	
Unbalance input	0.1 to 1 Vpp (at the input connector) Switching between DC coupling and AC coupling is possible.	
Measurenent items	Modulation accuracy measurement, code domain power, amplitude mesurement, occupied bandwidth (FFT method) and IQ level measurement	
Modulation accuracy measurement	Input level: ≥0.1 V (rms)	
Residual vector error	<2% (rms), DC coupling, as the signal does not contain Origin Offset	
IQ level measurement		
Level measurement	Measures and displays the input voltages (rms and peak-to-peak values) for I and Q inputs, respectively.	
IQ phase difference Measurement	Measures and displays the phase difference between the I-phase signal and Q-phase signal when a CW signal is input to the I/Q Input connectors.	

*1:Pre-Amplifier ON can be set when the MS2681A-08 (main-body option) is installed

*2:Characteristic of MX268101B

・ Specifications for MX268301A/MX268301B W-CDMA Measurement Software

Item	Specifications	Remarks
Model and software name	MX268301A/MX268301B W-CDMA Measurement Software (for MS2683A)	
Application	Measurement for W-CDMA mobile radio transmission characteristics	
Electric performance (RF Input)	Compliance to the following specifications is guaranteed after the execution of internal level optimization for MS2683A (executed automatically by pressing a key).	
Modulation/frequency measurement		
Measurement frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS2683A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Carrier Frequency accuracy	±(Accuracy of reference crystal oscillator +10 Hz) on code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Modulation accuracy		
Residual vector error	< 2.0% (rms) on code channel 1CH at the following input level: ≥−30 dBm (during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Origin offset accuracy	±0.5 dB (relative to signal origin offset of −30 dBc) for only code channel 1CH at the following input level: ≥−30 dBm(during Pre-Amplifier OFF) ≥−40 dBm (during Pre-Amplifier ON *1)	
Waveform display	Displays the following items for 1CH to multi-CH input signals. Constellation display Vector error vs. Chip No. display Phase error vs. Chip No. display Amplitude error vs. Chip No. display	

*1:Pre-Amplifier ON can be set when the MS2683A-08 (option) is installed.

Item	Specifications	Remarks
Code domain analysis		
Measurement frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS2683A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Code domain power accuracy	±0.1 dB (code power ≥−10 dBc) and ±0.3 dB (code power ≥−25 dBc) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Code domain error	On spreading factor: 512 (Down Link) or 256 (Up Link) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Residual error	< −50 dB	
Accuracy	±0.5 dB (relative to error of −30 dBc)	
Display function	Displays code domain power and code domain error. Corresponding spreading factor: 4 to 256 (Up Link) or 4 to 512 (Down Link) Automatic spreading factor detection function available, Displays I and Q separately for Up Link SCH level measuring function available *2	
Code vs Slot measurement *2	Measures Code Domain Power for each slot of specified Code Channel up to 150 slots (applicable to Compressed Mode of Down Link).	
Amplitude measurement		
Frequency range	50MHz to 3 GHz or 50MHz to 2.3 GHz (when MS2683A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Transmitter power measurement		
Measurement range	−20 to +30 dBm (average power): During Pre-Amplifier OFF −20 to +10 dBm (average power): During Pre-Amplifier ON *1	
Accuracy	±2 dB (typical)	
Power measurement linearity	±0.2 dB (0 to −40 dB) When the reference level setting remains unchanged after range optimization at the following input level: ≥−10 dBm (during Pre-Amplifier OFF) ≥−20 dBm (during Pre-Amplifier ON *1)	
Filter selection function	Enables the measurement of the value of the power passed through the RRC (α = 0.22) filter.	
Transmitter power control measurement function	Displays relative power for each slot. Pass/Fail judgment function available. Maximum: 15 slots for MX268301A, 150 slots for MX268301B	
RACH measuring function *2	Measures the time difference between preamble RACH signal and message RACH signal.	
Occupied bandwidth measurement		
Frequency range	50 MHz to 3 GHz	
Measurement level range	−60 to +30 dBm (average power): During Pre-Amplifier OFF −80 to +10 dBm (average power): During Pre-Amplifier ON *1	
Measurement method		
Sweep method	Performs calculations and displays the calculation results after measurement of a target signal with the sweeping-type spectrum analyzer.	
FFT method	Performs calculations and displays the calculation results after analysis of a target signal with FFT.	

*1:Pre-Amplifier ON can be set when the MS2683A-08 (main-body option) is instelled.

*2:Characteristic of MS268301B

Item	Specifications	Remarks
Adjacent channel leakage power measurement		
Frequency range	50 MHz to 3 GHz or 50 MHz to 2.3 GHz (when MS2683A-08 is installed)	
Input level range	−10 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep (all) method	Performs calculations and displays the calculation results after measurement of the target signal with the sweeping-type spectrum analyzer.	
Sweep (separate) method	Performs calculations and displays the calculation results after measurement of adjacent channel and the next adjacent channel with the sweeping-type spectrum analyzer.	
Filtering method	Measures the value of the power (rms) passed through the built-in reception filter (RRC: α = 0.22) in the adjacent channel and the next adjacent channel, and displays the measured results.	
Measurement range	Code channel 1CH: 5 MHz detuning: 55 dBc and 10 MHz detuning: 62 dBc Code channel 16 CH multiplexed (only when MS2683A-08 is not installed): 5 MHz detuning: 50 dBc and 10 MHz detuning: 60 dBc at the following Input level: ≥0 dBm, using wide dynamic range mode in filtering method Code channel 1CH: 5 MHz detuning: 55 dBc (typical) and 10MHz detuning: 62 dBc (typical) Code channel 16CH multiplexed: 5 MHz detuning: 50 dBc (typical) and 10 MHz detuning: 60 dBc (typical) at the following Input level: ≥−10 dBm, using wide dynamic range mode in filtering method	
Spurious measurement		
Measurement frequency range	9 kHz to 7.8 GHz, excluding carrier frequency ±50 MHz	
Input level range (Transmitter power)	0 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep method	Detects and displays the peak value after the spectrum analyzer sweeps in a specified frequency range. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Spot method	Measures the specified frequency in the time domain on the spectrum analyzer, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Search method	Detects the peak value after the spectrum analyzer sweeps a specified frequency range, measures the frequency in the time domain, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Measurement range	Carrier frequency: 1,800 to 2,200 MHz (excluding the spurious in the Note below) ≥79 dB (typical) (RBW: 1kHz) (9 to 150 kHz, band 0) ≥79 dB (typical) (RBW: 10kHz) (150 kHz to 30 MHz, band 0) ≥79 dB (typical) (RBW: 100kHz) (30 to 1,000 MHz, band 0) ≥76−f[GHz]dB (typical) (RBW: 1MHz) (1,000 to 3,150 MHz, band 0) ≥76 dB (typical) (RBW: 1MHz) (3,150 to 7,800 MHz, band 1) *Note:* In the carrier frequency range of 2,030.354 to 2,200MHz, spurious are generated at the following frequencies. f(spurious) = f(in)−2030.345 MHz	

Item	Specifications	Remarks
Spectrum Emission Mask Measurement	Performs Template judgment and displays the result after measurement of a target signal with the sweeping-type spectrum analyzer.	
Demodulation data Measurement	On the specified code channel, Data after reverse spreading can output up to 10 frames.	
CCDF measurement *2		
Frequency range	50 MHz to 3 GHz, 50 MHz to 2.3GHz (when MS2683A-08 is installed)	
Measurement level range	−60 to +30 dBm (average power): when Pre-Amplifier is OFF *1 −80 to +10 dBm (average power): when Pre-Amplifier is ON *1	
Measurement method		
CCDF	Displays cumulative distribution of power difference between instantaneous power and average power.	
APD	Displays distribution of power difference between instantaneous power and average power.	
Filter selection function	20 MHz, 10 MHz, 5 MHz, 3 MHz, RRC: α = 0.22, RC: α = 0.22	
Electrical performance (I/Q Input)	This function is available when MS2683A-17 or 18 option is installed.	
Input method	When MS2683A-17 is installed: Either Balanced or Unbalanced When MS2683A-18 is installed: Unbalanced	
Input impedance	Selection of 1 MΩ (parallel capacitance < 100 pF) and 50 Ω is possible.	
Input level range		
Balance input	Differential voltage range: 0.1 to 1 Vpp (at input connector) Common-mode voltage range: ±2.5 V (at input connector)	
Unbalance input	0.1 to 1 Vpp (at the input connector) Switching between DC coupling and AC coupling is possible.	
Measurement items	Modulation accuracy measurement, code domain power, amplitude mesurement, occupied bandwidth (FFT method) and IQ level measurement	
Modulation accuracy measurement	Input level: ≥0.1 V (rms)	
Residual vector error	<2% (rms), DC coupling, as the signal does not contain Origin Offset	
IQ level measurement		
Level measurement	Measures and displays the input voltages (rms and peak-to-peak values) for I and Q inputs, respectively.	
IQ phase difference Measurement	Measures and displays the phase difference between the I-phase signal and Q-phase signal when a CW signal is input to the I/Q Input connectors.	

*1:Pre-Amplifier ON can be set when the MS2683A-08 (main-body option) is installed

*2:Characteristic of MX268301B

・ Specifications for MX268701A/MX268701B W-CDMA Measurement Software

Item	Specifications	Remarks
Model and software name	MX268701A/MX268701B W-CDMA Measurement Software (for MS2687A/B)	
Application	Measurement for W-CDMA mobile radio transmission characteristics	
Electric performance (RF Input)	Compliance to the following specifications is guaranteed after the execution of internal level optimization for MS2687A/B (executed automatically by pressing a key).	
Modulation/frequency measurement		
Measurement frequency range	50 MHz to 3 GHz	
Measurement level range	−50 to +30 dBm (average power)	
Carrier Frequency accuracy	±(Accuracy of reference crystal oscillator +10 Hz) on code channel 1CH at the following input level: ≥−30 dBm	
Modulation accuracy		
Residual vector error	< 2.0% (rms) on code channel 1CH at the following input level: ≥−30 dBm	
Origin offset accuracy	±0.5 dB (relative to signal origin offset of −30 dBc) for only code channel 1CH at the following input level: ≥−30 dBm	
Waveform display	Displays the following items for 1CH to multi-CH input signals. Constellation display Vector error vs. Chip No. display Phase error vs. Chip No. display Amplitude error vs. Chip No. display	

*1:Characteristic of MX268701B

Item	Specifications	Remarks
Code domain analysis		
Measurement frequency range	50 MHz to 3 GHz	
Measurement level range	−50 to +30 dBm (average power)	
Code domain power accuracy	±0.1 dB (code power ≥−10 dBc) and ±0.3 dB (code power ≥−25 dBc) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm	
Code domain error	On spreading factor: 512 (Down Link) or 256 (Up Link) as the signal does not contain Origin Offset at the following input level: ≥−10 dBm	
Residual error	< −50 dB	
Accuracy	±0.5 dB (relative to error of −30 dBc)	
Display function	Displays code domain power and code domain error. Corresponding spreading factor: 4 to 256 (Up Link) or 4 to 512 (Down Link) Automatic spreading factor detection function available, Displays I and Q separately for Up Link SCH level measuring function available *1	
Code vs Slot measurement *1	Measures Code Domain Power for each slot of specified Code Channel up to 150 slots (applicable to Compressed Mode of Down Link).	
Amplitude measurement		
Frequency range	50 MHz to 3 GHz	
Measurement level range	−50 to +30 dBm (average power)	
Transmitter power measurement		
Measurement range	−20 to +30 dBm (average power)	
Accuracy	±2dB (typical)	
Power measurement linearity	±0.2 dB (0 to −30dB) When the reference level setting remains unchanged after range optimization at the following input level: ≥−10 dBm	
Filter selection function	Enables the measurement of the value of the power passed through the RRC (α = 0.22) filter.	
Transmitter power control measurement function	Displays relative power for each slot. Pass/Fail judgment function available. Maximum: 15 slots for MX268701A, 150 slots for MX268701B	
RACH measuring function *1	Measures the time difference between preamble RACH signal and message RACH signal.	
Occupied bandwidth measurement		
Frequency range	50 MHz to 3 GHz	
Measurement level range	−50 to +30 dBm	
Measurement method		
Sweep method	Performs calculations and displays the calculation results after measurement of a target signal with the sweeping-type spectrum analyzer.	
FFT method	Performs calculations and displays the calculation results after analysis of a target signal with FFT.	

*1:Characteristic of MS268701B

Item	Specifications	Remarks
Adjacent channel leakage power measurement		
Frequency range	50 MHz to 3 GHz	
Input level range	–10 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep (all) method	Performs calculations and displays the calculation results after measurement of the target signal with the sweeping-type spectrum analyzer.	
Sweep (separate) method	Performs calculations and displays the calculation results after measurement of adjacent channel and the next adjacent channel with the sweeping-type spectrum analyzer.	
Filtering method	Measures the value of the power (rms) passed through the built-in reception filter (RRC: α = 0.22) in the adjacent channel and the next adjacent channel, and displays the measured results.	
Measurement range	Code channel 1CH: 5 MHz detuning: ≥55 dBc (typical) and 10 MHz detuning: ≥62 dBc (typical) Code channel 16CH multiplexed: 5 MHz detuning: ≥50 dBc (typical) and 10 MHz detuning: ≥60 dBc (typical) at the following Input level: ≥0 dBm, using wide dynamic range mode in filtering method Code channel 1CH: 5 MHz detuning: 55 dBc (typical) and 10MHz detuning: 62 dBc (typical) Code channel 16CH multiplexed: 5 MHz detuning: 50 dBc (typical) and 10 MHz detuning: 60 dBc (typical) at the following Input level: ≥–10 dBm, using wide dynamic range mode in filtering method	
Spurious measurement		
Measurement frequency range	9 kHz to 12.75 GHz, excluding carrier frequency ±50 MHz	
Input level range (Transmitter power)	0 to +30 dBm (average power): During Pre-Amplifier OFF	
Measurement method		
Sweep method	Detects and displays the peak value after the spectrum analyzer sweeps in a specified frequency range. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Spot method	Measures the specified frequency in the time domain on the spectrum analyzer, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Search method	Detects the peak value after the spectrum analyzer sweeps a specified frequency range, measures the frequency in the time domain, and displays the average value. The power ratio, which is the ratio to the TX power value, is calculated and displayed. (Specifications are values measured when detection mode is set to Average.).	
Measurement range	Carrier frequency: 1,800 to 2,200 MHz (excluding the spurious in the Note below) ≥79 dB (typical) (RBW: 1kHz) (9 to 150 kHz, band 0) ≥79 dB (typical) (RBW: 10kHz) (150 kHz to 30 MHz, band 0) ≥79 dB (typical) (RBW: 100kHz) (30 to 1,000 MHz, band 0) ≥76–f[GHz]dB (typical) (RBW: 1MHz) (1,000 to 3,150 MHz, band 0) ≥76 dB (typical) (RBW: 1MHz) (3,150 to 7,800 MHz, band 1) For MS2687A ≥68 dB (typical) (RBW: 1MHz) (7.9 GHz to 12.75 GHz, band 2) For MS2687B ≥74 dB (typical) (RBW: 1MHz) (7.9 GHz to 12.75 GHz, band 2) *Note:* In the carrier frequency range of 2,030.354 to 2,200MHz, spurious are generated at the following frequencies. f(spurious) = f(in) –2030.345 MHz	

Item	Specifications	Remarks
Spectrum Emission Mask Measurement	Performs Template judgment and displays the result after measurement of a target signal with the sweeping-type spectrum analyzer.	
Demodulation data Measurement	On the specified code channel, Data after reverse spreading can output up to 10 frames.	
CCDF measurement *1		
Frequency range	50 MHz to 3 GHz	
Measurement level range	–50 to +30 dBm	
Measurement method		
CCDF	Displays cumulative distribution of power difference between instantaneous power and average power.	
APD	Displays distribution of power difference between instantaneous power and average power.	
Filter selection function	20 MHz, 10 MHz, 5 MHz, 3 MHz, RRC:α = 0.22,, RC: α = 0.22	
Electrical performance (I/Q Input)	This function is available when MS2687A/B-18 is installed.	
Input method	When MS2687A/B-18 is installed: Unbalanced	
Input impedance	Selection of 1 MΩ (parallel capacitance < 100 pF) and 50 Ω is possible.	
Input level range		
Unbalance input	0.1 to 1 Vpp (at the input connector) Switching between DC coupling and AC coupling is possible.	
Measurement items	Modulation accuracy measurement, code domain power, amplitude mesurement, occupied bandwidth (FFT method) and IQ level measurement	
Modulation accuracy measurement	Input level: ≥0.1 V (rms)	
Residual vector error	<2% (rms), DC coupling, as the signal does not contain Origin Offset	
IQ level measurement		
Level measurement	Measures and displays the input voltages (rms and peak-to-peak values) for I and Q inputs, respectively.	
IQ phase difference Measurement	Measures and displays the phase difference between the I-phase signal and Q-phase signal when a CW signal is input to the I/Q Input connectors.	

*1:Characteristic of MS268701B

Section 2 Panel Layout and Operation Overview

This section describes the front and rear panels, basic operations, how to install the measurement software, change the measurement system and set the screen colors.

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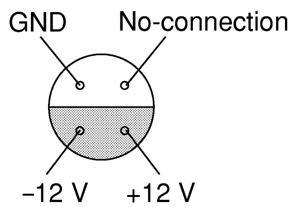
List of Controls on Front and Rear Panel

For 860x

No.	Panel Marking	Description
1	(LCD)	6.5" color TFT liquid crystal display (LCD). Displays scales trace waveforms, parameter settings, measurement values at marker points soft-key menus, etc.
2	Spectrum	Key to set this unit in the spectrum analyzer mode.
3	Tx Tester	Key to set this unit in the transmitter tester mode to execute measurement software.
4	Config	Key to set the interface to GPIB, printer, etc.
5	F1 to F6	Soft keys to select soft-key menus displayed by pressing a panel key. [More] Key to next soft-key menu page.
6	Freq/Ampl	Section to input data for the frequency and level parameters. [Freq/Channel] Sets the frequency. [Span] Sets the frequency span. [Amplitude] Sets the reference level, etc. [-> CF] Sets the peak-level signal frequency displayed on the screen as the center frequency. [-> RLV] Sets the peak-level value displayed on the screen as the reference level.
7	Marker	Section to operate the marker function. [Marker] Sets marker. [Multi Mkr] Sets multi-markers. Press this key after pressing the [Shift] key. [Peak Search] Moves the marker to peak-level point on the screen. [Marker ->] Sets a parameter using the marker value. Press this key after pressing the [Shift] key.
8	System	Key used to switch the measurement system in transmitter tester mode.
9	Single	Sets the sweep mode. [Single] Executes single sweep. [Continuous] Executes continuous sweep. Press this key after pressing the [Shift] key. The parameter is set continuous sweep after initialization.
10	Recall	Key to execute recall or save. [Recall] Reads measurement parameters and waveform data from internal memory or memory card. [Save] Saves measurement parameters and waveform data to internal memory or memory card.

No.	Panel Marking	Description
11	Measure	Key to measure the various items such as frequency, noise, adjacent channel leakage power, etc. depending on the applications.
12	Hi Power	Key to set the input connectors. MS8609A does not have this key. [Hi Power] Enables High Power input connector. [Low Power] Enables Low Power input connector.
13	Display	Section to select the trace waveform. It can display two trace waveforms in frequency domain. [A, B] Displays the trace-A or trace-B waveform of frequency domain. [A/B, A/BG] Displays the waveforms both trace-A and trace-B, or trace-A and trace-BG (background frequency including trace A). [Time] Switches to zero-span mode displaying the time domain waveforms. [A/Time] Displays the waveforms both trace-A and time-domain.
14	Trig/Gate	Key to set the trigger and gate functions. [Trig/Gate] Sets the trigger function to start sweep and gate function to control timing of writing waveform data).
15	Coupled Function	Key to set the RBW, VBW, sweep time and input attenuator.
16	Entry	Key to set numeric data, units and special functions. [Rotary knob] Used to move the marker and input data. [∨, ∧] Used to step up and down the input data. [Shift] Used to execute the function indicated with blue letters on panel key. First press this key and then press the panel key indicated with blue let ters. [BS] Backspace key to correct input errors. [0 to 9, +/−] Keys to enter numeric data. [GHz, MHz, kHz, Hz] Keys to set units of frequency, level, time, etc. [Set] Key to set parameters. [Cancel] Key to cancel an entry before setting with the [Set] key.
17	Preset	Key to reset measurement parameters to their default values.
18	Local	Key to change this unit from remote to local mode.
19	Disp On/Off	Key to set the LCD On/Off.
20	Copy	Key to output the screen hardcopy to the printer or memory card.

No.	Panel Marking	Description
21	Stby/On	Power switch. This is enabled when the Off/On switch (58) on the rear panel is On. In Stby mode, pressing and holding key approximately 1 second turns the power ON. In power On mode, pressing this key approximately 1 second turns the power Off.
22	RF Input	RF input connector
23	I/Q Input	I/Q Input connector. I and Q inputs are for Unbalance and I, $\overline{I}$ and Q, $\overline{Q}$ inputs are for Balance.)
24	Probe Power	Connector to supply ±12 V for FET probe. The pin assignments are shown below. 
25	Memory Card	Slot for a memory card that saves or loads the waveform data, measurement parameters, etc.
50	(Fan)	Cooling fan to ventilate internal heat. Leaves at least 10 cm clearance around the fan.
51	10 MHz STD	Input and output connectors for an external 10 MHz reference crystal oscillator. Inputting an external Ref In signal, automatically the unit is switched from internal external signal mode. (When an external signal is input, the internal OCXO heater is switched OFF.)
52	IF OUT	IF output connector to output band-limited IF signals.
53	Wideband IF Out	IF output connector to output band-unlimited IF signals.
54	Sweep (X)	Connector for sweep signal (X).
55	Video (Y)	Connector to output Y-axis signal in proportion to the video detection signal output. This signal is band-limited by the RBW set value and logarithmically compressed at log scale.
56	Sweep Status (Z)	Connector to output sweep status (Z).
57	Trig/Gate In (±10 V)	Connector to input external trigger/gate signal.

No.	Panel Marking	Description
58	Off/On	Power switch.
59	(Inlet)	AC power inlet to connect the power cord. It contains a time-lag fuse.
60	(Ground Terminal)	Protective ground terminal. To prevent electric shocks, connect this terminal to ground.
61	Parallel	Parallel connector to connect to printer.
62	VGA Out	VGA signal output connector
63	GPIB	GPIB interface connector for an external system controller.
64	RS-232C	RS-232C connector for an external system controller.
65	Ethernet	Ethernet 10 Base-T connector for an external system controller.
66	Name plate	Indicates the serial number and options of this unit.

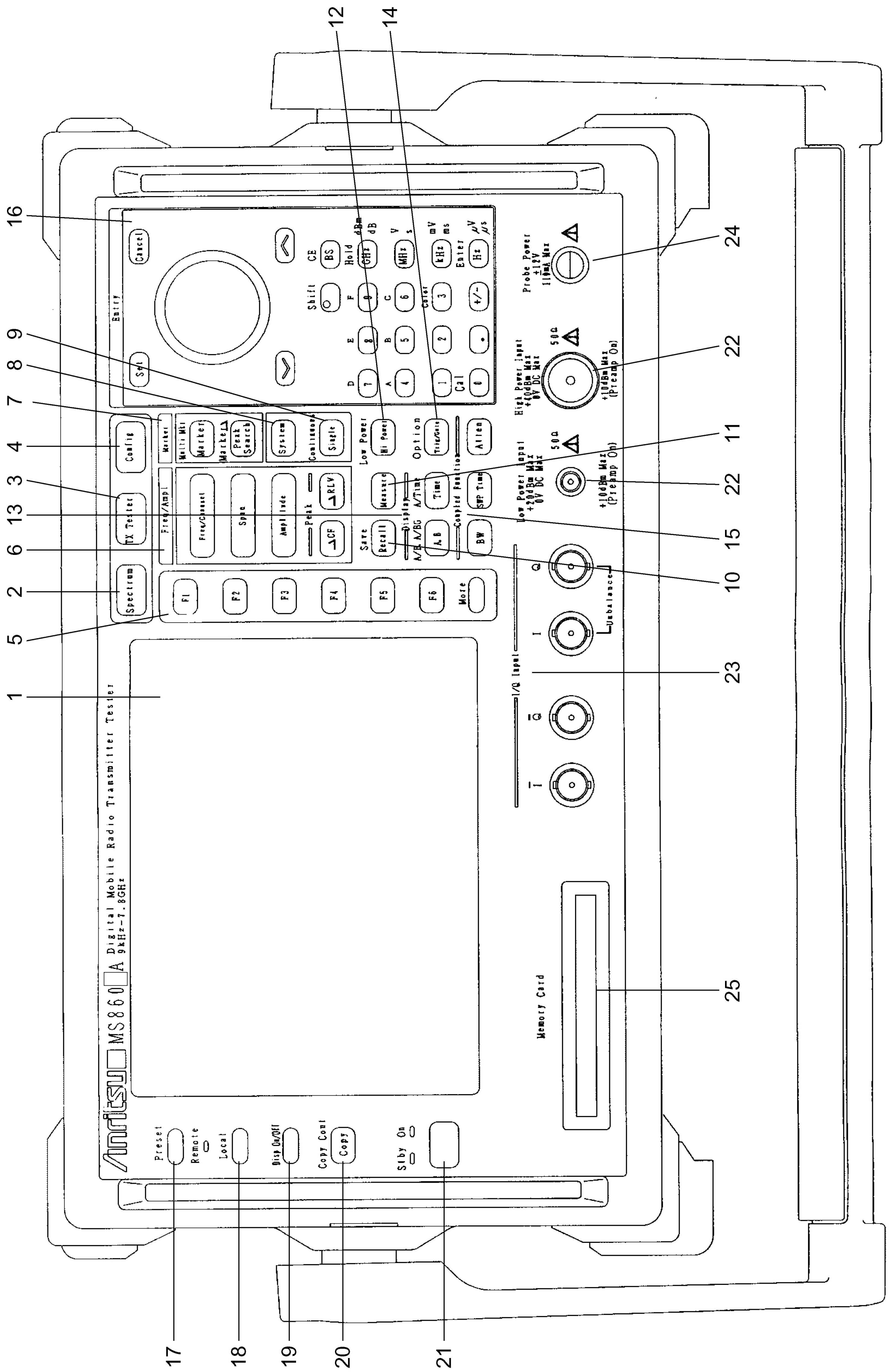


Fig.2-1 MS8608A Front Panel

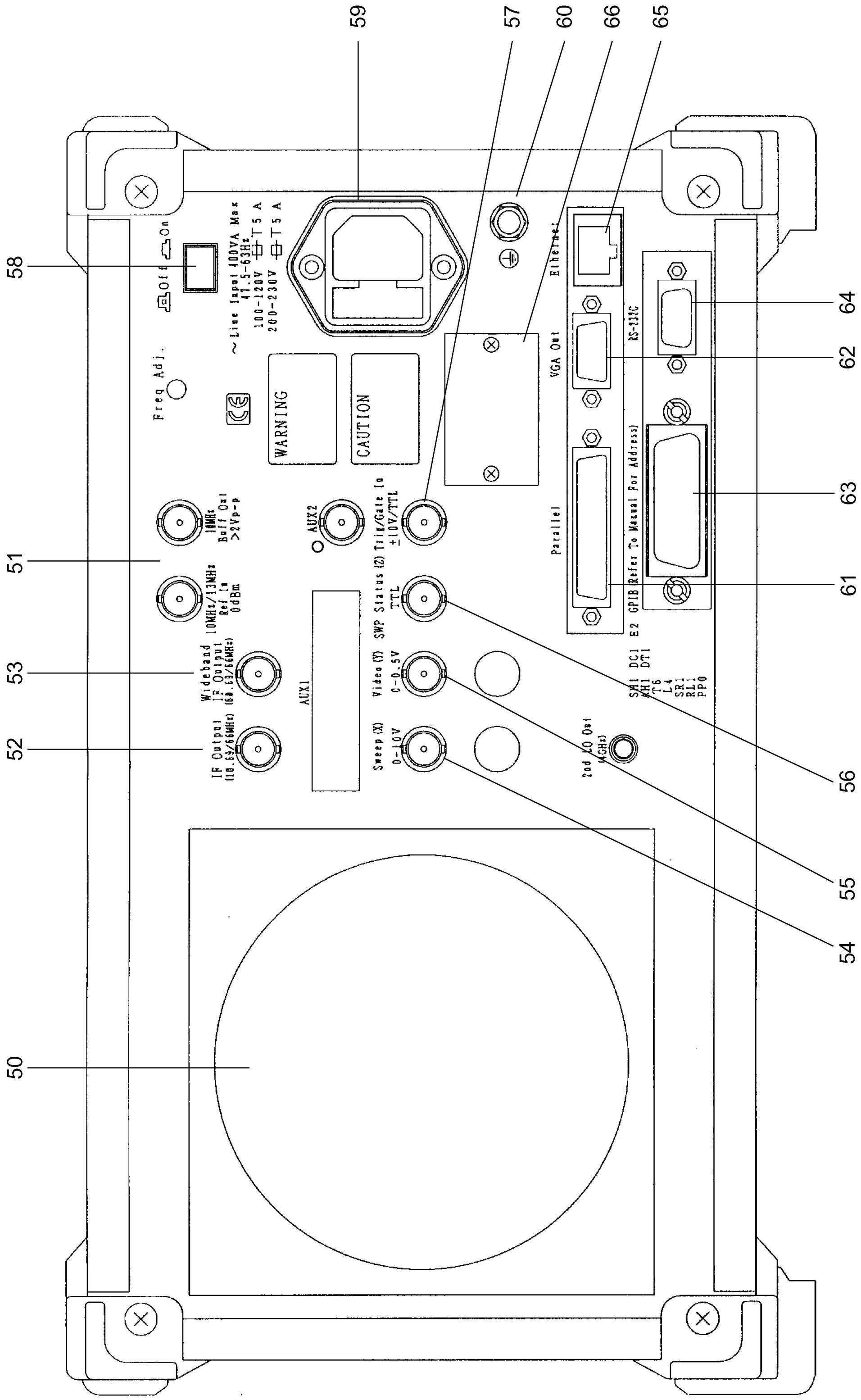


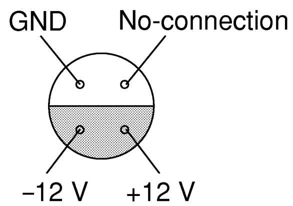
Fig.2-2 MS8608A Rear Panel

For 268x

No.	Panel Marking	Description
1	(LCD)	6.5" color TFT liquid crystal display (LCD). Displays scales trace waveforms, parameter settings, measurement values at marker points soft-key menus, etc.
2	Spectrum	Key to set this unit in the spectrum analyzer mode.
3	Signal Analyzer	Key to set this unit in the transmitter tester mode to execute measurement software.
4	Config	Key to set the interface to GPIB, printer, etc.
5	F1 to F6	Soft keys to select soft-key menus displayed by pressing a panel key [More] Key to next soft-key menu page.
6	Freq/Ampl	Section to input data for the frequency and level parameters. [Freq/Channel] Sets the frequency. [Span] Sets the frequency span. [Amplitude] Sets the reference level, etc [-> CF] Sets the peak-level signal frequency displayed on the screen as the center frequency. [-> RLV] Sets the peak-level value displayed on the screen as the reference level.
7	Marker	Section to operate the marker function. [Marker] Sets marker. [Multi Mkr] Sets multi-markers. Press this key after pressing the [Shift] key. [Peak Search] Moves the marker to peak-level point on the screen. [Marker ->] Sets a parameter using the marker value. Press this key after pressing the [Shift] key.
8	System	Key used to switch the measurement system in transmitter tester mode.
9	Single	Sets the sweep mode. [Single] Executes single sweep. [Continuous] Executes continuous sweep. Press this key after pressing the [Shift] key. The parameter is set continuous sweep after initialization.
10	Recall	Key to execute recall or save. [Recall] Reads measurement parameters and waveform data from internal memory or memory card. [Save] Saves measurement parameters and waveform data to internal memory or memory card.

No.	Panel Marking	Description
11	Measure	Key to measure the various items such as frequency, noise, adjacent channel leakage power, etc. depending on the applications.
12	Display	Section to select the trace waveform. It can display two trace waveforms in frequency domain. [A, B] Displays the trace-A or trace-B waveform of frequency domain. [A/B, A/BG] Displays the waveforms both trace-A and trace-B, or trace-A and trace-BG (background frequency including trace A). [Time] Switches to zero-span mode displaying the time domain waveforms. [A/Time] Displays the waveforms both trace-A and time-domain.
13	Trig/Gate	Key to set the trigger and gate functions. [Trig/Gate] Sets the trigger function to start sweep and gate function to control timing of writing waveform data).
14	Coupled Function	Key to set the RBW, VBW, sweep time and input attenuator.
15	Entry	Key to set numeric data, units and special functions. [Rotary knob] Used to move the marker and input data. [∨, ∧] Used to step up and down the input data. [Shift] Used to execute the function indicated with blue letters on panel key. First press this key and then press the panel key indicated with blue letters. [BS] Backspace key to correct input errors. [0 to 9, +/−] Keys to enter numeric data. [GHz, MHz, kHz, Hz] Keys to set units of frequency, level, time, etc. [Set] Key to set parameters. [Cancel] Key to cancel an entry before setting with the [Set] key.
16	Preset	Key to reset measurement parameters to their default values.
17	Local	Key to change this unit from remote to local mode.
18	Disp On/Off	Key to set the LCD On/Off.
19	Copy	Key to output the screen hardcopy to the printer or memory card.

No.	Panel Marking	Description
20	Stby/On	Power switch. This is enabled when the Off/On switch (58) on the rear panel is On. In Stby mode, pressing and holding key approximately 1 second turns the power ON. In power On mode, pressing this key approximately 1 second turns the power Off.
21	RF Input	RF input connector.
22	I/Q Input	I/Q Input connector. I and Q inputs are for Unbalance and I, $\overline{I}$ and Q, $\overline{Q}$ inputs are for Balance.)
23	Probe Power	Connector to supply ±12 V for FET probe. The pin assignments are shown below.



24	Memory Card	Slot for a memory card that saves or loads the waveform data, measurement parameters, etc.
50	(Fan)	Cooling fan to ventilate internal heat. Leaves at least 10 cm clearance around the fan.
51	10 MHz STD	Input and output connectors for an external 10 MHz reference crystal oscillator. Inputting an external Ref In signal, automatically the unit is switched from internal external signal mode. (When an external signal is input, the internal OCXO heater is switched OFF.)
52	IF OUT	IF output connector to output band-limited IF signals.
53	Wideband IF Out	IF output connector to output band-unlimited IF signals.
54	Sweep (X)	Connector for sweep signal (X).
55	Video (Y)	Connector to output Y-axis signal in proportion to the video detection signal output. This signal is band-limited by the RBW set value and logarithmically compressed at log scale.
56	Sweep Status (Z)	Connector to output sweep status (Z).
57	Trig/Gate In (±10 V)	Connector to input external trigger/gate signal.

No.	Panel Marking	Description
58	Off/On	Power switch.
59	(Inlet)	AC power inlet to connect the power cord. It contains a time-lag fuse.
60	(Ground Terminal)	Protective ground terminal. To prevent electric shocks, connect this terminal to ground.
61	Parallel	Parallel connector to connect to printer.
62	VGA Out	VGA signal output connector.
63	GPIB	GPIB interface connector for an external system controller
64	RS-232C	RS-232C connector for an external system controller.
65	Ethernet	Ethernet 10 Base-T connector for an external system controller.
66	Name plate	Indicates the serial number and options of this unit.

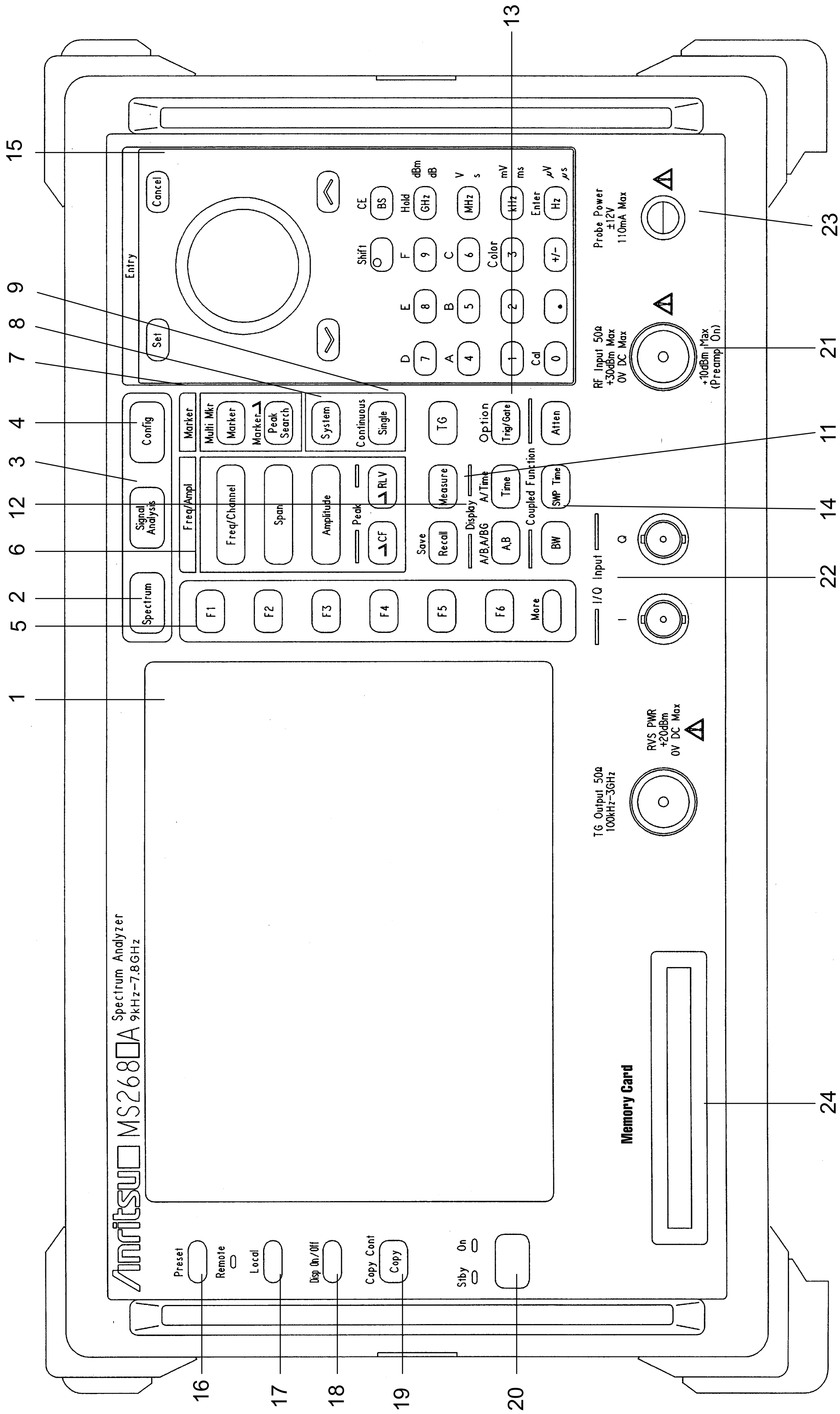


Fig.2-3 MS2681A/MS2683A/MS2687A/B Front Panel

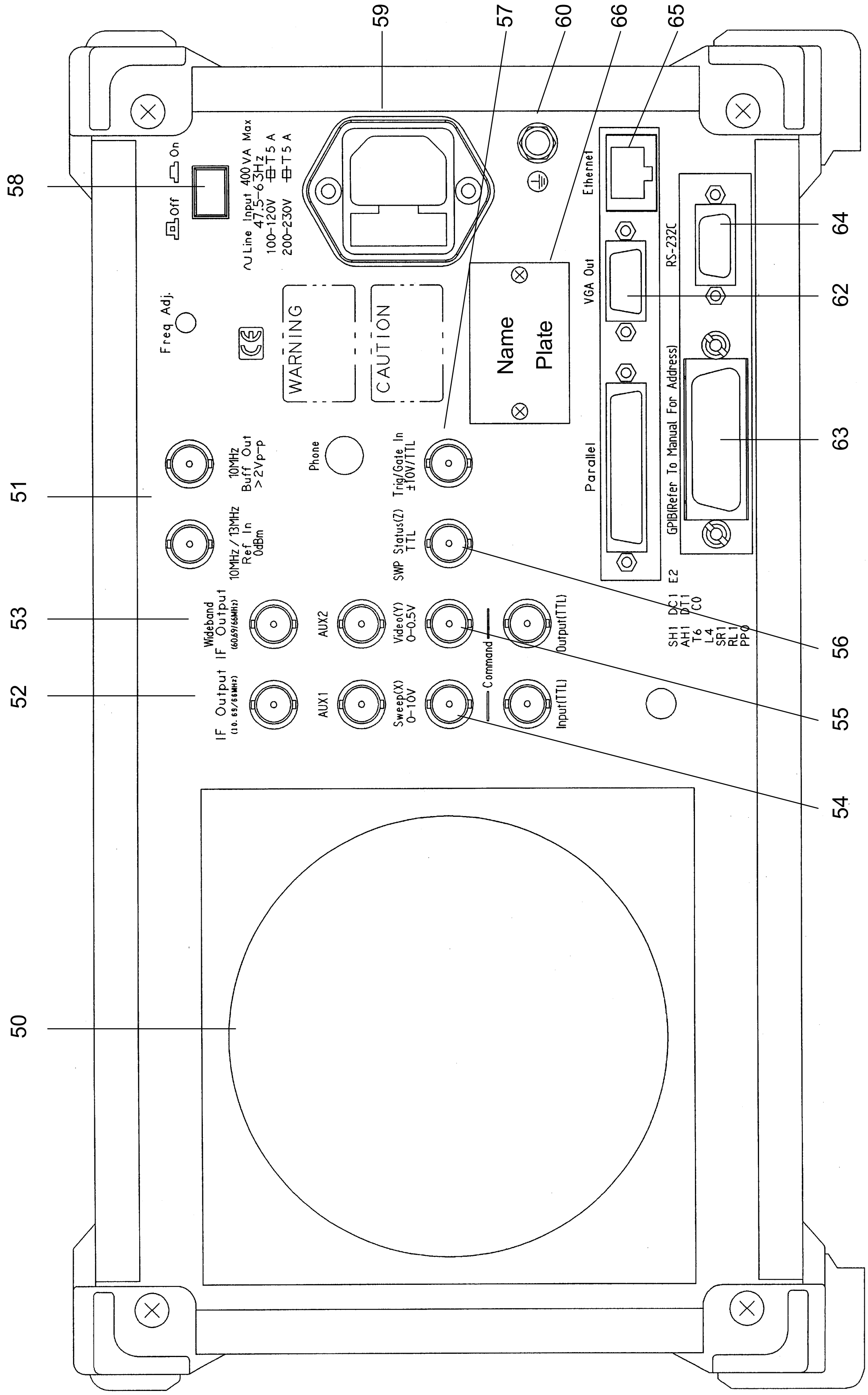


Fig.2-4 MS2681A/MS2683A/MS2687A/B Rear Panel

Basic Operation

This section describes the basic operation and typical parameter settings.

Turning the power ON

Press the Off/On switch on the rear panel and then press the Stby/On switch on the front panel for 1 second or more.

Note:

> To prevent the power from begin turned On/Off by mistake, the power is turned On/Off only after pressing the Stby/On switch for 1 second or more.

To make full use of the performance of this unit, turn on the Off/On switch on the rear panel at least 30 minutes before using it (the “Stby” power LED on the front panel goes on). It pre-heats internal reference frequency oscillator for stable unit operation.

Selecting items

Parameter for items indicated by the cursor can be changed.
Some parameters can be set after pressing the related function keys.

Setting an item indicated by the cursor

Move the cursor to the target item using [∧] and [∨] or the rotary knob in the Entry section.
Press [Set] in the Entry section to confirm the item selected.

Setting an item indicated by a function label

Press on of the [F1] to [F6] function keys and the parameter setup window opens.
Some parameters are set only by pressing the function key.

Setting parameters

After selecting an item, the parameters can be set in two ways.

(1) Selecting a parameter from those listed in the window.

(2) Entering a numeric value.

Selecting a parameter from those listed in the window

Using ∧ and ∨ or the rotary knob in the Entry section, move the cursor to the parameter to be selected.
Press Set in the Entry section to confirm selection.

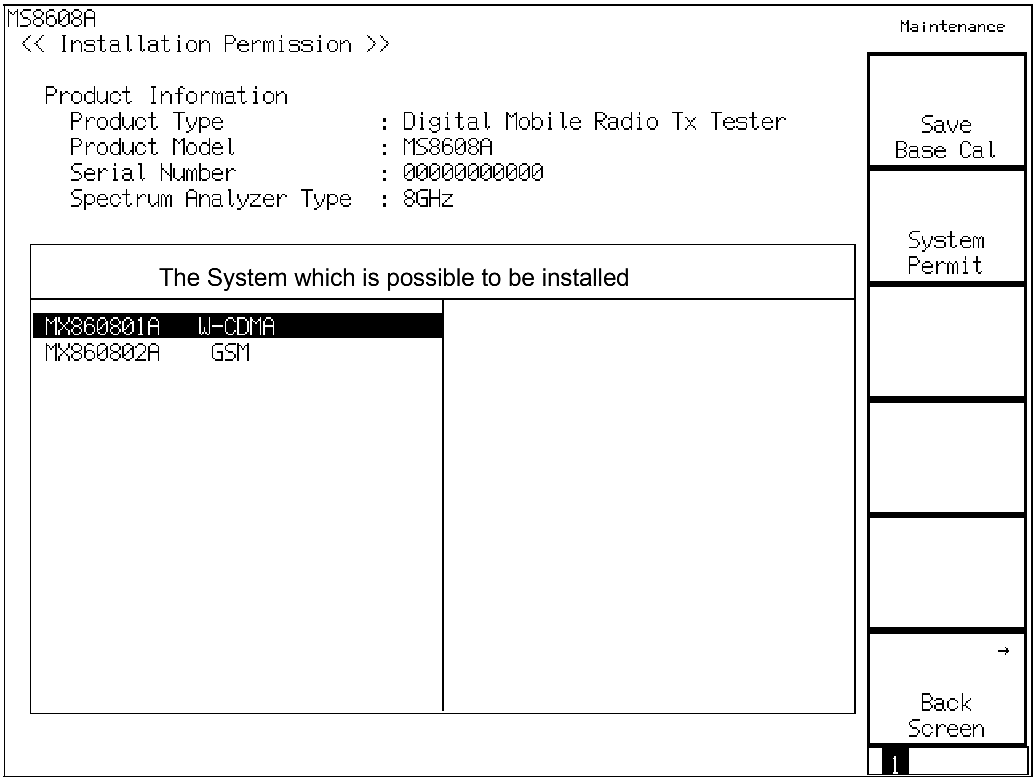
Entering a numeric value

Using the ten-key pad or the rotary knob, enter a numeric value.
Press the Unit key or Set key in the Entry section to confirm the parameter.
The window closes.

Registering the Installation Key

To install new measurement software in this unit, the installation key for the measurement system must be registered. This section describes how to register the installation key.

1. Insert the memory card containing the installation key into the memory card slot.
2. Press [Config] to display the Configuration screen.
3. Press [F2] (Maintenance Parameter) to display the Maintenance Parameter screen.
4. Press [F3] (Installation Permission) to display the Installation Permission screen shown below.



5. Press [F2] (System Permit).
6. The new measurement software is registered in the Permission table.
7. Press [F1] (Save Base Cal).

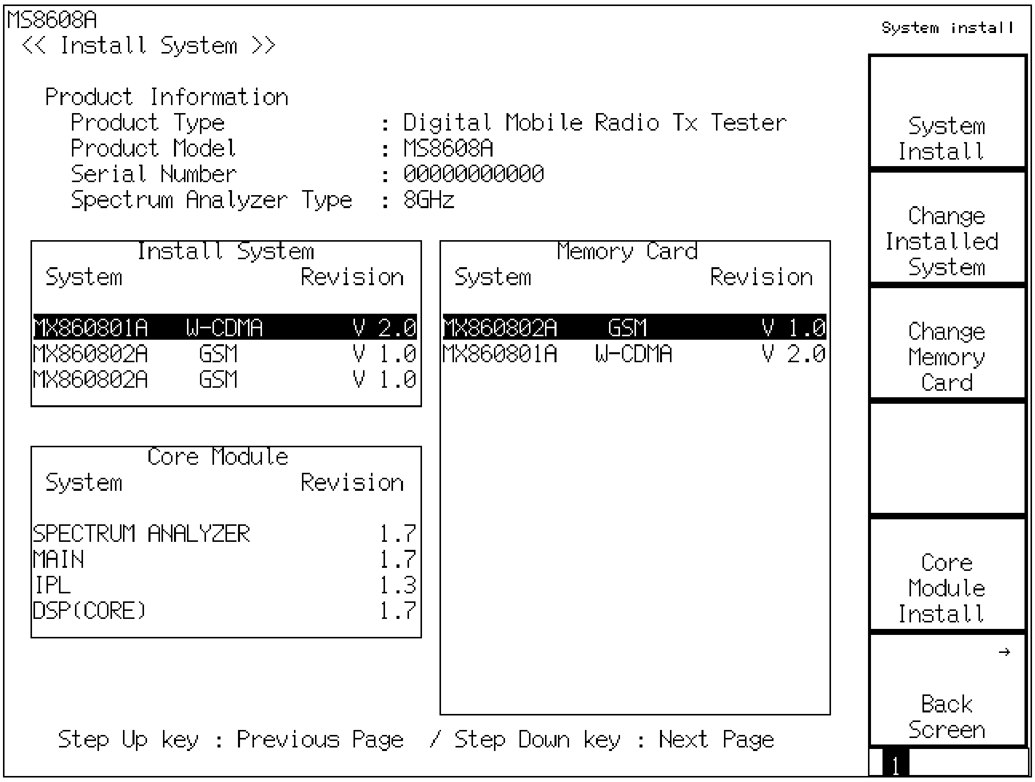
Note:

Performing Step 5 causes the installation key to be registered in the table, but it is not recorded in internal memory before performing Step 7. The installation key becomes active only after it is recorded in internal memory.

Installing Core Module Software

This section describes how to install new Core Module software in this unit.

1. Insert the memory card containing the new Core Module software into the memory card slot.
2. Press [Config] to display the Configuration screen.
3. Press [F4] (System Install) to display the Install System screen shown below.

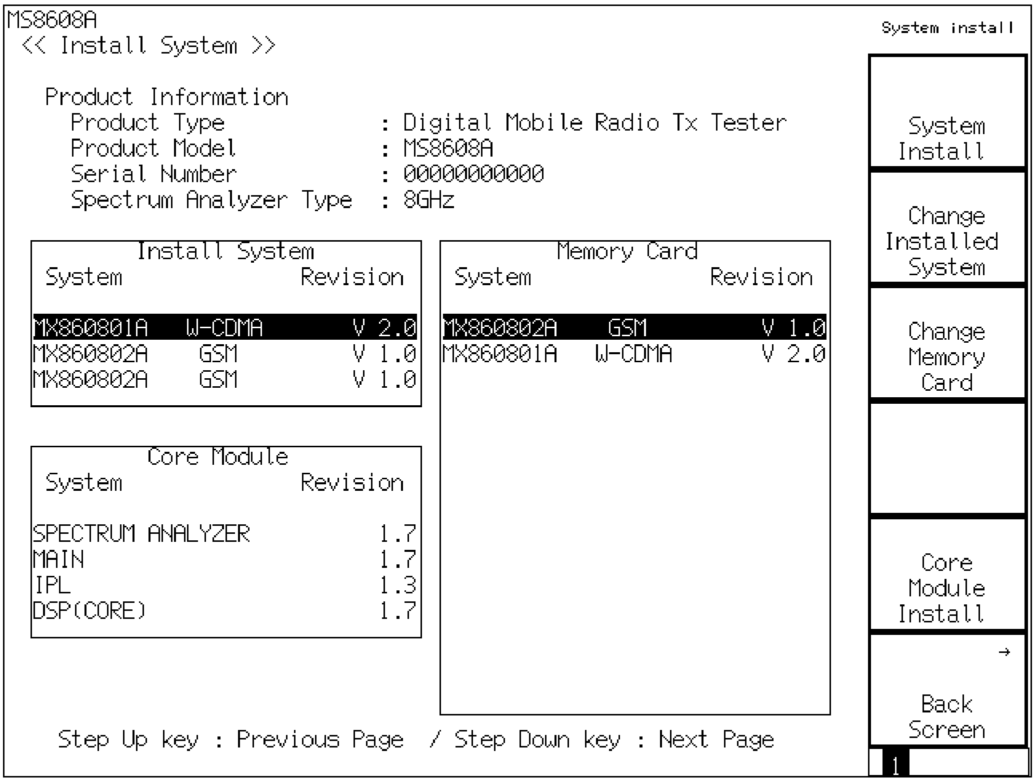


4. Press [F5] (Core Module Install).
5. The confirmation window opens. Using the rotary knob, move the cursor to Yes.
6. Press [Set] in the Entry section to start installation.
7. After installation, turn the power OFF according to the message displayed.
8. Turn the power ON while pressing [Preset]. Continue pressing [Preset] until beeping start, this is, approximately 5 seconds.

Installing Measurement Software

This section describes how to install the measurement software required to use this unit in transmitter tester mode (MS860x)/Signal analysis mode (MS268x).

1. Insert the memory card containing the measurement software to the memory card slot.
2. Press [Config] to display the Configuration screen.
3. Press [F4] (System Install) to display the Install System screen shown below.



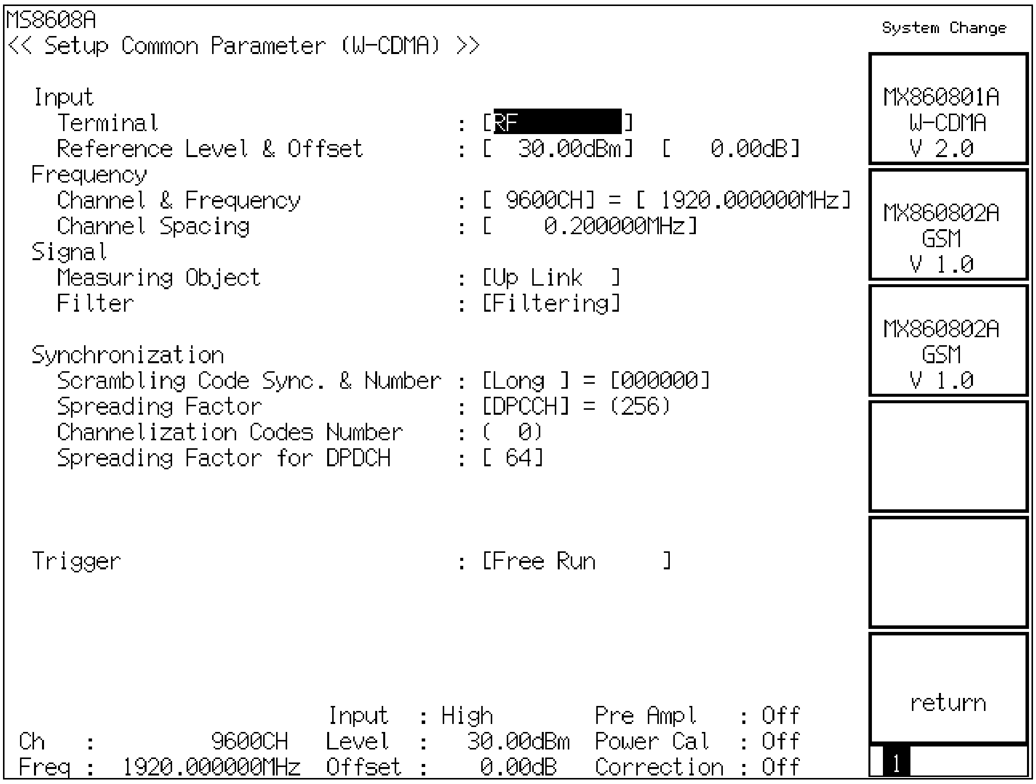
4. Press [F2] (Change Installed System) to active the Install System box.
5. Using the rotary knob, select the installation destination for the new measurement software.
6. Press [F3] (Change Memory Cord) to activate the Memory Card box.
7. Using the rotary knob, select the new measurement system.
8. Press [F1] (System Install) to install the new system.
9. The confirmation window opens. Using the rotary knob, move the cursor to Yes.
10. Press [Set] in the Entry section to start installation.

Changing the Measurement System

When there are multiple measurement software (optional) registered to use this unit in transmitter tester mode (MS860x)/Signal analysis mode (MS268x), select the measurement software to be used in the procedure in this section.

When there is only one measurement system registered, the procedure described in this section cannot be performed.

1. Press [Tx Tester](MX860x),[Signal Analysis] (MS268x) to display the measurement system screen.
2. Press [System] to display the System Change function labels shown below.



3. The installed measurement systems are listed at the function labels.
4. Press the function key to set the desired measurement system.
5. Changing of the measurement system is started.
6. When the measurement system is changed, a new system screen appears.

Measurement system not listed at function labels cannot be selected. For procedures in installing a new measurement system, refer to “Installing Measurement Software.”

Setting Screen Colors

The section describes how to set screen colors.

Screen colors can be selected from the four predetermined patterns or a user-defined one.

Pressing [Shift] + [3] (Color) causes the following function labels to appear. Select the desired color pattern.

- [F1] (Color Pattern 1): Sets Color Pattern 1 (default color pattern set before shipment)
- [F2] (Color Pattern 2): Sets Color Pattern 2
- [F3] (Color Pattern 3): Sets Color Pattern 3
- [F4] (Color Pattern 4): Sets Color Pattern 4
- [F5] (Define User Color): Sets the user-defined color pattern.

Setting a user-defined color pattern

Pressing [F5] (Define User Color) changes the screen colors to the user-defined color pattern and displays the function labels shown below.

- [F1] (Copy Color Ptn from): Displays the function labels to select Color Patterns 1 to 4 as the base colors for setting the user-defined color pattern.
- [F2] (Select Item): Selects item for which the display color is to be set.
- [F3] (Red): Sets the intensity of red for the item selected by Select Item.
- [F4] (Green): Sets the intensity of green for the item selected by Select Item.
- [F5] (Blue): Sets the intensity of blue for the item selected by Select Item.

Section 3 Measurement

This section provides an explanation of the parameters to be set on each screen, and instructions on setting them.

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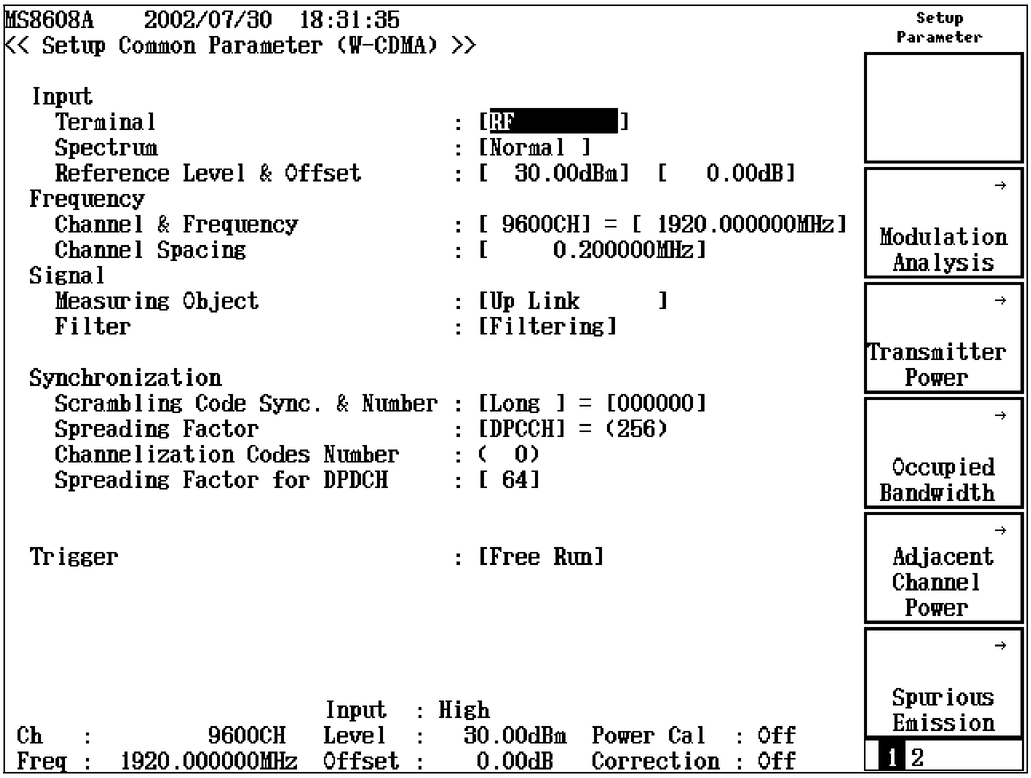
Setting Measurement Parameters

To set parameters for measurement, such as input connector and frequency; use the Setup Common Parameter screen.

Press [Tx Tester] (MS860x)/ [Signal Analysis] (MS268x) to display the Setup Common Parameter screen.

The Setup Common Parameter screen is shown below.



Setting Signal Input Connector (Terminal)

Select a connector to input signals from the DUT (Device Under Test) to be measured, as below.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to "Terminal" item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the terminal type you wish to select.
5. Press [Set] to confirm.

When the setting is completed, the selected connector (terminal) is displayed in square brackets [ ] at the right of "Terminal." item.
The following connector (terminal) settings are available.

- RF: Selects the RF Input connector.
  When the MS8608A is used, either High Power Input or Low power Input can be selected.
  Switch between the two, as follows:
  To set High Power Input, press [Hi Power].
  To set Low Power Input, press [Hi Power] while pressing down [Shift].
- IQ-DC: Selects the I/Q Input connectors.
  Uses the I/Q Input connectors classified as "Unbalance" .
  The input signal is dc-coupled to the internal circuit.
- IQ-AC: Selects the I/Q Input connector.
  Uses the I/Q Input connectors classified as "Unbalance" .
  The input signal is ac-coupled to the internal circuit.
- IQ-Balance: Selects the I/QInput connectors.
  Input the differential signals by using I and $\overline{I}$ or Q and $\overline{Q}$.

When I/Q Input is selected; "Impedance" item appears as a setting item at the right, to allow the input-impedance selection between 50 Ω and 1 MΩ. Select either one in accordance with the output impedance of the DUT.
For MS268x, IQ-DC, IQ-AC and IQ-balance inputs are available when option 17 or 18 is installed.

Setting spectrum inversion (Spectrum)

Select whether to reverse the input phase.

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to “Spectrum” item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set].

When the setting is completed, the set spectrum appears in the square brackets [ ] at the right of the “Spectrum” item.

The settings shown below are available.

- Normal: Does not reverse input phase.
- Reverse: Reverse input phase.

Setting RF Input Level (Reference Level)

Set the input level for the RF signal from the DUT to be measured, as below.

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to “Reference Level” item.
2. Press [Set] or input a value you wish to set using the numeric keypad.
3. A setting window opens.
4. Press (∧) (∨) Entry keys or turn the rotary knob, or use numeric keypad to input a value you wish to set.
5. Press [Set] to confirm.

When the setting is completed, the set level appears in the square brackets [ ] at the right of the “Reference Level” item.

When the I/Q Input connectors are selected, this setting item does not appear.

Using the Adjust Range function on the measurement screen, changes this setting to the optimum value.

Setting Level Correction Factor (Level Offset)

Set the user-defined level correction factor, as below.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to “Offset” item.
2. Press [Set] or input a value you wish to set using numeric keypad.
3. A setting window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob, or use numeric keypad to input a value you wish to set.
5. Press [Set] to confirm.

When setting is completed, the level correction factor is shown in square brackets [ ] at the right of the “Offset” item.

The value obtained from the following formula is displayed as the measured result for the RF level.

RF level displayed as measured result = Measured value + Offset

Examples:

1. The correction factor is set at −20 dB to obtain the measured result at the DUT output connector when 20 dB amplifier is inserted between the DUT and transmitter tester.
2. The correction factor is set at +10 dB to obtain the measured result at the DUT output connector when 10 dB attenuator is inserted between the DUT and transmitter tester.

When the I/Q Input connectors are selected, this setting item does not appear.

Setting Channel and Frequency (Channel & Frequency)

Set the frequency for the signal from the DUT to be measured, as below.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to Channel or Frequency.
2. Press [Set] or input a value you wish to set using numeric keypad.
3. A setting window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob, or use the numeric keypad to input a value you wish to set.
5. Press [Set] to confirm.

When setting is completed, the set value appears in square brackets [ ] at the right of the specified item.

Set the frequency spacing between channels at "Channel Spacing" item. The same procedure as that for frequency setting above is applied.

Changing the channel also changes the frequency in accordance with the frequency spacing.
However, changing the frequency does not change the channel. Accordingly, first set a channel and then set the frequency when you wish to associate the channel with the frequency.

When the I/Q Input connectors are selected, this setting item does not appear.

Setting Signal for Measuring Object (Measuring Object)

Set a target signal for measuring object, as below.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to "Measuring Object" item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set] to confirm.

When the setting is completed, a target signal for measuring object appears which is set in square brackets [ ] at the right of the "Measuring Object" item.
The following settings are available.

- Up Link: Sets the spreading signal to be transmitted by the mobile station as the measuring object. Measurement of code-multiplexed signal is also possible
- Up Link: (RACH) Sets the random access channel (RACH) of Up Link as the measuring object. Measurement of code-multiplexed signal is possible only when RACH Measurement is set on the Transmitter Power screen.
- Down Link: Sets the spreading signal to be transmitted by the base station as the measuring object. Measurement of code-multiplexed signal is also possible.
- Down Link: (Compress) Sets the compressed mode signal of Down Link as the measuring object. Measurement of code-multiplexed signal is also possible. However, Trace Format: "Code vs Time" is possible only on Modulation Analysis screen.
- QPSK: Sets 3.84 Mbps QPSK modulated signal as the measuring object. Measurement of code-multiplexed signal is not possible.

Setting Filter (Filter)

Specify whether the signal (from the DUT to be measured) should go through the RRC (Root Raised Cosine) filter, as below.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to "Filter" item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set] to confirm.

When the setting is completed, the set filtering condition appears in the square brackets [ ] at the right of the "Filter" item.
However, note that this setting is enabled only for modulation analysis, code domain analysis, and demodulated data output.
The following settings are available.

- Filtering: Analyzes the signal which has gone through the RRC filter. Select this setting for regular analysis of the RF signal.
- No Filter: Analyzes signal without filtering. Select this setting if the signal to be measured has already gone the RRC filter.

Setting Synchronization Mode (Synchronization)

Set the spreading codes (scrambling and channelization codes) etc. which are the reference for the detection and reverse-spreading signal from the DUT to be measured.

The parameter to be set for this item changes, depending on the type of the selected target signal for measurement (Measuring Object) and the selected condition of this setting item.

Here, the setting parameters and options available for each condition are explained. When QPSK is set as the Measuring Object, this item does not appear.

When the Up Link is set for Measuring Object:

```
Synchronization
  Scrambling Code Sync. & Number      :  [Long   ] = [000000]
  Spreading Factor                    :  [DPCCH] = (256)
  Channelization Code Number          :  (    0)
  Spreading Factor for DPDCH          :  [ 64]
  Slot Format for DPCCH               :  [0]
```

- Scrambling Code Sync. & Number:
  Sets the Scrambling Code used for spreading the signal to be measured.
  As Long and Short Scrambling Codes are available for the Up Link signal, set either Long or Short in the field at the left setting parameter.
  Specify the code number in the field at the right setting parameter.

- Spreading factor and other setting items:
  Sets the parameters related to Channelization Code which is the reference for reverse-spreading.
  Since DPCCH mode and Set mode are exist for setting this parameter; set either DPCCH or Set at the left field on the Spreading Factor line.
  When DPCCH mode is selected, Spreading Factor is set to 256, and Channelization Code Number is set 0. In this case, the separate Spreading Factor for DPDCH must be set. Furthermore, sets DPCCH slot format number to determine absolute phase (only for MX860x01B/MX268x01B).

```
Synchronization
  Scrambling Code Sync. & Number      :  [Long   ] = [000000]
  Spreading Factor                    :  [Set    ] = [   64]
  Channelization Code Number          :  [     1]
```

When Set mode is selected, Spreading Factor and Channelization Code Number can be set arbitrarily.

- Spreading Factor is selected among 4, 8, 16, 32, 64, 128 and 256. The same options are also available for DPDCH.
  The setting range for the Channelization Code Number is 0 to (Spreading Factor value −1)

When the Down Link is set for Measuring Object:

Synchronization

Scrambling Code Sync. & Number	:	[Set] = [000000]
Spreading Factor	:	[P-CPICH] = (256)
Channelization Code Number	:	(0)
Spreading Factor for DPCH	:	[64]

- Scrambling Code Sync. & Number:
  Sets the Scrambling Code used for spreading the signal to be measured.
  Either Set mode (for direct code setting) or Auto mode (for scrambling-code detection using SCH) can be selected to set the scrambling code for the Down Link signal.
  However, note that only the Primary Scrambling Code can be detected in Auto mode; the Secondary Scrambling Code cannot be detected.

Synchronization

Scrambling Code Sync. & Number	:	[Auto] (Using SCH)
Spreading Factor	:	[P-CPICH] = (256)
Channelization Code Number	:	(0)
Spreading Factor for DPCH	:	[64]

- Spreading Factor and other setting items:
  Sets the parameters related to the Channelization Code, which is the reference for reverse-spreading, as in the Up Link signal.
  Since P-CPICH mode and Set mode exist for setting these parameters; select either P-CPICH or Set in the field at the left setting parameter on the Spreading Factor line
  When P-CPICH mode is selected, Spreading Factor is set at 256, while Channelization Code Number is set at 0. In this case, the separate Spreading Factor for DPCH must be set.

Synchronization

Scrambling Code Sync. & Number	:	[Auto] (Using SCH)
Spreading Factor	:	[Set] = [64]
Channelization Code Number	:	[1]

When Set mode is selected, Spreading Factor and Channelization Code Number can be set arbitrarily

- Options available for Spreading Factor are 4, 8, 16, 32, 64, 128, 256 and 512. The same options are also available for DPCH.
  The setting range for the Channelization Code Number is between 0 and (Spreading Factor value − 1).

Setting Trigger (Trigger)

Set the trigger mode as below.

Setting the trigger mode

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to Trigger item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set] to confirm.

When setting is completed, the set trigger mode (shown below) appears in square brackets [ ] on the "Trigger" line.

- Free Run: Detects and measures the burst in accordance with the internal timing.
- Wide IF: Starts measures with Wide Video trigger.
- External: Measures the first burst detected starting from the point in time when an external trigger signal is first received from Trig/Gate In connector on the rear panel.

The edge and delay of the trigger signal must be set when Wide IF or External is selected as trigger mode. The trigger level must also be set for Wide IF.

Setting trigger edge

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to Trigger Edge item.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set] to confirm.

When the setting is completed, the set condition (shown below) appears in square brackets [ ] on "Trigger Edge" line.

- Rise: Synchronizes with the rising edge (of the pulse signal) of the trigger signal.
- Fall: Synchronizes with the falling edge (of the pulse signal) of the trigger signal.

Setting trigger delay

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to Trigger Delay item.
2. Press [Set] or input the value you wish to set using the numeric keypad.
3. A setting window opens.
4. Press [∧] [∨] Entry keys or turn the rotary knob, or use the numeric keypad to input the value you wish to set.
5. Press [Set] to confirm.

When the setting is completed, the set delay time appears in square brackets [ ] on the "Trigger Delay" line.

Setting trigger level

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to "Trigger Level" item.
2. Press [Set] (Entry key).
3. The selection window opens.
4. Press [∧] [∨] (Entry keys) or turn the rotary knob to move the cursor to the item you wish to select.
5. Press [Set] to confirm.

When the setting is completed, the set trigger level appears in square brackets [ ] at the right of the "Trigger Level" line.

- Low: Sets the trigger level to start measurement to "Low."
- Middle: Sets the trigger level to start measurement to "Middle."
- High: Sets the trigger level to start measurement to "High."

Setting Table for Frequency Characteristic Correction Factors (Correction)

To correct the frequency-dependent values (such as characteristics and loss of the cable for connecting the measuring object with the transmitter tester); the correction factors can be stored in the internal memory of the transmitter tester and the measured values can be displayed after adding these correction factors to the measured values.
The use of this function enables direct reading of the required measured values on the transmitter tester.

Refer to the separate "MS860x Digital Mobile Radio Transmitter Tester operation manual Vol. 2, Spectrum Analyzer Function " or "MX268x Spectrum Analyzer operation manual Vol.2, (Detailed Operating Instruction)" for more information on how to store the frequency characteristic correction factors (correction data) in the internal memory of transmitter tester/Spectrum Analyzer.

Five correction factor tables can be stored in the internal memory.
How to select a correction factor table from among the five tables internally stored, is described below.

Selecting correction factor table

1. Press [Amplitude] to display the Amplitude function label at the function keys.
2. Press [F4] (Correction) to open the window to select a correction factor table.
3. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the correction factor table you wish to select.
4. Press [Set] to confirm.

When the setting is completed, the set correction factor table is displayed in the Correction field at the lower right of the screen.

Setting Pre-Amplifier (Pre Ampl.)

This function is available when the optional MS8608A-08 or MS8609A-08/MS2681A-08/MS2683A-08 is installed.

- Setting Pre-Amplifier

1. Press [Amplitude] to display the Amplitude function label at the function keys.
2. Press [F5] (Pre Ampl.) to switch the Pre-Amplifier function On and Off.

When the setting is completed, “On” or “Off” is displayed in the Pre Ampl field at the lower right of the screen.

Analyzing Modulation Accuracy and Code Domain

Press F2 (Modulation Analysis) on the Setup Common Parameter screen to move to the Modulation Analysis screen for modulation accuracy and code domain analysis measurement.

This section explains the measured results and setting parameters shown on the Modulation Analysis screen as well as operation cautions.

Explanation of Measured Results

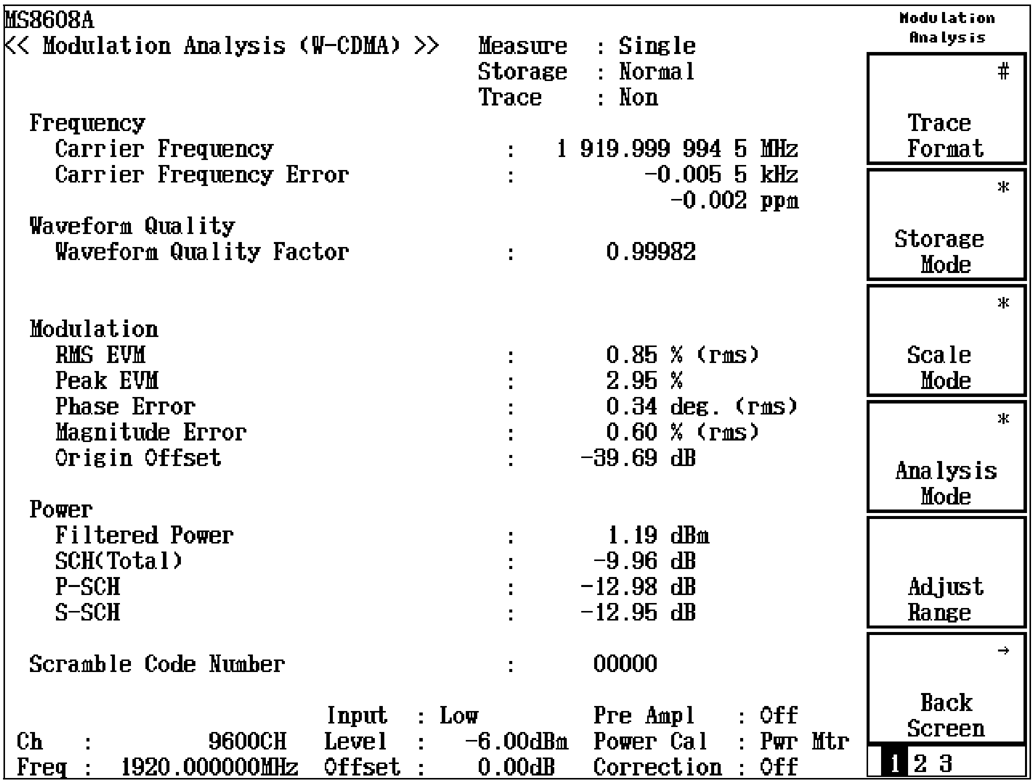
This section explains the measured results shown on the Modulation Analysis screen (modulation accuracy and code domain analysis).

Press F5 (Adjust Range) to optimize the level settings in the transmitter tester before performing the measurement. See "Optimizing Measurement Range (Adjust Range)" section for more information.

Results of modulation accuracy measurement

The screen shown below appears when Non is selected for Trace Format (Measuring Object is set to Down Link and Scrambling Code Sync. is set to Auto).

See "Changing Waveform Display Format" at the next section for more information on how to set the trace format.



Frequency

(1) Carrier Frequency

Displays the frequency of the measured signal obtained by the phase-locus method in MHz units.

(2) Carrier Frequency Error

Displays the above Carrier Frequency error against the set frequency in kHz and ppm units.

Waveform Quality

(1) Waveform Quality Factor

Displays the waveform quality factor for the measured signal. This value is obtained in accordance with IS-95 (cdmaOne) standard's definition.

Modulation

(1) RMS EVM

Displays the effective value of the error vector magnitude (in % unit) of the signal measured at the chip judgement point.

(2) Peak EVM

Displays the maximum value of the error vector magnitude (in % unit) of the signal measured at the chip judgement point.

(3) Phase Error

Displays the effective value of the phase error (in degree unit) of the signal measured at the chip judgement point.

(4) Magnitude Error

Displays the effective value of the amplitude error (in % unit) of the signal measured at the chip judgement point.

(5) Origin Offset

Displays the origin offset (carrier leakage component) of the signal measured in dB unit.

The following results are only for MX860x01B/MX268x01B.

Power

(1) Tx Power, Filtered Power

Displays the average power of measured signal in dBm. This value should be equal to the one on the Transmitter Power screen.

(2) SCH (Total)

Displays the SCH level of measured signal in dB. For details, refer to “Measuring SCH level”.

(3) P-SCH

Displays the Primary SCH level of measured signal in dB. For details, refer to “Measuring SCH level”.

(4) S-SCH

Displays the Secondary SCH level of measured signal in dB. For details, refer to “Measuring SCH level”.

Scramble Code Number

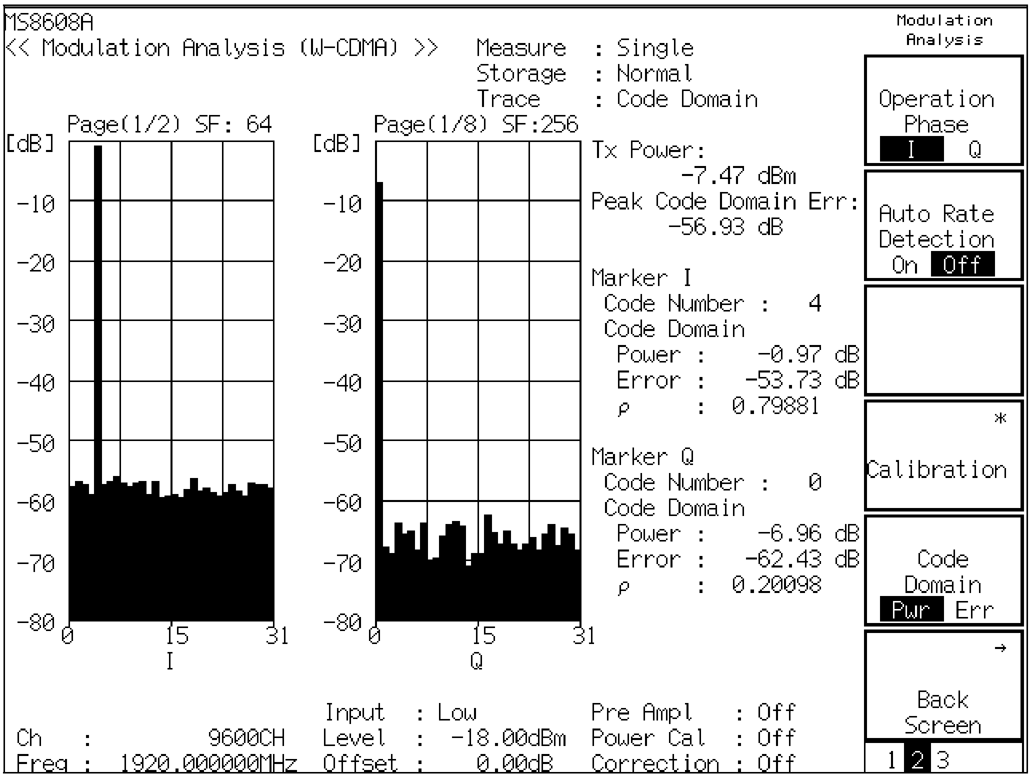
Displays the Scramble Code of measured signal.

The measured results explained are the values obtained by the analysis of the set range in Analysis Mode. See “Setting Analysis Range” for more information on how to set the Analysis Mode.

Results of code domain measurement <MX860x01A/MX268x01A>

When Measuring Object is Up Link

The screen shown below appears when Code Domain is selected for Trace Format with the Up Link set for Measuring Object in MX860x01A/MX268x01A.



Waveform display for code domain power:

With the horizontal and vertical axes representing the Channelization Code Number and relative power, respectively; the graph shows the relative power of each code component to the total transmitter power.

The SF (located at the top right of the graph) stands for the Spreading Factor (SF), and the graph shows the measured result obtained for a specified spreading factor.

As the maximum number of codes allowed to be displayed at one time is 32; the result appears on multiple pages when the SF is larger than 32.

The indication of “Page (1/8)” at the top left of the graph means that the graph currently displayed comes on the first page of eight pages.

The left and right graphs above show the measured results for Q-phase component and I-phase component, respectively.

The spreading factor setting, maker operation, and graph-page operation can be performed separately for Q and I. See “Changing Code Domain Result Display” section below for more information on how to perform these operations.

> When Set mode is selected for Spreading Factor of Synchronization item on the Setup Common Parameter screen, the Spreading Factor and the code set by Channelization Code Number are unconditionally applied to I phase.

Tx Power

Displays the average power for a single slot of measured signal in dBm unit. This value is the same as that displayed on the Transmitter Power (transmitter power measurement) screen.

Peak Code Domain Error

Displays the maximum value for the code domain error in each code of the measured signal at the spreading factor of 256.

Marker I / Marker Q

(1) Code Number

Displays the code number specified by the marker on the code domain power waveform.

(2) Code Domain Power

Displays the value for the relative power of the code specified by the marker on the code domain power waveform in dB unit.

(3) Code Domain Error

Displays the value for the code domain error of the code specified by the marker on the code domain power waveform in dB unit.

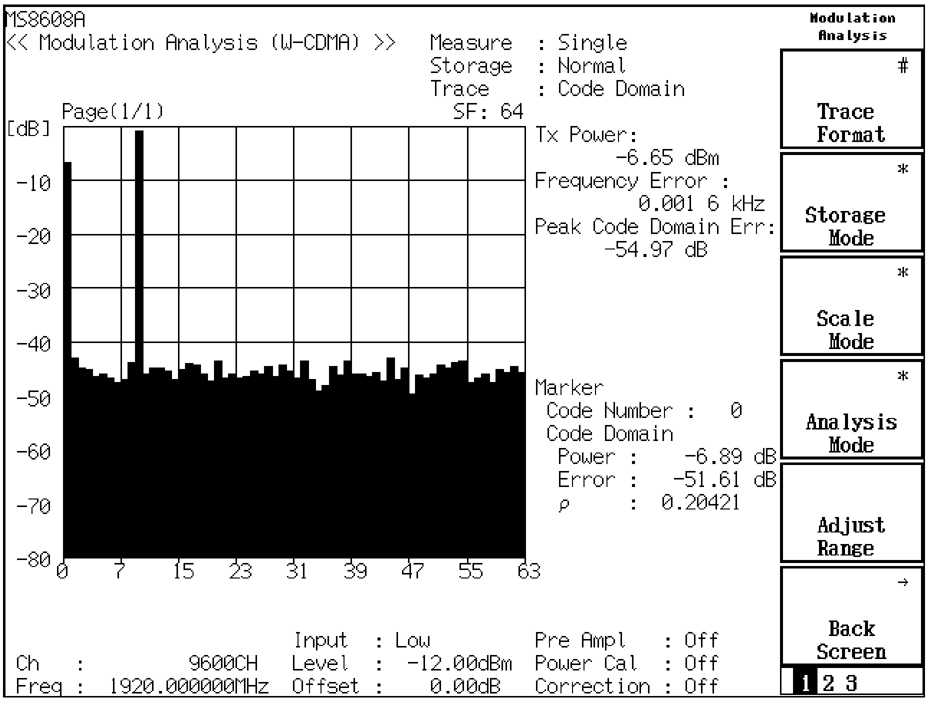
(4) ρ

Displays the waveform quality factor (ρ) of the code specified by the marker on the code domain power waveform. This value is obtained in accordance with IS-95 (cdmaOne) standard’s definitions.

Results of code domain measurement <MX860x01A/MX268x01A>

When Measuring Object is Down Link

The screen shown below appears when Code Domain is selected for Trace Format with the Down Link set for Measuring Object in MX860x01A/MX268x01A.



Waveform display for code domain power:

As with the Up Link signal, the horizontal and vertical axes represent the Channelization Code Number and relative power, respectively; and the graph shows the relative power of each code component to the total transmitter power.

The SF (located at the top right of the graph) stands for the Spreading Factor, and the graph shows the measured result obtained for the specified spreading factor.

As the maximum number of codes (allowed to be displayed at one time) is 64; the results appear on multiple pages when the SF is larger than 64.

The indication of "Page (1/1)" at the top left of the graph means that the graph currently displayed comes on the first page of a single page in total.

See "Changing Code Domain Result Display" section below for more information on how to set the spreading factor and perform operations relating to the marker and graph pages.

Tx Power

Displays the average power for a single slot of measured signal in dBm unit. This value is the same as that displayed on the Transmitter Power (transmitter power measurement) screen.

Frequency Error

Displays the frequency of the measured signal obtained by the phase-locus method, as the error to the set frequency in kHz unit.

Peak Code Domain Error

Displays the maximum value for the code domain error in each code of the measured signal at the spreading factor of 512.

Marker

(1) Code Number

Displays the code number specified by the marker on the code domain power waveform.

(2) Code Domain Power

Displays the value representing the relative power of the code specified by the marker on the code domain power waveform in dB unit.

(3) Code Domain Error

Displays the value representing the code domain error of the code specified by the marker on the code domain power waveform in dB unit.

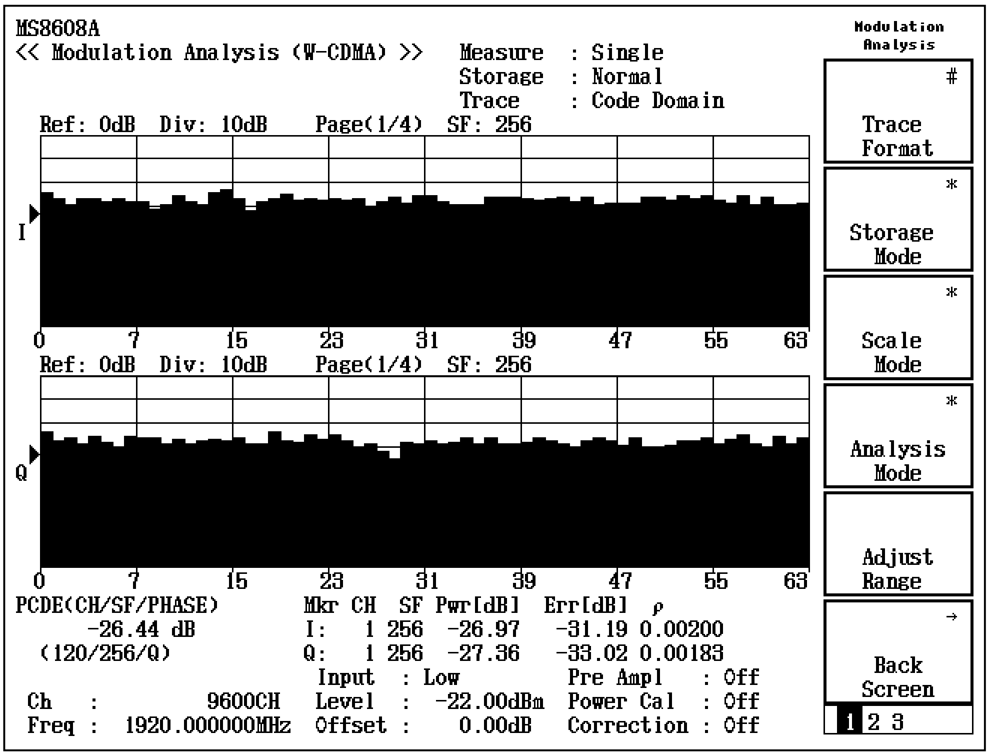
(4) ρ

Displays the waveform quality factor (ρ) of the code specified by the marker on the code domain power waveform. This value is obtained in accordance with IS-95 (cdmaOne) standard's definitions.

• Results of code domain measurement <MX860x01B/MX268x01B>

When Measuring Object is Up Link

The screen shown below appears when Code Domain is selected for Trace Format with the Up Link set for Measuring Object and setting the marker to ON in MX860x01B/MX268x01B.



Waveform display for code domain power:

With the horizontal and vertical axes representing the Channelization Code Number and relative power, respectively; the graph shows the relative power of each code component to the total transmitter power.

The SF (located at the top right of the graph) stands for the Spreading Factor (SF), and the graph shows the measured result obtained for a specified spreading factor.

As the maximum number of codes allowed to be displayed at one time is 64; the result appears on multiple pages when the SF is larger than 64.

The indication of "Page (1/4)" at the top left of the graph means that the graph currently displayed comes on the first page of four pages.

The above and below graphs above show the measured results for I-phase component and Q-phase component, respectively.

The spreading factor setting, maker operation, and graph-page operation can be performed separately for Q and I. See "Changing

Code Domain Result Display" section below for more information on how to perform these operations.

> When Set mode is selected for Spreading Factor of Synchronization item on the Setup Common Parameter screen, the Spreading Factor and the code set by Channelization Code Number are unconditionally applied to I phase.

PCDE

Displays the maximum value for the code domain error (Peak Code Domain Error) in each code of the measured signal at the spreading factor of 256. CH/SF/PHASE shows the channelization code and phase which code domain error becomes maximum at the spreading factor of 256.

Marker I / Marker Q

CH/SF displays the channelization code and spreading factor of the signal specified by the maker on the code domain power waveform.

(1) Pwr (Code Domain Power)

Displays the value for the relative power of the code specified by the marker on the code domain power waveform in dB unit.

(2) Err (Code Domain Error)

Displays the value for the code domain error of the code specified by the marker on the code domain power waveform in dB unit.

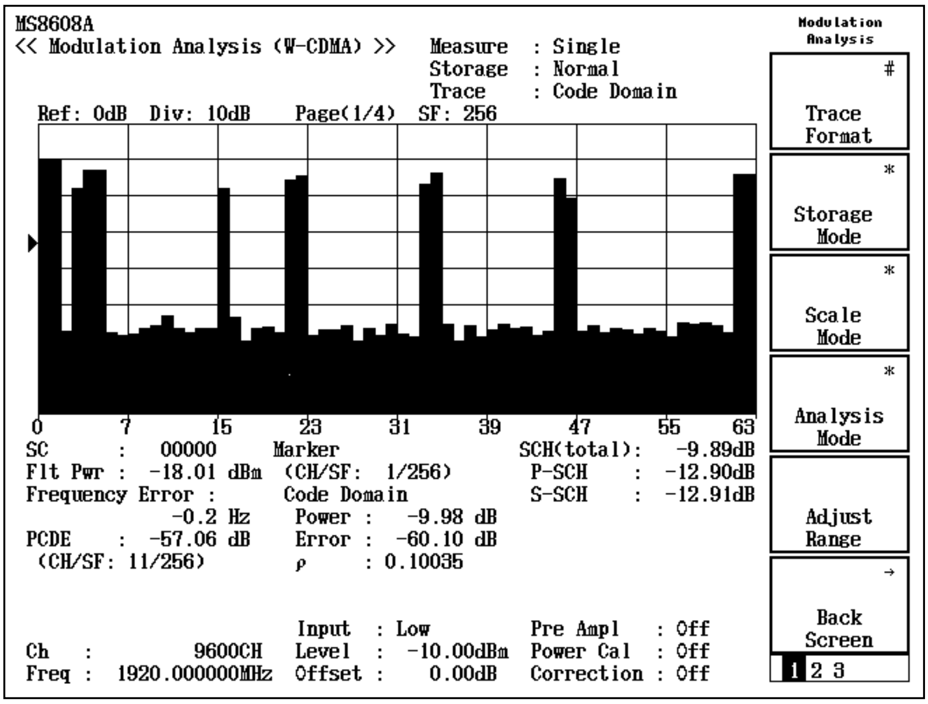
(3) ρ

Displays the waveform quality factor (ρ) of the code specified by the marker on the code domain power waveform. This value is obtained in accordance with IS-95 (cdmaOne) standard's definitions.

Results of code domain measurement <MX860x01B/MX268x01B>

When Measuring Object is Down Link

The screen shown below appears when Code Domain is selected for Trace Format with the Down Link set for Measuring Object when Scramble Code Sync. is set to Auto and setting the marker to ON in MX860x01B/MX268x01B.



Waveform display for code domain power:

As with the Up Link signal, the horizontal and vertical axes represent the Channelization Code Number and relative power, respectively; and the graph shows the relative power of each code component to the total transmitter power.

The SF (located at the top right of the graph) stands for the Spreading Factor, and the graph shows the measured result obtained for the specified spreading factor.

As the maximum number of codes (allowed to be displayed at one time) is 64; the results appear on multiple pages when the SF is larger than 64.

The indication of “Page (1/4)” at the top left of the graph means that the graph currently displayed comes on the first page of four pages in total.

See “Changing Code Domain Result Display” section below for more information on how to set the spreading factor and perform operations relating to the marker and graph pages.

SC

Displays the scramble code for the measured signal.

Flt Pwr, Tx Power

Flt Pwr: Displays the power filtered by RRC filter in dBm unit.

Tx Power: Displays the average power for a single slot of measured signal in dBm unit.

Frequency Error

Displays the carrier frequency error to the set frequency in kHz unit.

PCDE

Displays the maximum value for the code domain error (Peak Code Domain Error) in each code of the measured signal at the spreading factor of 256. CH/SF/PHASE shows the channelization code and phase which code domain error becomes maximum at the spreading factor of 256.

SCH (total)

Displays the SCH level of the measured signal in dB unit. For details, refer to “Measuring SCH level” in this section.

P-SCH

Displays the Primary SCH level of the measured signal in dB unit. For details, refer to “Measuring SCH level” in this section.

S-SCH

Displays the Secondary SCH level of the measured signal in dB unit. For details, refer to “Measuring SCH level” in this section.

Marker

(1) Code Number

Displays the code number specified by the marker on the code domain power waveform.

(2) Code Domain Power

Displays the value representing the relative power of the code specified by the marker on the code domain power waveform in dB unit.

(3) Code Domain Error

Displays the value representing the code domain error of the code specified by the marker on the code domain power waveform in dB unit.

(4) ρ

Displays the waveform quality factor (ρ) of the code specified by the marker on the code domain power waveform. This value is obtained in accordance with IS-95 (cdmaOne) standard's definitions.

Changing Waveform Display Format (Trace Format)

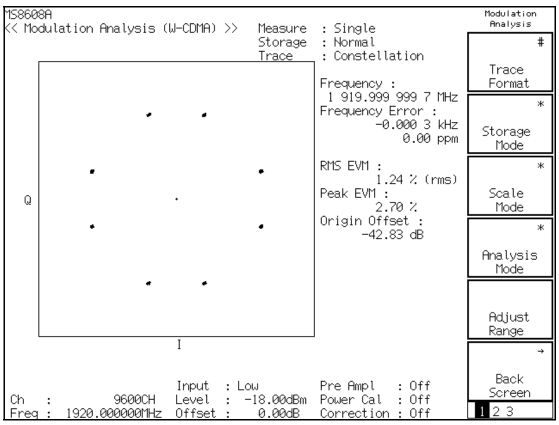
This section explains how to change the display format for waveform which appears on the screen.

Selecting the display format

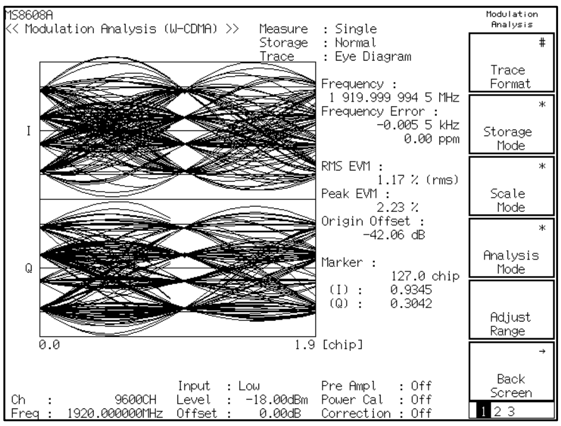
1. Press [F1] (Trace Format) on the Modulation Analysis screen.
2. A window for format selection opens.
3. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the item you wish to select.
4. Press [Set] to confirm.

After the setting is completed, the waveform displayed is switched and the format selected appears in the field showing the trace format at the top right of the screen.
The following formats are available:

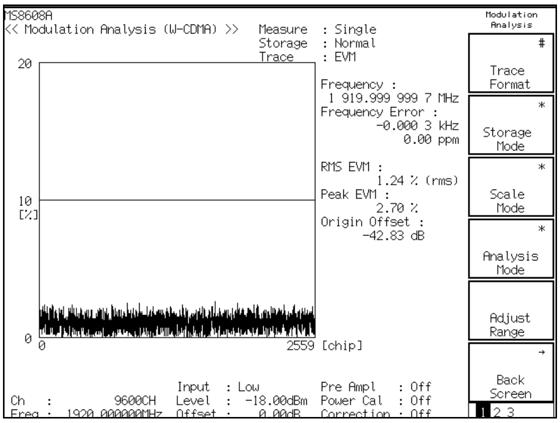
- Non: Displays numeric value results only.
- Constellation: Displays constellation.
- Eye Diagram: Displays eye diagram.
- EVM: Displays EVM vs. chip.
- Phase Error: Displays phase error vs. chip.
- Magnitude Error: Displays amplitude error vs. chip.
- Code Domain: Displays code domain power or code domain error.
- Code vs Time: Displays code power for each slot.
  This function is available only for MX860x01B/MX268x01B.



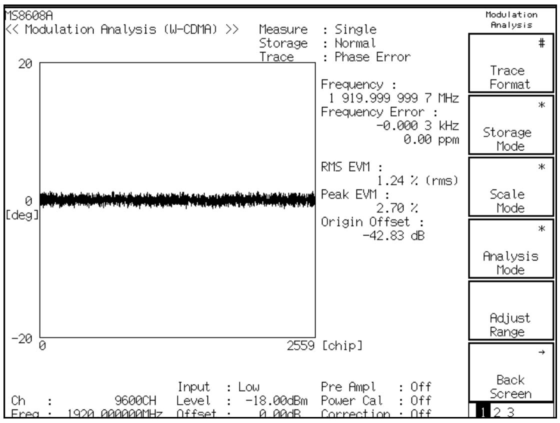
Constellation



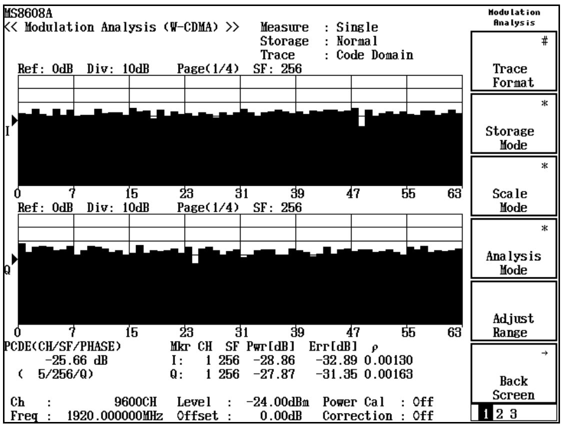
Eye diagram



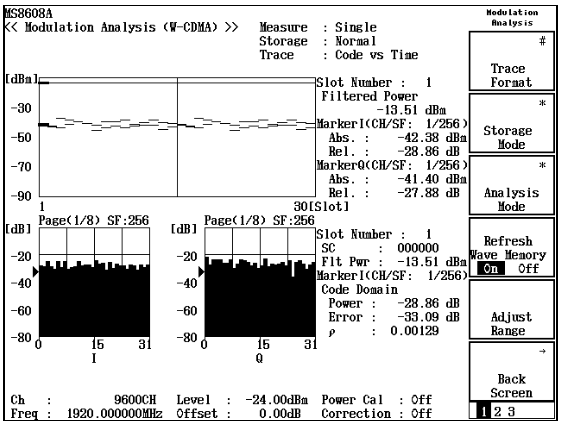
EVM vs. chip



Phase error vs. chip



Code Domain



Code vs Time

Setting Maximum Value of Spreading Factor (Max SF)

Changes the maximum value of spreading factor as below.
This is valid only when Measuring Object is set to Down Link.

Changing the maximum value of spreading factor

1. Press [ ] (More) to display the third page.
2. Press [F5] (Max SF) and select either 512 or 256.

Setting Analysis Range (Analysis Mode)

Set the waveform analysis range, as below.

Setting analysis starting position

When Measuring Object is set to other than QPSK, the frame beginning is set as the reference for the analysis start position.

1. Press [F4] (Analysis Mode) on the Modulation Analysis screen to display the Analysis Mode function labels.
2. Press [F1] (Analysis Start) to open a setting window.
3. Press [∧] [∨] Entry Keys or turn the rotary knob, or use numeric keypad to input the analysis starting position.
4. Press [Set] to confirm.

Setting analysis length

1. Press [F4] (Analysis Mode) on the Modulation Analysis screen to display the Analysis Mode function labels.
2. Press [F2] (Analysis Length) to open a setting window.
3. Press [∧] [∨] Entry Keys or turn the rotary knob, or use numeric keypad to input the analysis length.
4. Press [Set] to confirm.

When the setting is completed in either case, another measurement is made.
When no value is changed or when Cancel is selected, no measurement is made.

The analysis starting position and analysis length can be set the multiples of 256 for Up Link and the multiples of the value set to Max SF for Down Link, respectively. When a numeric value is input using numeric keypad, any excess over the multiples of 256 or the multiples of the value set to Max SF is truncated.

> The W-CDMA system must analyze the multi-rate signal. In this case unless an analysis is made in the unit of maximum chip length (maximum spreading factor) of one symbol, the correct analysis of a symbol, the correct analysis of a symbol with a fraction is not possible.

To analyze first slot of the signal including SCH, make sure to set analysis starting position to 256 and analysis length to 2304, respectively.

Setting PICH correction funtion（DTX Setup）

1. Press [F4] (Analysis Mode) on the Modulation Analysis screen to display the Analysis Mode function labels.
2. Press [F3] (Code Ch. Setup) to open the Code Ch. Setup function menu.
3 Press [F1] (DTX Setup) to alternatively swith between On and Off.

Even if PICH is contained in the measured signal, setting this function to On enables the PICH contained signal to be measured correctly. When using this funtion, PICH Channelization Code Number(PICH Channelization Code) and Timing Offset (PICH Timing Offset) need to be set.

Setting PICH Channelization Code（PICH Channelization Code）

1. Press [F4] (Analysis Mode) on the Modulation Analysis screen to display the Analysis Mode function labels.
2. Press [F3] (Code Ch. Setup) to open the function labels.
3. Press [F1] (DTX Setup) to set to On.
4. Press [F2] (PICH Channelization Code) to open the setting window.
5. Press [∧] [∨] Entry Keys, turn the rotary knob, or use the numeric keypad to enter PICH Channelization Code Number.
6. Press [Set] to confirm.

Setting PICH Timing Offset（PICH Timing Offset）

1. Press [F4] (Analysis Mode) on the Modulation Analysis screen to display the Analysis Mode function labels.
2. Press [F3] (Code Ch. Setup) to open the function labels.
3. Press [F1] (DTX Setup) to set to On.

4. Press [F3] (PICH Timing Offset) to open the setting window.
5. Press [∧] [∨] Entry Keys, turn the rotary knob, or use the numeric keypad to enter PICH Timing Offset.
6. Press [Set] to confirm.

Averaging Measured Results (Storage Mode)

This section explains the storage mode of the Modulation Accuracy and Code Domain analysis through the setting of the averaging process of the measured results.

Setting averaging process

1. Press [F2] (Storage Mode) on the Modulation Analysis screen to display the Storage Mode menu function label.
2. Press [F2] (Average Count) to open a setting window for the averaging process.
3. Press [∧] [∨] Entry keys or turn the rotary knob, or use the numeric keypad to input the number of averaging processes.
4. Press [Set] to confirm.
5. Then, press [F1] (Storage Mode) in the Storage Mode menu.
6. A mode selection window opens.
7. Press [∧] [∨] Entry keys or turn the rotary knob to select Average Mode.
8. Press [Set] to confirm.

When the setting is complated, another measurement is made.

Even when you have changed the number of averaging processes at the strage mode of Average, another measurement is made following the setting completion.

When no values are changed or Cancel is selected, no measurement is performed again.

Refresh Interval

Sets the update interval for the average value displayed, with followings.

- Every: Updates the average value display after every measurement.
- Once: Updates the average value display after the measurement is repeated by the set number of averaging processes.

Average Mode

Sets the method of capturing waveforms.

- normal: Captures waveforms and performs averaging for each measurement.
- continuous: Captures waveforms up to 150 slots, then performs averaging.

Peak Hold

Selects the calculation method for Peak Code Domain Error.

- On: Holds the peak value.
- Off: Displays average of peak value for each measurement.

Continuous Avg. Length

Sets the times of sampling the waveform data when Average Mode is set to continuous.

Average Mode, Peak Hold, Continuous Avg. Length are available only for MX860x01B/MX268x01B.

In addition to averaging (Average) the following options are available for storage Mode.

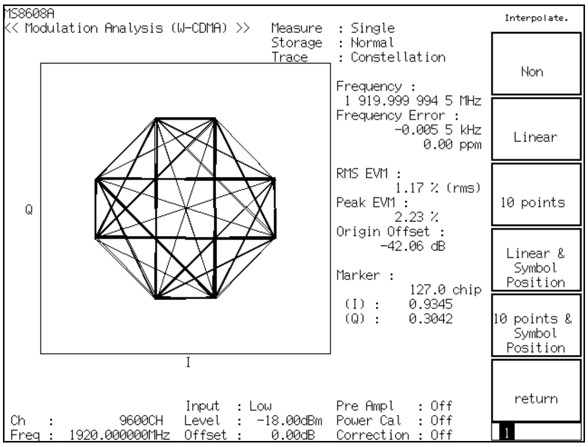
- Normal: Updates and displays the measured result after every measurement.
- Average: Averages and displays the measured result after a specified number of averaging processes.
- Overwrite: Updates the measured result after every measurements by overwriting the waveform, though no averaging is performed. However, note that when the waveform display format is set at Non or Code Domain, the waveform is not overwritten.

Changing Constellation Display (Scale Mode)

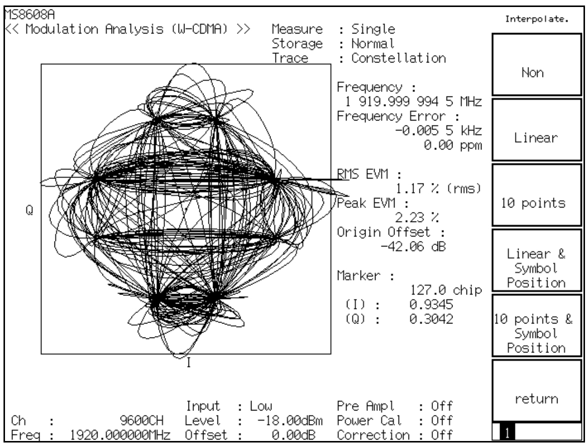
This section explains how to change the waveform display in constellation format.

Setting interpolation display of waveform

1. Press [F3] (Scale Mode) on the Modulation Analysis screen to display the Scale Mode function label.
2. Press [F1] (Interpolation) to display the following function labels to select the interpolation condition.
   - [F1] (Non): Displays a chip position with a point.
   - [F2] (Linear): Displays an interval between two chip positions with a straight line.
   - [F3] (10 points): Interpolates an interval between two chip positions using 9 point interpolation (10 times interpolation) and display each the interval with a straight line.
   - [F4] (Linear & Symbol Position): Displays a chip position with a point and an interval between two chip points with a straight line.
   - [F5] (10 points & Symbol Position): Displays a chip position with a point and performs linear-interpolation of an interval between two chip points using 9 point interpolation.
   - [F6] (return): Returns to the previous function label display.



Linear display



10 Points display

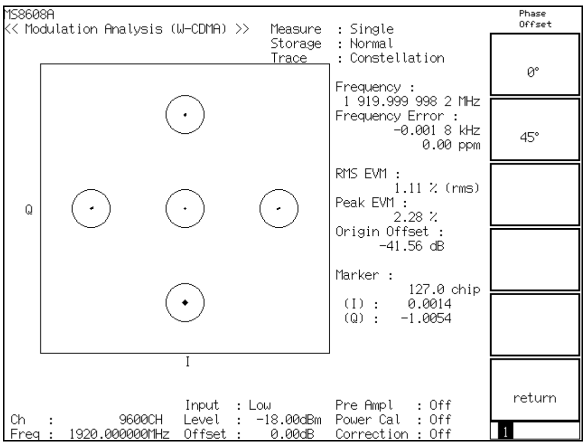
Setting error scale display

1. Press [F3] (Scale Mode) on the Modulation Analysis screen to display the Scale Mode function labels.
2. Then press [F2] (Error Scale) to display the following function labels to select an error-scale circle.
   - [F1] (5%): Displays a circle for a 5% error.
   - [F2] (10%): Displays a circle for a 10% error.
   - [F3] (20%): Displays a circle for a 20% error.
   - [F4] (OFF): Deletes a circle for an error.
   - [F6] (return): Returns to the previous function label display.

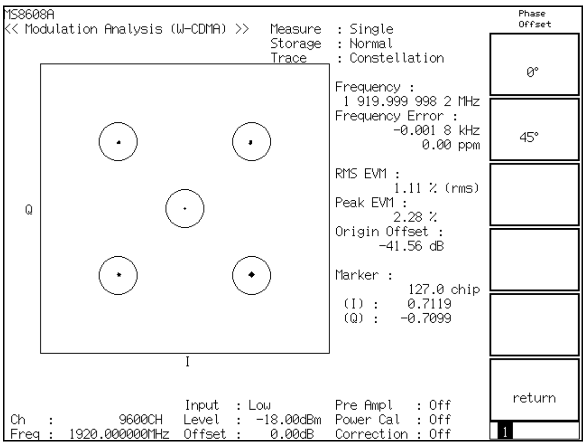
Setting phase offset

1. Press [F3] (Scale Mode) on the Modulation Analysis screen to display the Scale Mode function label.
2. Then press [F3] (Phase Offset) to display the following function labels to select a phase offset.
   - [F1] (0°): Does not rotate the waveform.
   - [F2] (45°): Displays a waveform rotated by 45° .
   - [F6] (return): Returns to the previous function label display.

The phase offset setting is enabled when the waveform display is in Constellation and Eye Diagram formats.



When the phase offset is 0°
(with Error scale display:20%)



When the phase offset is 45°
(with Error scale display:20%)

Changing Scale of Constellation (Square Scale)

This section describes how to change the scale of constellation and eye diagram waveforms. Select the scale according to intensity of multiple of signals displaying the constellation and eye diagrams of the code division multiple signals.
Note that this function is available only for MX860x01B/MX268x01B.

1. Press [F3] (Scale Mode) on the Demodulation Analysis screen to display the function label of Scale Mode.
2. Press [F4] (Square Scale) to display the following function labels. Select the desired scale.
   - [F1] (1): Sets "1" as an effective value of signal.
   - [F2] (2): Reduces the display in half.
   - [F3] (5): Reduces the display in one-fifth.
   - [F4] (10): Reduces the display in one-tenth
   - [F6] (return): Reduces the previous function label.

Changing Scale of Waveform for EVM Error (Vertical Scale)

This section explains how to change the vertical axis scale of the waveform display. The vertical axis scale of EVM error, phase error, amplitude error, and code domain waveform are available to be changed.

1. Press [F3] (Scale Mode) on the Modulation Analysis screen to display the Scale Mode menu function labels.
2. Then, press [F4] (Vertical Scale) to display the following function labels in order to select a scale.
   - [F1] (5%): Sets the maximum value of the vertical axis at 5%.
   - [F2] (10%): Sets the maximum value of the vertical axis at 10%.
   - [F3] (20%): Sets the maximum value of the vertical axis at 20%.
   - [F4] (50%): Sets the maximum value of the vertical axis at 50%.
   - [F5] (100%): Sets the maximum value of the vertical axis at 100%.
   - [F6] (return): Returns to the previous function label.

For the phase error, the same function labels are displayed except that the unit changes to deg. (degree).
In the Code Domain screen, the function labels above stand for 20/40/60/80 dB.
(For MX860x01A/MX268x01A, the selectable options are limited to 40 dB and 80 dB)

Setting calculation method of EVM (Exclude EVM Origin Offset)

Set whether the Origin Offset should be eliminated for EVM Measurement. The initial value is set to in-clude the Origin Offset that implemented in relation to 3GPP TS 34.121 5.13.1 EVM.

Note that this function is available only for MX860x01B/MX268x01B.

1. Press [ ] (more) on the Modulation Analysis screen to display the fourth page of function label.
2. Press [F1] (Exclude EVM Origin Offset) to switch the function between On and Off, alternately.

Setting Threshold of Active Channel (Threshold)

This section explains how to set a threshold to identify an active channel.

Note that this function is available only for MX860x01B/MX268x01B.

Setting threshold mode

1. Press [F3] (Scale Mode) on the Modulation Analysis screen to display the function lavel of Scale Mode.
2. Press [ ] (more) on the Modulation Analysis screen to display the second page of function label.
3. Press [F1] (Threshold Mode) to toggle between Auto and Manual.

- Auto: The active channels are automatically identified, and the modulation accuracy and the code domain are analyzed.
- Manual: The channels above the set threshold are identified as the active channel, and the modulation accuracy and the code domain are analyzed.

Setting Threshold

1 Press [F2] (Threshold) to open the setting window.

2 Enter the threshold using the rotary knob or [∧] [∨] (Entry keys).

3 Press [Set] to confirm.

The marker of the set threshold is displayed on the vertical axis of the graph on the Code Domain Power screen.

Changing Code Domain Result Display

This section explains how to change the indication of code domain measured result.
These explanations are provided on the assumption that Code Domain is selected as the waveform display format. See "Changing Waveform Display Format (Trace Format)" for more information about how to set the waveform display format.

When the Up Link is set for the Measuring Object, two graphs for phases I and Q are displayed.
Since the items shown below can be set separately for phases I and Q, the following section at first explains how to switch the graphs for phase I and Q alternately, in order to enable the settings on each graph.

Switching active graph

1. Press [ ] (More) to display the second or third page of the function label.
2. Then, press [F1] (Operation Phase) to switch the active graph between graphs for switched alternately.

Switching the displayed spreading factor

1. Press [ ] (More) to display the third page of the function label.
2. Press [F4] (Spreading factor) to open a selection window.
3. Press [∧] [∨] Entry keys or turn the rotary knob to select Spreading Factor.

When the setting is completed, SF (located at the top right of the graph) displays the set spreading factor.

Switching graph pages

1. Press [ ] (More) to display the third page of the function label.
2. Press [F2] (Previous Page) or [F3] (Next Page) to change the graph page to be displayed.
   - Previous Page: Returns to the page with the smaller code number. When the key is pressed on the first page, the last page is displayed.
   - Next Page: Moves to the page with the larger code number. When the key is pressed on the last page, the first page is displayed.

The page number is displayed in a fractional form at the top left of graph.

Timing Offset Measurement

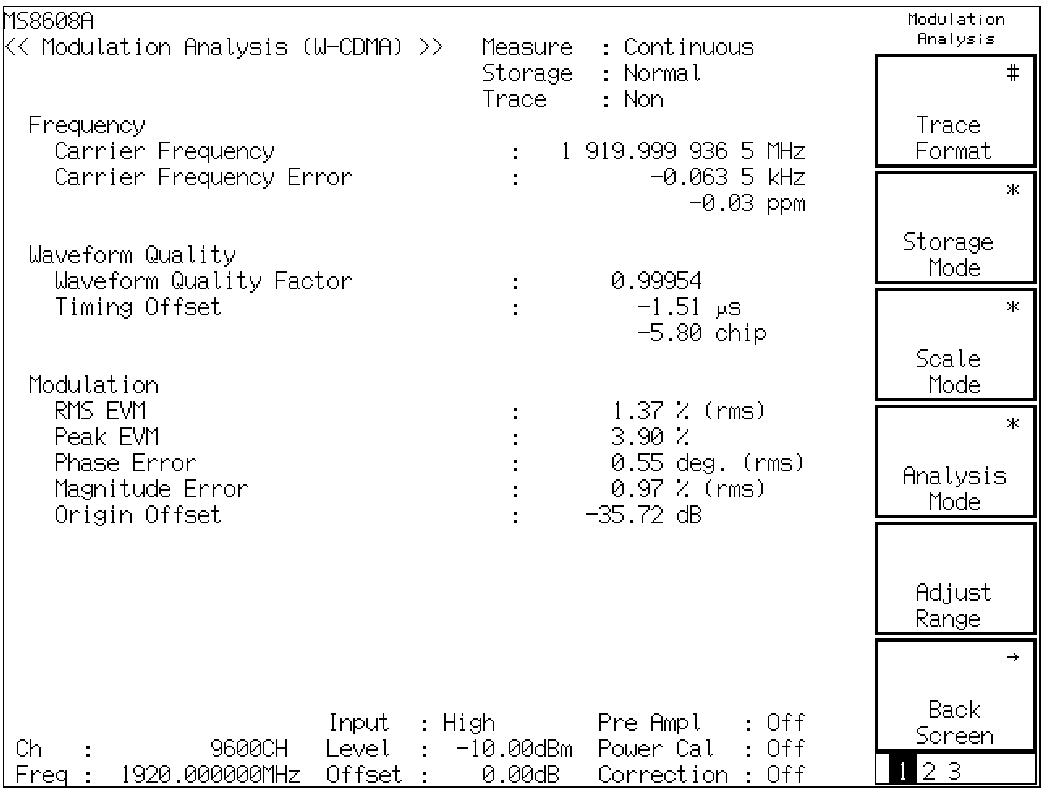
Timing Offset measurement measures the time difference between the trigger time by external trigger and the frame beginning.

For this measurement, it is necessary that trigger signal is input to the Ext Trigger connector on the rear panel and set Trigger to External on the Setup Common Parameter screen.

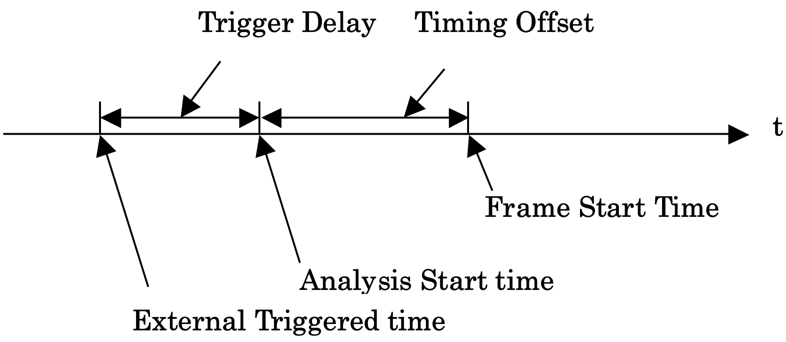
This function can also obtain the time difference between transmission diversity routes.

Explanation of the measured results

Timing Offset is added to result in the Modulation Analysis screen when this measurement is performed. The measured results for μs and chip are displayed in time and chip rate (3.84 MHz) unit, respectively.



Relationship between Timing Offset and Trigger Delay



As shown in the figure above, analysis starts at the Trigger Delay time added to the trigger time for external trigger (Analysis Start Time) to find the top of the scrambling code, the start time of the frame (Frame Start Time), by synchronization processing. Timing Offset measurement finds the difference between Frame Start Time and Analysis Start Time.

Automatic detection function of Spreading Factor (Auto Rate Detection)

This section explains the automatic detection function of Spreading Factor (Auto Rate Detection).

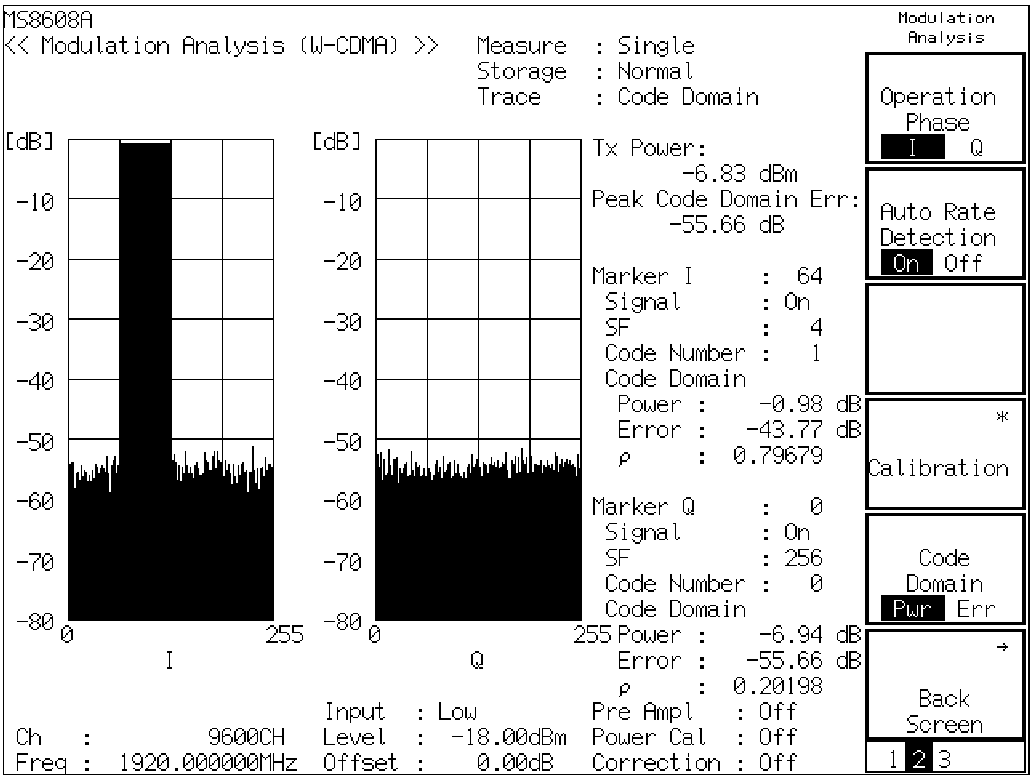
The use of this function enables more intuitive understanding of the code domain power measurement for the signals multiplexed with multiple rates. In addition, this function makes the modulation analysis of multi-rate signals to more accurate.

> Modulation accuracy can be obtained by the comparison of the measured signals with the ideal signals created from the measured signals.
> The ideal signals can be obtained by performing the reverse-spreading and demodulation of the measured signals. Therefore, in order to obtain the ideal signals for signals multiplexed at multiple rates; it is necessary to obtain the correct rate for each multiplexed signal, and then to perform the reverse-spreading and the demodulation at those rates.
> Using the automatic detection function of spreading factor makes it possible to find the rate for each multiplexed signal, and thus ensure modulation accuracy.

Setting the Synchronization on the Setup Common Parameter screen is also required even when this function is used.

Executing automatic detection function of spreading factor

1. Press [ ] (More) on the Modulation Analysis screen to display the second page of the function label.
2. Press [F2] (Auto Rate Detection) to switch the function between On and Off, alternately.



Measured results obtained when automatic detection function of spreading factor is executed

Code domain power waveform display:

With the horizontal and vertical axes representing the Channelization Code number with the spreading factor of 256 and relative power, respectively; the graph shows the relative power of each code component to the total transmitter power.

The portion judged no signal is expressed by the code number of spreading factor 256; the portion judged that signal exist is expressed by the width in accordance with the spreading factor. This means that the signal of spreading factor 16 is expressed by twice the width of the signal of spreading factor 32.

The left and right graphs above show the measured results of I-phase component and Q-phase component, respectively. The spreading factor can be set separately for I and Q. In addition, operations relating to the marker and graph pages can be done separately for Q and I. See "Changing Code Domain Result Display" for more information about how to perform operations.

Tx Power

Displays the average power for a single slot of the measured signal in dBm unit.

Peak Code Domain Error

Displays the maximum value for the code domain error in each code of the measured signal of the spreading factor 256. (In case of MX860x01B/MX268x01B, it is displayed PCDE)

Marker I / Marker Q

The number at the right of the marker represents the marker number, which is given to each code component numbered on the graph from left to right in order. During remote operation, the marker data is specified using this number. However, this is not so important for manual operation.

(1) Signal

Displays whether the signal (specified with the maker on the code domain power waveform) is On or OFF.

(2) SF

Displays the spreading factor of the signal specified with the marker on the code domain power waveform.

(3) Code Number

Displays the code number of the signal specified with the marker on the code domain power waveform.

(4) Code Domain Power

Displays the value for the relative power of the signal specified with the marker on code domain power waveform in dB unit.

(5) Code Domain Error

Displays the value for the code domain error of the signal specified with the marker on the code domain power waveform in dB unit.

(6) ρ

Displays the waveform quality factor (ρ) of the signal specified with the marker on the code domain power waveform. This value is obtained in accordance with IS-95 (cdmaOne) standard's definitions.

Measuring Code Domain Error

This section explains how to display the results of code domain error measurement.

Displaying results of code domain error measurement

1. Select Code Domain for the waveform display format.
   See "Changing Waveform Display Format (Trace Format)" for more information about how to set the waveform display format.
2. Press [ ] (More) to display the second page of the function label.
3. Press [F5] (Code Domain) to switch the waveform between the code domain power waveform and code domain error waveform, alternately.

See "Definitions of Modulation Accuracy and Code Domain Error" section, below, for more information on code domain error definition.

Displaying marker

When the waveform display format is set to other than Non, a marker can be displayed on the waveform, as below.

Displaying marker

1. Press [Marker] to display the Marker function label.
2. Press [F1] (Marker) to switch the marker between Normal and Off, alternately.

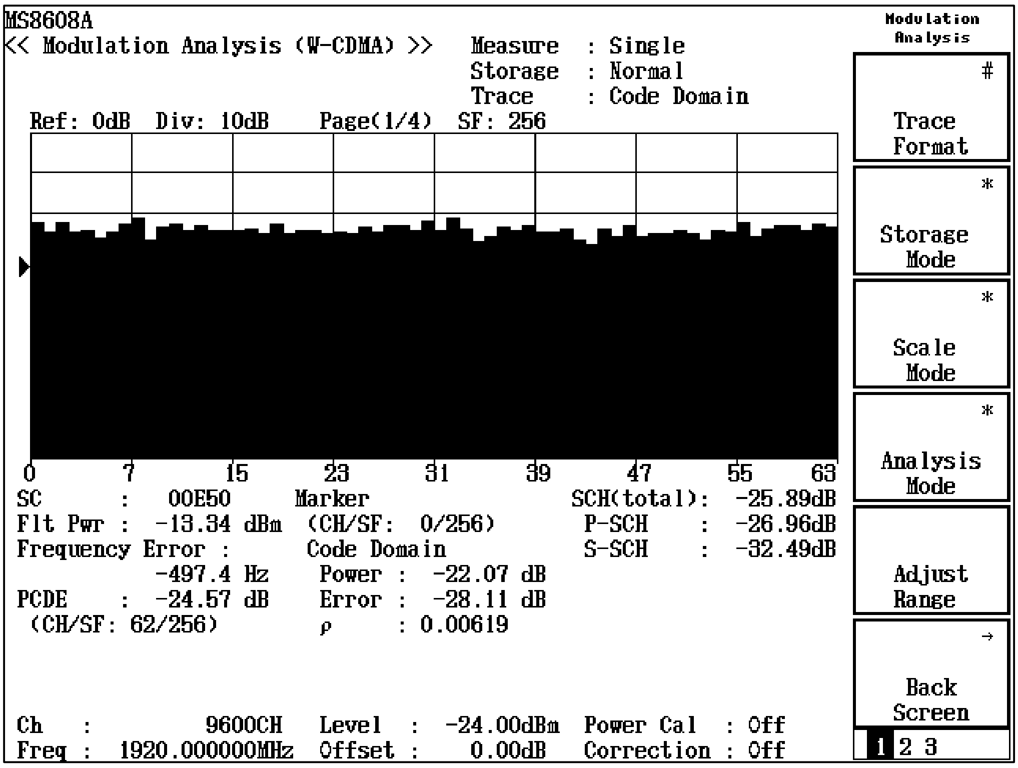
When a marker display is set at Normal, a diamond (♦) mark appears on the waveform.
When a code domain waveform is displayed, the code specified with the marker changes in color.

Measuring SCH Level

This section describes how to measure the SCH level of Down Link signal. To display the measured result, Scrambling Code Sync. & Number should be set to Auto on Setup Common Parameter screen. To display SCH Level, Trace Format should be set to Non or Code Domain. The following display appears when Code Domain is set for Trace Format.

The SCH level might vary because it is calculated by assuming the level of other code channels. When the signal consists of only SCH and P-CCPCH, the level does not vary.

Note that this function is available only for MX860x01B/MX268x01B.

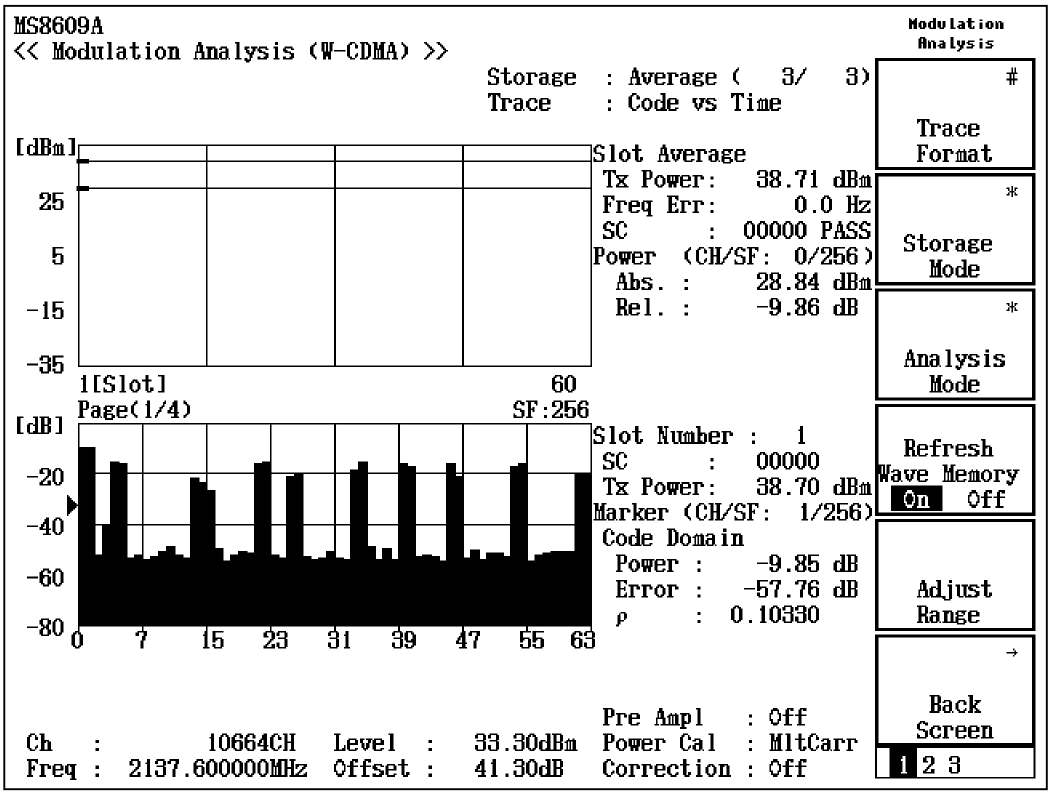


Measuring Code Power for Each Slot

This section describes how to measure code power for each slot. This function is for measuring code power of specified code channel for each slot in the continuous slot range. It enables to check some functions, such as power control of code channel and compressed mode of Down Link (Spreading Factor Reduction), efficiently.
Note that this function is available only for MX860x01B/MX268x01B.

The following explanations are given assuming that Code vs Time is selected for the waveform display format. For the setting procedure of waveform display format, refer to the section "Changing Waveform Display Format (Trace Format)"

Measured result of Code vs Time



Code vs Time Waveform (the upper graph of displayed waveform)

Displays the code channel power of specified code channel for each slot.

Slot Number

Displays the slot number indicated with marker.

SC

Displays the scramble code for the measured signal.
When Down Link is set for Measuring Object, the judgement whether scrambling code would have change or not for each frame is displayed. It is not displayed when Measuring Object is Uplink or Down Link (Compress).

Flt Pwr/Tx Power

Display the total power during the slot indicated with marker. The filter used for measurement can be change with Filter Type.

Freq Err

Displays the carrier frequency error during the slot indicated with marker.

NF Mkr (Marker)

Displays the code power of the channel code, set by the slot pointed by marker, in both absolute value and relative value. The absolute value bases on the total power of each slot. CH displays channelization code; and SF displays spreading factor. When Measuring Object is set to Down Link (Compressed), “NF Mkr” is displayed. Otherwise “Marker” is displayed.

CF Mkr:

Same function as NF Mkr. It is displayed only when Measuring Object is set to Down Link (Compressed). In this case, NF Mkr should be assigned as a code channel for Normal Frame; and CF Mkr for Compressed Frame, in order to make the checking procedure easier.

Code Domain Waveform (the lower graph of displayed waveforms)

Displays the code domain waveform at the point of set slot. The display contains the same items as the one when Trace Format is set to Code Domain.

Setting for the Code vs Waveform

This section describes the settings required for the Code vs Time waveform measurement. The explanation herein this section are given assuming that the keys for Code vs Time Setup are enable by pressing [F4] (Code vs Time Setup) after displaying the second page of function label by pressing [ ] (More) on the Demodulation Analysis screen.
Note that this function is available only for MX860x01B/MX268x01B.

Setting the Spreading Factor

1. Press [F3] (Spreading Factor) to display the setting window.
2. Select the desired spreading factor using the rotary knob or [∧] [∨] (Entry Key).
3. Press [Set] to confirm.

Sets the spreading factor of channel code that is to display Code vs Time. When Measuring Object is set to Down Link (Compressed) or Uplink, sets the spreading factor same as the one set in “Selecting the Setting Channel.”.

Setting the Channelization Code

1. Press [F4] (Channelization code) to display the setting window.
2. Enter the desired Channelization Code using the rotary knob or [∧] [∨] (Entry Key).
3. Press [Set] to confirm.

Set the Channelization Code that is to display Code vs Time. When Measuring Object is set to Down Link (Compressed) or Up Link, set the channelization code for the one set in “Selecting the Setting Channel.”

Selecting the setting channel

1. Press [F2] (Setup Channel) to toggle the setting channel. When Measuring Object is set to Down Link (Compressed), it is toggled between NF and CF; when Up Link, between I and Q.

Selecting NF enables to set the channelization code and spreading factor for the NF Marker, and CF for the CF Marker. The same rule is applied to Up Link I and Q.

Setting the Analysis Slot

1. Press [ ] (More) to display the second page of function label.
2. Press [F1] (Slot Length) to display the setting window.
3. Enter the analysis slot number using the rotary knob or [∧] [∨] (Entry Key).

Set the analysis slot (y-axis of the waveform) of the Code vs Time waveform.

Setting the y-axis of the Code vs Time waveform

1. Press [ ] (More) to display the second page of function label.
2. Press [F2] (Vertical Scale) to display the following options:

- [F1] (20dB): Sets the maximum value of y-axis scale to 20 dB
- [F2] (40dB): Sets the maximum value of y-axis scale to 40 dB
- [F3] (60dB): Sets the maximum value of y-axis scale to 60 dB
- [F4] (80dB): Sets the maximum value of y-axis scale to 80 dB
- [F6] (return): Returns to the previous function label display

The following setting items are available only when Measuring Object is set to Down Link (Compressed).

Setting the Compressed Frame Marker Mode

1. Press [ ] (More) to display the first page of function label.
2. Press [F1] (CF Marker Mode) to toggle between Auto and Manual.

Setting to Auto enables the automatic setting of channelization code and spreading factor for the CF marker according to the channelization code and spreading factor set for the NF Marker. The automatic setting conforms to the 3GPP Standard (3G TS 25.213 V4.1.0)

Setting the Scramble Code for Compressed Frame

1. Press [ ] (More) to display the first page of function label.
2. Press [F5] (Compressed Frame SC) to display the setting window.
3. Select the scramble code for the compressed frame using the rotary knob or [∧] [∨] (Entry Key).
4. Press [Set] to confirm.

Set the scrambling code of channelization code for compressed mode that is to display Code vs Time. The scramble code to be used differs according to the setting of the compressed frame marker.

When the compressed frame marker is set to Auto

- Ordinary: Uses the same scramble code as the one used for Code Synchronization.
- Alternative: Uses the scramble code that is added 8192 or 16384 to the scramble code used for Ordinary. The offset value is set according to the set spreading factor and channelization code of the code channel.

When the compressed frame marker is set to Manual

- Ordinary: Uses the same Scramble Code as the one used for Code Synchronization.
- Left Alternative: Uses the scramble code that is added 8192 to the scramble code used for Ordinary.
- Right Alternative: Uses the scramble code that is added 16384 to the scramble code used for Ordinary.

Other Functions of the Code vs Time Measurement

This section introduces other useful functions for measuring the Code vs Time waveform. The following explanations are given assuming that Trace Format is set to Code vs Time on the Demodulation Analysis screen.
Note that this function is available only for MX860x01B/MX268x01B.

Displaying the Averaging result of the data of Code vs Time (Result Type)

1. Press [ ] (More) to display the third page of function label.
2. Press [F2] (Result Type) to toggle between Normal and average.

Selecting "Normal" displays the measured result of which the marker locates; and selecting "Average" displays the averaging result between analysis slots.

Setting ON/OFF of the wave-refreshing function (Refresh Wave Memory)

1. Press [F4] (Refresh Wave Memory) to switch On and Off.

Setting to On causes the waveform data (single) to be refreshed every time the measurement is executed. Setting to Off causes the data to be analyzed without refreshing waveform data. It is enabled to measure different Code vs Time waveforms of one waveform data.
This function is unavailable when Storage Mode is set to Average.

Changing the format of waveform display (Trace View)

1. Press [ ] (More) to display the second page of function label.
2. Press [F1] (Trace View) to display the following function labels:

- [F1] (Code Domain & Code vs Time): Displays both Code Domain and Code vs Time.
- [F2] (Code vs Time): Displays Code vs Time only.
- [F3] (Code Domain): Displays Code Domain only.
- [F4] (Zoom): Enabled when only Code vs Time is displayed. Selecting Zoom In cause the area selected by the zone marker to be zoomed.
- [F5] (Unit): Toggles the numeric data display between Absolute value and relative value when Zoom In is selected.
- [F6] (return): Returns to the previous function label.

Setting the Code Domain (Code Domain Setup)

1. Press [ ] (More) to display the second page of function label.
2. Press [F5] (Code Domain Setup) to display the following function labels.

- [F1] (Scramble Code): Sets the scrambling code to be used for the code domain analysis. In the compressed mode of Down Link, different scrambling code is used only for the specified code channel. In this case, select one from Ordinaly SC (same as the scrambling code used for Synchronization), Left Alt SC (the scrambling code used for the Synchronization plus 8192), and Right Alt SC (the scrambling code used for the Synchronization plus 16384).
- [F2] (Aute Rate Detection): Refer to "Automatic Detection Function of Spreading Factor".
- [F3] (Max SF): Refer to "Setting Maximum Value of Spreading Factor".
- [F4] (Vertical Scale): Refer to "Changing Scale of EVM Error Waveform".
- [F5] (Code Domain): Refer to "Measuring Code Domain Error".
- [F6] (return): Returns to the previous function label.

3. Press [ ] (More) to display the second page of function label.

- [F1] (Operation Phase): Refer to "Changing Code Domain Result Display".
- [F2] (Spreading Factor): Refer to "Changing Code Domain Result Display".
- [F3] (Previous Page): Refer to "Changing Code Domain Result Display".
- [F4] (Next Page): Refer to "Changing Code Domain Result Display".
- [F5] (Threshold): Refer to "Changing Threshold of Active Channel (Threshold)".

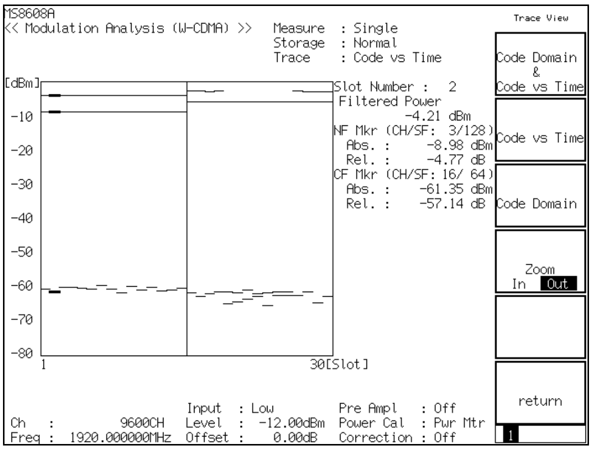
Changing the Marker Operation Trace (Operation Trace)

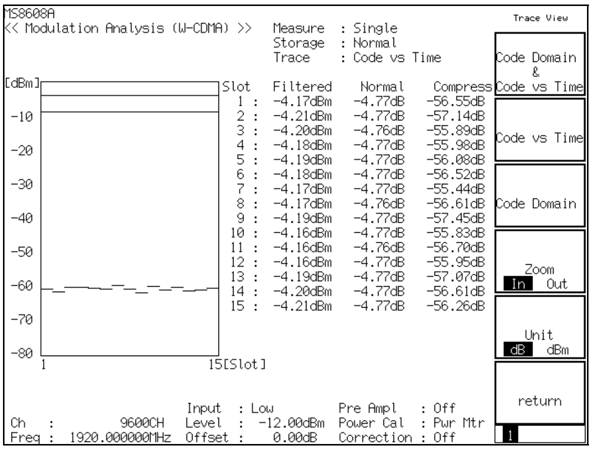
1. Press [ ] (More) to display the second page of function label.
2. Press [F3] (Operation Trace) and toggle alternately between Code vs Time and Code Domain to select the Operation Trace.

Using the Zoom Marker (Marker Type)

1. Press [Marker] to display the Marker function label.
2. Press [F2] (Marker Type) and toggle alternately between Normal and Zoom.

Zoom marker selects Code vs Time for Trace view, and is used when Zoom Out is set. Executing Zoom In enables the selected area to be zoomed.


Zoom Out


Zoom In

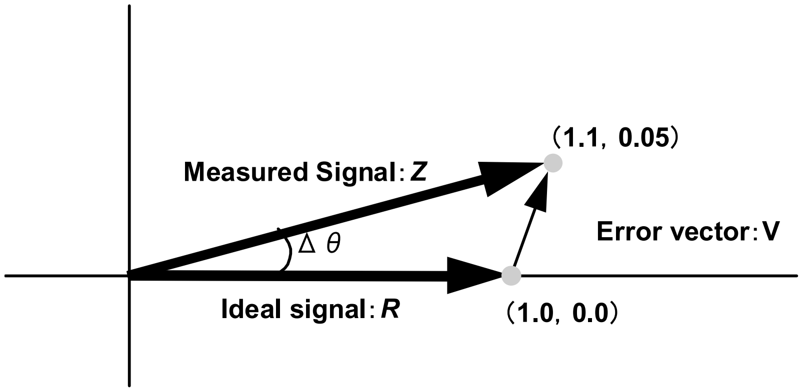
Definition of Modulation Accuracy and Code Domain Error

This section describes the definition of modulation accuracy and code domain error.

What is modulation accuracy?

Modulation accuracy expresses the extent of an error (of the digitally-modulated signal to be measured) to the ideal signal.

Measurement items include the EVM, amplitude error, phase error and origin offset. These are defined as follows.



The following section provides a brief explanation using the figure above. When the ideal signal and the measured signal are assumed to be R (1.0, 0.0) and Z (1.1, 0.05), respectively; the EVM, amplitude error, phase error and origin offset are expressed in the following formulas.

EVM:

$$V = \frac{|Z-R|}{|R|} = \frac{\sqrt{(1.1-1.0)^2+(0.05-0.0)^2}}{\sqrt{(1.0)^2+(0.0)^2}} = 0.112 = 11.2\%$$

Amplitude error:

$$M = \frac{|Z|-|R|}{|R|} = \frac{\sqrt{(1.1)^2+(0.05)^2}-\sqrt{(1.0)^2+(0.0)^2}}{\sqrt{(1.0)^2+(0.0)^2}} = 0.101 = 10.1\%$$

Phase error:

$$\Delta\theta = \theta - \theta_i = \tan^{-1}(0.05/1.1) - \tan^{-1}(0.0/1.0) = 2.60\,\mathrm{deg}$$

Each result is the value for a single point, and the rms value can be obtained by calculating the square root of the average value of square-sum of the values at all the points. The origin offset expresses the carrier-leakage component, and the amplitude is expressed in dB unit.

What are the waveform quality factor (ρ) and code domain power ?

The waveform quality factor expresses the amount of correlation between the ideal signal waveform and measured signal waveform.
The waveform quality factors are obtained for all the orthogonal codes, and they are expressed by a graph with the horizontal axis representing the code and the vertical axis representing the power ratio. The contents of this graph are called the code domain power.
Transmitter tester obtains these values in accordance with the definition of IS-95 Standard (ARIB T53 standard, cdmaOne).

However, since the spreading factor varies from 4 through 512 under the W-CDMA system, calculations are made using the spreading factor on the Setup Common Parameter screen.
The defining formula is as shown below.

$$\rho_i = \frac{\sum_j \left| \sum_k Z_{jk} R_{ijk} \right|^2}{\sum_k \left| R_{ijk} \right|^2 \sum_j \sum_k \left| Z_{jk} \right|^2}$$

Where, Z_{jk} represents the measured signal data on the 'k'th chip of 'j' symbol. On the other hand, R_{ijk} represents the ideal signal data on the 'k'th chip of 'j' symbol, which corresponding to code number i.

The following section gives a specific example of spreading with four chips.

In this case, the Channelization Codes of W-CDMA are as follows.

Code number 0:	−1,	−1,	−1,	−1
Code number 1:	−1,	−1,	1,	1
Code number 2:	−1,	1,	−1,	1
Code number 3:	−1,	1,	1,	−1

When the measured signal comprises only a signal spread with code number 1 above, the ideal signal becomes −1 −1 1 1.
If this signal changes to −1.05, −0.99, 0.9, 1.1 due to noise or other effects, the signal is reverse-spread with code number 1. The results are as follows.

Numerator:

$$\left\{(-1.05)\times(-1)+(-0.99)\times(-1)+(0.9\times 1)+(1.1\times 1)\right\}^2 = 4.04^2 = 16.3216$$

Denominator:

$$\left\{(-1)^2+(-1)^2+1^2+1^2\right\}\times\left\{(-1.05)^2+(-0.99)^2+(0.9)^2+(1.1)^2\right\} = 16.4104$$

Based on the above, a waveform quality factor of 0.9946 is obtained.

What is code domain error?

Each code component of the error vector at each chip is obtained, and then calculated to get the rms value for each chip. The rms values are called the code EVM.

The code domain error is the ratio of the square of this code EVM to the total power in dB unit.

The largest code domain error value obtained using the maximum spreading factor is defined as the peak code domain error.

Optimizing Measurement Range (Adjust Range)

Before performing a measurement, we recommend that you optimize the measurement range (Adjust Range). However, repeating optimization is unnecessary when making inputs at almost the same level.

Optimization of the measurement range automatically changes the internal level so that the internal A/D converter for analysis can be used in optimum state. This means that both the internal circuit to maximize the dynamic range (S/N) of the A/D converter, as well as the power meter range are adjusted at the same time.

To change the internal level diagram in accordance with the input level of the signal to be measured, it is necessary to input the signal to be measured when optimizing the measurement range. The Adjust Range function may not function correctly when the input signal level is showing major fluctuations.

Level measurement time given when performing Adjust Range should be as follows, according to the Measuring Object setting value:

- Up Link, Down Link, Down Link (Compressed), QPSK : 20ms
- Up Link (RACH) : 100ms

For performing Adjust Range, be sure that the signal interval is equal to or less than the level measurement time.

On the Transmitter Power screen, a function to add a 10 dB offset the optimized level is available for TPC (Transmitted Power Control) measurement. Be sure to set this 10 dB offset for the TPC measurement.

Note that this measurement range optimization cannot be executed during I/Q Inputs.

Power Calibration Function (Power Calibration)

For MS860x, transmitter tester comes with the power calibration function using the built-in power meter to enable highly accurate level measurement. We recommend that you perform this power calibration at level measurement.

In a thermally stable environment, it is not necessary to execute this function often. However, when the measurement frequency has changed significantly, it is best to calibrate again.

This power calibration function compares the measured signal level value in the tester mode with the value measured by the built-in power meter, and the measured value in the tester mode is calibrated by using the value measured by the power meter. Therefore, this power calibration function must be executed while inputting the signal to be measured.

Note that the zero-point calibration of the power meter must be performed prior to the power calibration.

The measurement frequency range of transmitter tester's built-in power meter is 30 MHz to 3 GHz.

Note that the power calibration function does not work well outside this frequency range. Also note that this function cannot be executed during I/Q Inputs.

For MS268x, to increase the accuracy of level measurement, execute internal calibration in Spectrum Analyzer mode.

Refer to the separate "MS268x Spectrum Analyzer operation manual Vol.2, (Detailed Operating Instruction)" for more information.

Power Calibration Function (Multi Carr. Power Calibration)

This function enables level measurement without using built-in power meter because correction of internal signal trace is performed using built-in calibration signal.

Use this function when input signal is multi carrier. Due to the difference of measurement band between tester mode and power meter, calibration may not be performed properly when attempt of performing power calibration with power meter is made while input signal is multi carrier. For single carrier, use the power calibration with power meter on account of higher accuracy.

When option MS8609A-33 "High-accuracy power measurement" is installed:

The correction factor (frequency range: 1848 to 1995 MHz, 2105 to 2171 MHz) created at the time of shipment or calibration is used instead of using the built-in calibration signal.

The following functions become available.

- Load Multi Carr. Cal. data: Loads the correction factor from the PC card
- Write Multi Carr. Cal. data: Writes the correction factor to the PC card

Measuring Transmit Power

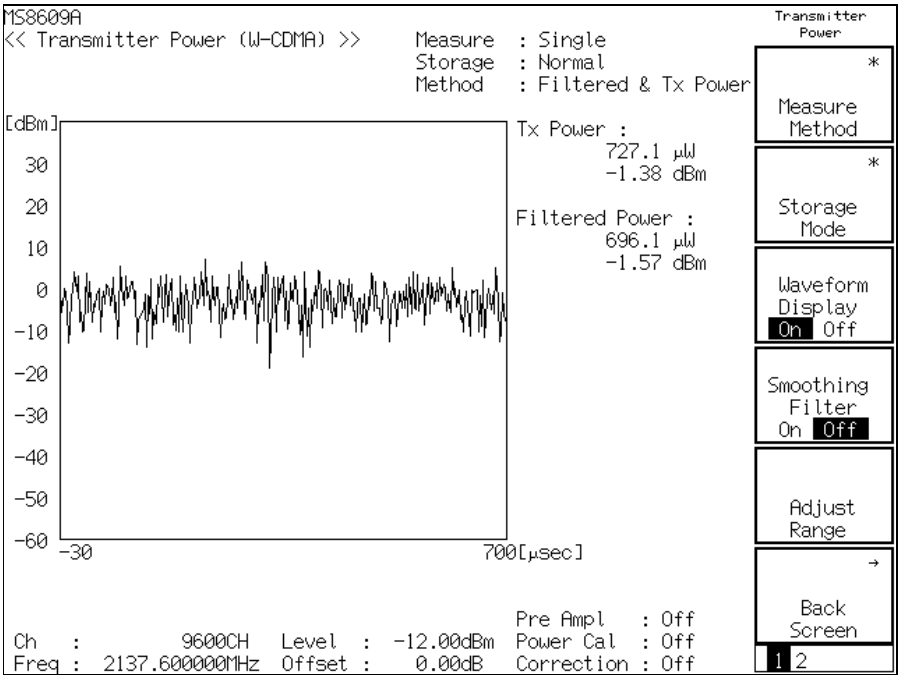
Press [F3] (Transmitter Power) on the Setup Common Parameter screen to move to the Transmitter Power measurement screen.
This section explains measured results and setting parameters shown on the Transmitter Power screen (transmitter power measurement) as well as operation warnings.

Explanation of Measured Results

This section explains the measured results shown on the Transmitter Power screen (transmitter power measurement).
Press [F5] (Adjust Range) to optimize the level setting in the transmitter tester before performing a measurement.
For MS860x, to increase the accuracy of level measurement, press [F4] (Calibration) and then press [F1] (Power Calibration) while inputting the signal, to calibrate it using the built-in power meter. For MS268x, to increase the accuracy of level measurement, execute internal calibration in Spectrum Analyzer mode. Refer to the separate “MS268x Spectrum Analyzer operation manual Vol.2, (Detailed Operating Instruction)” for more information.
See “Optimizing Measurement Range (Adjust Range)” section and “Power Calibration Function” section for more information.

Measured result

The screen shown below appears when Filtered Power & Tx Power is selected for Measure Method.



Waveform display

Display the level measurement waveform with the horizontal and vertical axes representing time and level, respectively.
Press [F3] (Waveform Display) to switch the waveform display between On and Off.

Tx Power

Displays the average power for a single slot of the measured signal in dBm and W units.

Filtered Power

Displays the average power for a single slot of the measured signal filtered through the RRC filter in dBm and W units.

Selecting result display

Press [F1] (Measure Method) on the Transmitter Power screen to display the following function labels, and select a result display.

- [F1] (Filtered Power & Tx Power): Simultaneously displays results before and after filtering.
- [F2] (Filtered Power): Displays results after filtering only.
- [F3] (Tx Power): Displays results before filtering only.
- [F4] (TPC): Moves to the Transmitter Power Control measurement screen. See "Measuring Transmitter Power Control" section for more information.
- [F6] (return): Returns to the previous function label display.

Measurement time can be reduced by selecting only a required display.
For MX860x01B/MX268x01B, button positions differ. And, a random access channel (RACH) can be measured by pushing [F3].

Performing Waveform Smoothing

This section explains the smoothing filter for a measured waveform.

Setting smoothing on/off

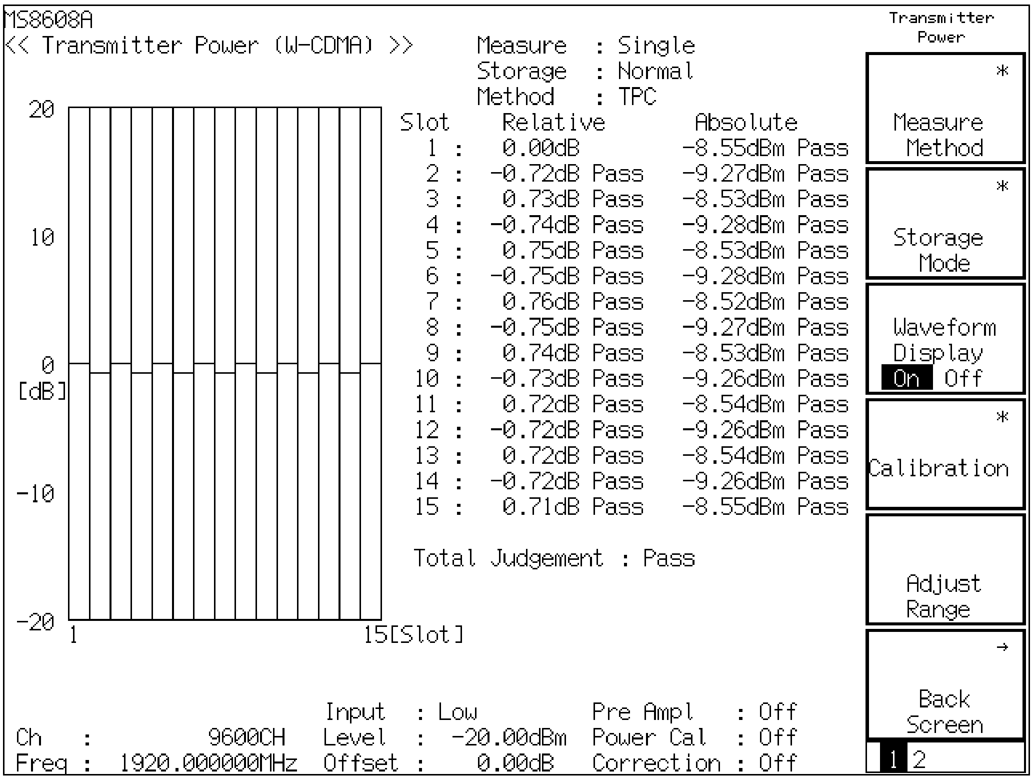
1. Press [F4] (Smoothing Filter) on the Transmitter Power screen and select whether to perform smoothing or not.

Measuring Transmitter Power Control Function <MX860x01A/MX268x01A>

This section explains how to measure the Transmitter Power Control (TPC) function. The setting of Judgement parameters enables an automatic Pass/Fail judgement.
Note that this function is available only for MX860x01A/MX268x01A.

Explanation of measured results

Press [F1] (Measure Method) on the Transmitter Power screen to display the following function labels. Then, press [F4] (TPC) to display the screen shown below.



Waveform display

Displays the level of each slot when the first slot is set as the reference (0 dB) with the horizontal and vertical axes representing the slot and level, respectively.
Press [F3] (Waveform Display) to switch the waveform display between On and Off.

Relative

Displays the amount of level change compared to that of the previous slot in dB unit.

When the measured value comes within the allowable range, the value is judged as Pass. On the other hand, when the measured value goes outside the allowable range, the value is judged as Fail.

See "Making Pass/Fail Judgement (Setup TPC)" section for more information on how to specify whether or not to make a judgement and how to set the allowable range.

Also note that the displayed waveform does not match the absolute values.

Absolute

Displays the level value of the slot in dBm unit. When the measured value comes within the allowable range, the value is judged as Pass. On the other hand, when the measured value comes outside the allowable range, the value is judged as File.

See "Making Pass/Fail Judgement (Setup TPC)" section for more information on how to specify whether or not to make a judgement and how to set the allowable range.

The displayed waveform expresses each slot level of a relative value with the first slot level of the measured value as the reference level.

Total Judgement

When both the measured relative and absolute values are judged as Pass, the transmitter power is judged as Pass. If one of the measured values is found Fail, the transmitter power is judged as Fail.

Total Judgement allows you to understand the overall result without getting information on individual judgement results.

See "Making Pass/Fail judgement (Setup TPC)" section for more information on how to specify whether or not to make a judgement and how to set the allowable range.

Displaying Marker

When the waveform display is set to On, the marker can be displayed on the waveform. However, the marker cannot be displayed when the TPC waveform is displayed.
There are two methods to display the marker, as below.

Displaying marker (Method 1)

1. Press [Marker] to display the marker function label.
2. Press [F1] (Marker) to switch the marker mode between Normal and Off.

Displaying marker (Method 2)

1. Press [ ] (More) to display the second page of the function label.
2. Press [F3] (Marker) to switch the marker mode between Normal and Off.

Setting the marker at Normal causes a diamond (♦) marker to appear on the waveform.

Averaging Measured Results (Storage Mode)

This section explains the storage mode of the transmitter power measurement through the setting of the measured-result averaging process.

Setting averaging process

1. Press [F2] (Storage Mode) on the Transmitter Power screen to display the Storage Mode function label.
2. Press [F2] (Average Count) to open the setting window.
3. Press [∧] [∨] Entry keys or turn the rotary knob, or use numeric keypad to input the number of averaging processes.
4. Press [Set] to confirm.
5. Then, press [F1] (Storage Mode) in the Storage Mode menu.
6. A selection window opens.
7. Press [∧] [∨] Entry keys or turn the rotary knob to select Average.
8. Press [Set] to confirm.

When the setting is completed, another measurement is made.
When the number of averaging processes is changed while the storage mode is set at Average, a measurement is also performed after completion of the setting. When no values are changed or when Cancel is selected, no measurements are made.

Refresh Interval:

Sets intervals for updating the average value display, as below.

- Every: Updates the display after every measurements.
- Once: Updates the display after a measurement is repeated by a set number of averaging precesses.

The following options are also available for storage mode.

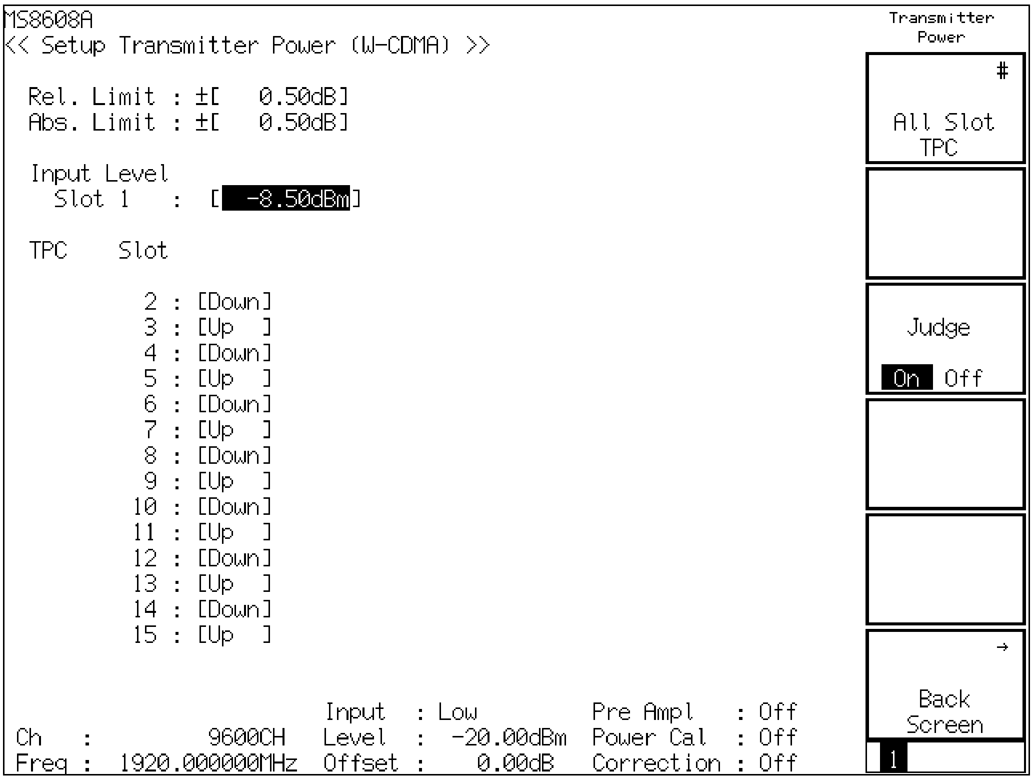
- Normal: Updates and displays measured results after every measurements.
- Average: Averages and displays the measured results after every measurements.

Making Pass/Fail Judgement (Setup TPC) <MX860x01A/MX268x01A>

This section explains how to set a Pass/Fail judgement of the Transmitter Power Control (TPC) measurement result.
Note that this function is available only for MX860x01A/MX268x01A.

Explanation of screen

Press [ ] (More) on the Transmitter Power screen to display the second page of the function label.
Then, press [F2] (Setup TPC) to display the Setup Transmitter Power screen, shown below.



Rel. Limit

Sets a threshold value to be used for a Pass/Fail judgement of the relative level for Slots 2 to 15. The same setting applies to Slot 2 through 15.

Setting procedure

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to Rel. Level item.
2. Press [Set] or input a value you wish to set using numeric keypad.
3. A setting window opens.
4. Press (∧) (∨) Entry keys or turn the rotary knob, or use numeric keypad to input a value you wish to set.
5. Press [Set] to confirm.

Abs. Limit

Sets a threshold value to be used for a Pass/Fail judgement of the absolute level for Slots 1 through 15. The same setting applies to Slot 1 through 15.

Setting procedure

1. Same as for Rel. Limit.

Input Level

Sets the absolute level for Slot 1.

Setting procedure

1. Same as for Rel. Limit.

TCP Slot

Sets the level change of each slot (Slots 2 through 15) using level up and down.

Setting procedure

1. Press (∧) (∨) Entry keys or turn the rotary knob to move the cursor to the slot you wish to set.
2. Press [Set] to open a selection window.
3. Press (∧) (∨) Entry keys or turn the rotary knob to select Up or Down.
4. Press [Set] to confirm.

Other functions

- [F1] (All Slot TPC): Makes the TPC slot setting for all the slots in a batch.
- [F3] (Judge): Specifies whether or not to make a Pass/Fail judgement (Set it On to enable judgement or set it Off to disable judgement).

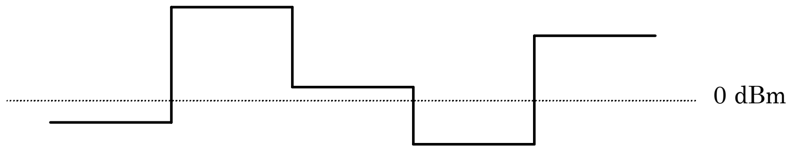
Judgement examples

This section explains how to make a Pass/Fail judment.

When the set values are as follows:

Rel. Limit: ±0.50 dB, Abs. Limit: ±0.80 dB, Input Level: 0.00 dBm

Slot 1 Slot 2 [Up] Slot 3 [Down] Slot 4 [Down] Slot 5 [Up]



Measured values : –0.3 dBm +1.3 dBm +0.2 dBm –0.6 dBm +0.9 dBm

Assume that the above measured values are obtained.
In this case, the judgement results are as follows.

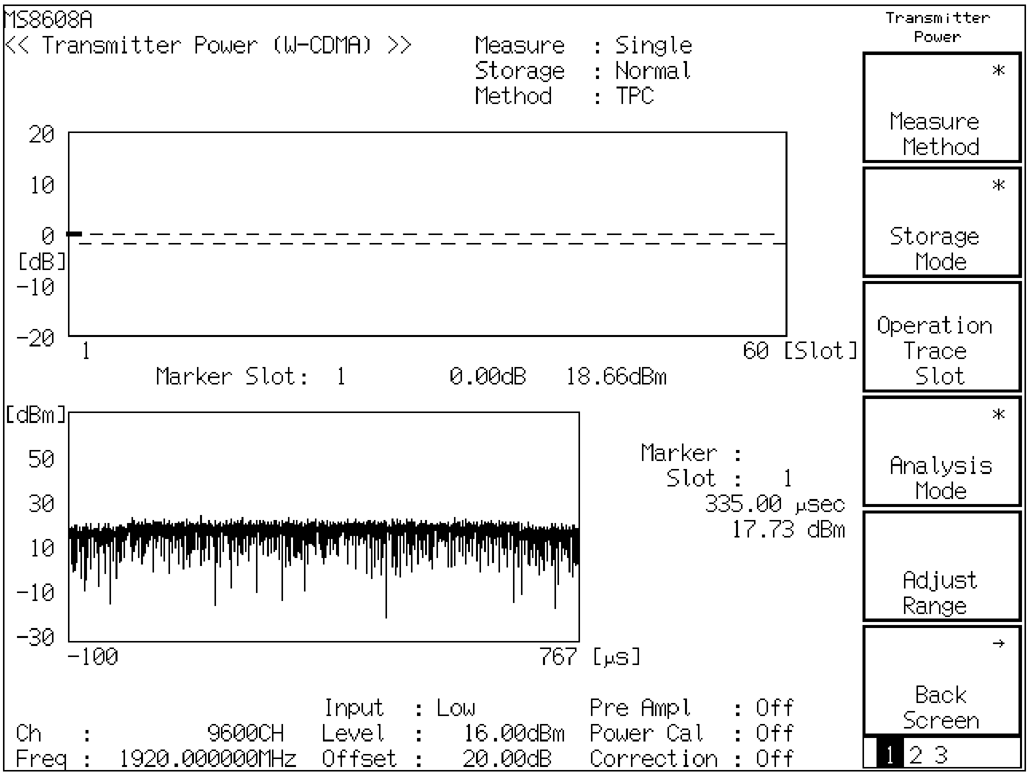
	Relative (dB)				Absolute (dBm)			
	Lower limit	Upper limit	Measured value	Judgment	Lower limit	Upper limit	Measured value	Judgment
Slot 1					–0.8	+0.8	–0.3	Pass
Slot 2	+0.5	+1.5	1.6=1.3 dBm–(–0.3 dBm)	Fail	+0.2	+1.8	+1.3	Pass
Slot 3	–1.5	–0.5	–1.1=0.2 dBm–1.3 dBm	Pass	–0.8	+0.8	+0.2	Pass
Slot 4	–1.5	–0.5	–0.8=–0.6 dBm–0.2 dBm	Pass	–1.8	–0.2	–0.6	Pass
Slot 5	+0.5	+1.5	1.5=0.9 dBm–(–0.6 dBm)	Pass	–0.8	+0.8	+0.9	Fail

Measuring Transmitter Power Control Function <MX860x01B/MX268x01B>

This section describes how to measure the Transmitter Power Control (TPC) function.
Note that this function is available only for MX860x01B/MX268x01B.

Measurement result

Press [F1] (Measure Method) on the Transmitter Power screen to display the function label shown below. Then, press [F2] (TPC) to display the following display.



Waveform display:

Waveform display is divided into two areas at the center of the screen.
The upper area shows the level of each slot. In this area, the horizontal axis stands for slot; and the vertical axis for Level, and the first slot is considered as 0 dB. This waveform is called “Total Waveform” here.
The lower area shows the detailed waveform of which the slot that included the marker of the Total Waveform. In this area, the horizontal axis stands for Time; and the vertical axis for Level. This waveform is called “Expand Waveform” here.

Marker of Total Waveform:

"Slot" indicates the slot number pointed by marker.
"Relative" (unit: dB) shows the alteration to the previous slot.
"Absolute" (unit: dBm) shows the average level of slot.

Marker of Expand Waveform:

"Slot" indicates the slot number pointed by marker in the Total Waveform, and displays the level at the point of marker in the Expand Waveform and Time based on the Slot.

Setting Transmitter Power Control Function

This section describes the setting required for the transmitter power measurement. The description advances assuming that TPC is set for Measure Method on the Transmitter Power screen.
Note that this function is available only for MX860x01B/MX268x01B.

Setting the Analysis Length

1. Press [F4] (Analysis Mode) to display the function label of Analysis Mode.
2. Press [F2] (Analysis Length) to display the setting window.
3. Enter the desired Analysis Length use [∧] [∨] (Entry Keys), the rotary knob, or the numeric keypad.
4. Press [Set] to confirm.

Analysis Length is to be used for setting the target range for calculating the average power of slot of Expand Waveform.

Setting the Analysis Slot

1. Press [F4] (Analysis Mode) to display the function label of Analysis Mode.
2. Press [F3] (Slot Length) to display the setting window.
3. Enter the desired Analysis Slot use [∧] [∨] (Entry Keys), the rotary knob, or the numeric keypad.
4. Press [Set] to confirm.

The entered Analysis Slot is to be used as the slot number of Total Waveform, which is the setting of horizontal axis.

Setting the Scale Mode

1. Press [ ] (More) to display the third page of function-label.
2. Press [F5] (Scale Mode) to display the function level of Scale Mode.
   - Press [F1] (Level) to choose whether the vertical scale is displayed in dB or dBm unit.
   - Press [F2] (Top Level) to set the maximum of the Vertical Scale. It is available only when Level is set to Abs.
   - Press [F3] (Vertical Scale) to set the vertical scale range from 20, 40, 60, 80 and 100.

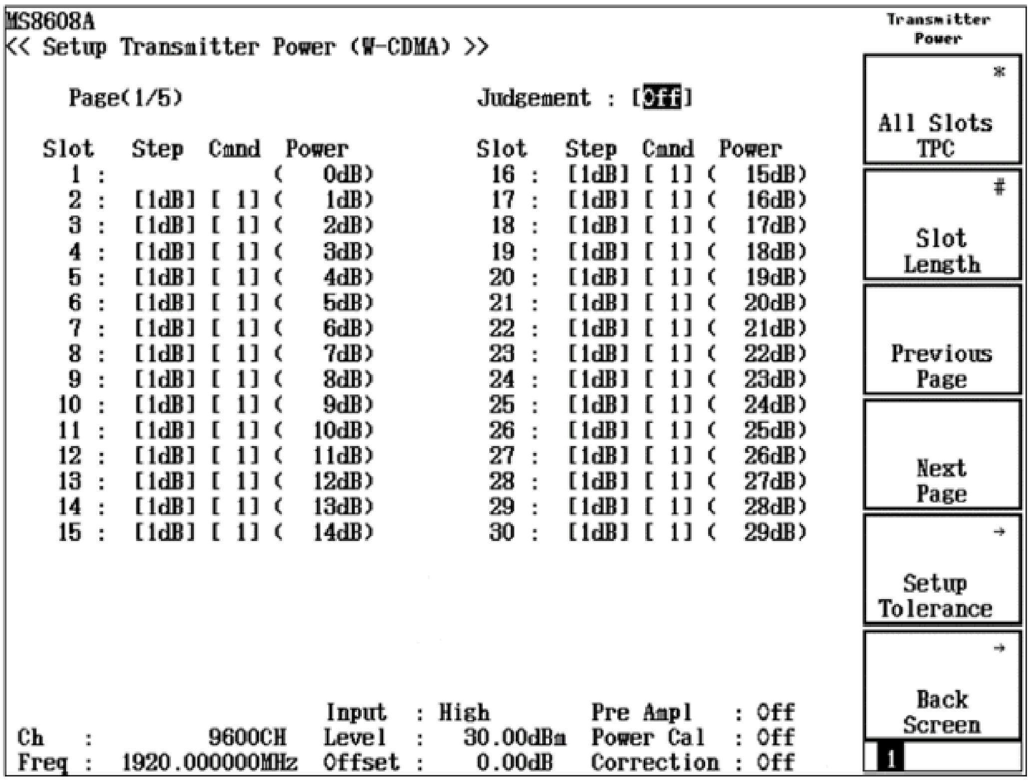
By Operation Trace, Total Waveform or Expand Waveform can be selected.

Making Pass/Fail Judgement (Setup TPC) <MX860x01B/MX268x01B>

This section describes the setting for the Pass/Fail judgement of the transmitter power control measurement.
Note that this function is available only for MX860x01B/MX268x01B.

Screen explanatoin

Press [ ] (More) on the Transmitter Power screen to display the third page of the function label. Selecting [F2] (Setup TPC) displays the Setup Transmitter Power screen.



Judgement

Turning on/off the Pass/Fail judgement.

Setting procedure:

1. Move the cursor to Judgement by using the rotary knob or [∧] [∨] (Entry Keys).
2. Press [Set] to open a setting window.
3. Select the desired mode by using the rotary knob or [∧] [∨] (Entry Keys).
4. Press [Set] to confirm.

Step

Setting the absolute value of threshold for the Pass/Fail judgement of relative level of Slot 1 to 150.

Setting procedure:

1. Same as for Judgement.

Cmnd

Setting the code of threshold for the Pass/Fail judgement of the relative level of Slot 1 to 150.

Setting procedure:

1. Same as for Judgement.

Switching graph pages

1. Press [F3] (Previous page) or [F4] (Next page) to change the graph page to be displayed.

- Previous Page: Returns to the page with the smaller number. When the key is pressed on the first page, the last page is displayed.
- Next Page: Moves to the page with the larger number. When the key is pressed on the last page, the first page is displayed.

Other functions

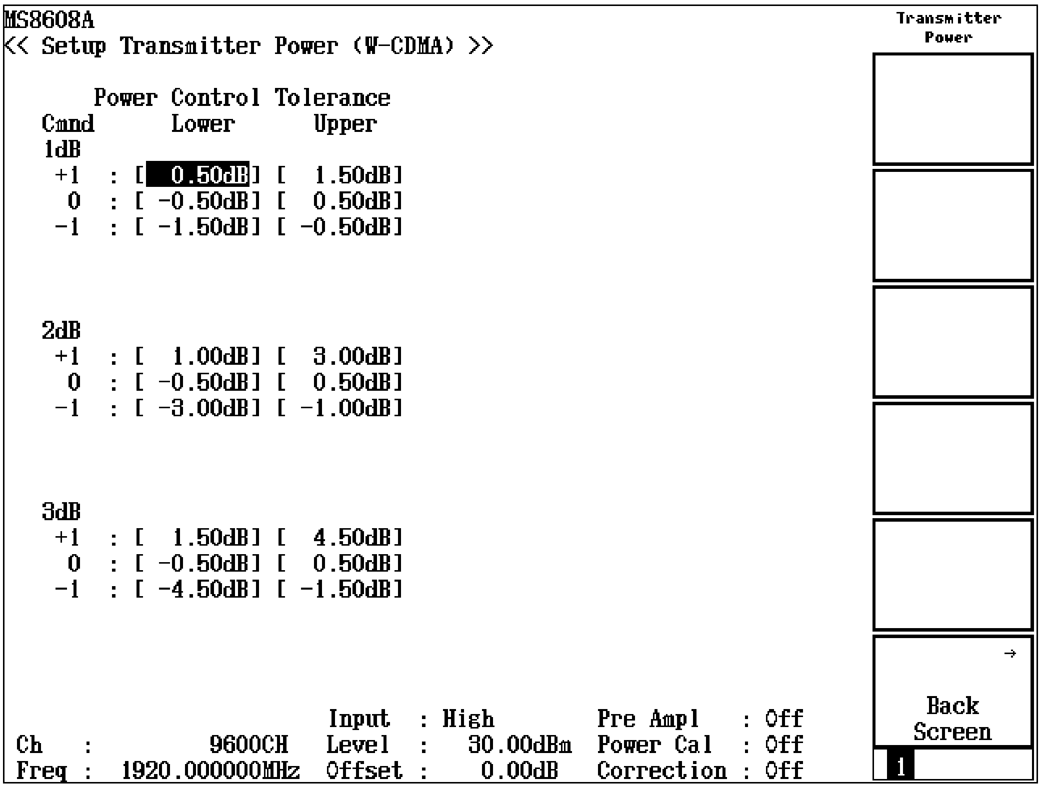
- [F1] (All Slot TPC): Makes all of the TPC Slot setting at once.
- [F2] (Slot Length): Refer to “Setting the Analysis Slot”.

Setting Threshold in Details (Setup Tolerance)

This section describes the detailed setting for Pass/Fail judgement of Transmitter Power Control measurement.
Note that function is available only for MX860x01B/MX268x01B.

Screen explanation

Selecting F5 (Setup Tolerance) on the Setup TPC screen displays the Setup Transmitter Power screen.



Setting the Lower value and Upper value for each Cmnd.
Setting procedure:

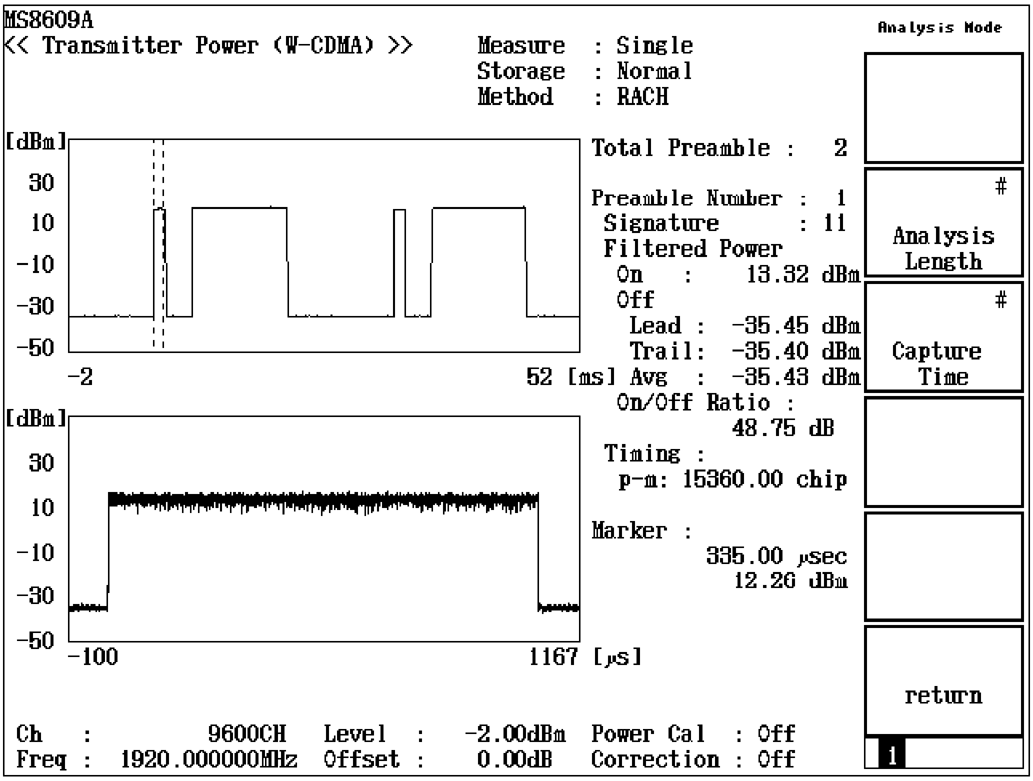
1. Move the cursor to the item you wish to set by using the rotary knob and ∧ ∨ (Entry Keys).
2. Enter the value using the numeric keypad.
3. Press Set to confirm.

Executing RACH Measurement

This section describes how to measure the Random Access Channel (RACH) of Up Link.
Note that this function is available only for MX860x01B/MX268x01B.

Measurement result

Press [F1] (Measure Method) on the Transmitter Power to display the function label shown below. Press [F3] (RACH) to display the following screen.



Waveform display:

Waveform display is divided into two areas at the center of the screen.

The upper area displays waveform for checking preamble and messages. This waveform is called “Total Waveform” here. In this area, the horizontal axis stands for Time (maximum 100 ms); and the vertical axis for Level.

The lower area displays the detailed waveform of Preamble selected in Total Waveform. This waveform is called “Expand Waveform” here. In this area, the horizontal axis stands for Time; and the vertical axis for Level.

Total Preamble:

Displays the total number of Preamble that is displayed in “Total Waveform.”

Preamble Number:

Displays the preamble number pointed by marker, Signature and On Power of the preamble, Off Power of before and preamble and its average value. It also displays the ratio of On Power to Off Power, and the time gap of selected preamble and message.

Setting for RACH Measurement

This section describes the setting required for the RACH measurement. The description advances assuming that “RACH” is set for “Measure Method” on the Transmitter screen.
Note that this function is available only for MX860x01B/MX268x01B.

Setting the Capture Time

1. Press F4 (Analysis Mode) to display the function label of Analysis Mode.
2. Press F3 (Capture Time) to display the setting window.
3. Enter the Capture Time using ∧ ∨ (Entry Keys), the rotary knob or, the numeric keypad.
4. Press Set to confirm.

The entered Capture Time is to be used for the setting of the horizontal axis for Total Waveform.

To detect RACH, change the setting of Capture Time according to the Trigger setting of “Setup Common Parameter.”

- When set to “Freerun”
  Set the value twice the repetitive period of the RACH signal.
- When set to either “External” or “Wide IF”
  Set the value the same or bigger than the repetition term of the RACH signal.

The change method of a graph display is the same as TPC.

Measuring Occupied Bandwidth

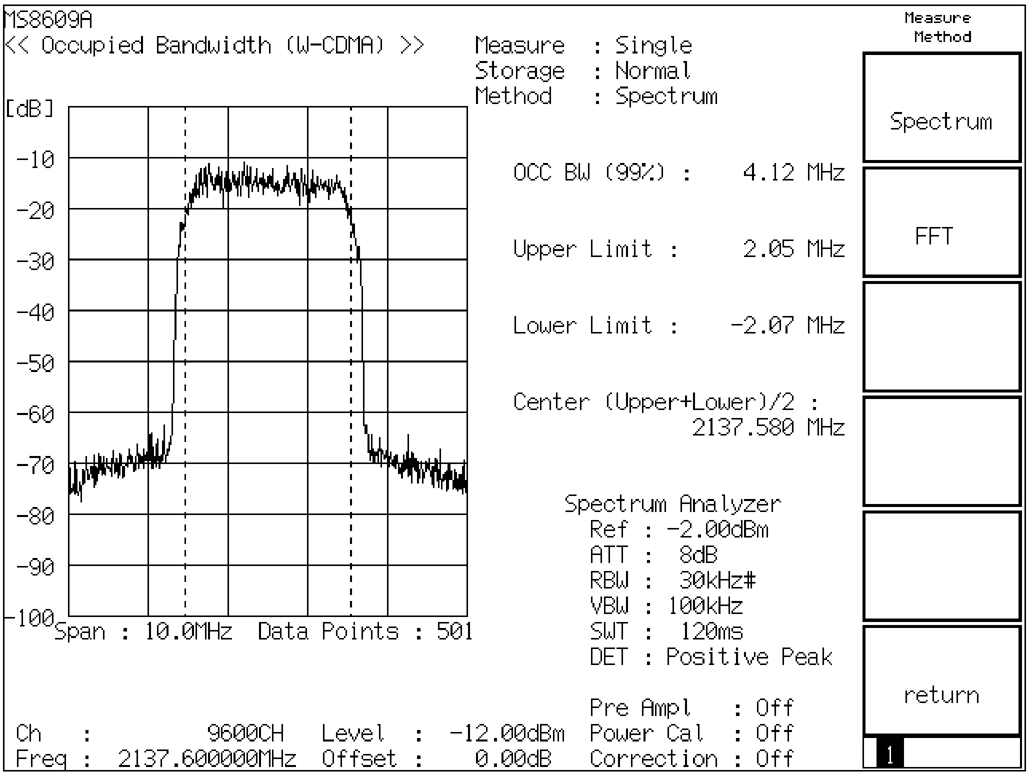
Press [F4] (Occupied Bandwidth) on the Setup Common Parameter screen to move to the Occupied Bandwidth measurement screen.
This screen explains the measured results and the setting parameters shown on the Occupied Bandwidth screen (occupied bandwidth measurement) as well as operation cautions.

Explanation of Measured Results

This section explains the measured results shown on the Occupied Bandwidth screen (occupied bandwidth measurement).
Press [F5] (Adjust Range) to optimize the level settings in the transmitter tester before performing a measurement. See "Optimizing Measurement Range (Adjust Range)" section for more information.

Measurement results

The screen shown below appears when Spectrum is selected for Measure Method.



Waveform display

Displays the spectrum waveform with the horizontal and vertical axes representing the frequency and level, respectively.

When Spectrum is selected for Measure Method, the measurement is performed in Spectrum Analyzer mode and the waveform is displayed. The setting conditions of Spectrum Analyzer mode is displayed at the bottom right of the graph. When FFT is selected for Measure Method, a waveform obtained through an FFT calculation is displayed.

When the I/Q signal is input, selection of Spectrum for Measure Method is disabled and the measurement only in FFT mode is allowed.

OCC BW (99%)

Displays the occupied bandwidth of the signal measured by the 99% method in MHz unit.

The 99% method represents a way to obtain a bandwidth which contains the 99% power of all the (measured) power of the measured signal.

To actually obtain the 99% bandwidth; at first, obtain the upper and lower limits described below, and then use the following formula.

OCC BW = (Upper Limit) − (Lower Limit)

Upper Limit

A difference [between the frequency (containing 0.5% power of the total power, starting from the upper limit of the measured waveform to the lower direction) and the center frequency (set frequency)] expressed in MHz unit.

Lower Limit

A difference [between the frequency (containing 0.5% power of the total power, starting from the lower limit of the measured waveform to the upper direction) and the center frequency (set frequency)] expressed in MHz unit.

Center (Upper + Lower)/2

A center frequency (obtained from the above upper and lower frequency limits) expressed in MHz unit.

Setting result display

Press [F1] (Measure Method) on the Occupied Bandwidth screen to display the following function labels and select a result display.

- [F1] (Spectrum): Performs a measurement in Spectrum Analyzer mode.
- [F2] (FFT): Performs an FFT calculation.
- [F6] (return): Return to the previous function label display.

Measurement time becomes the shorter when using the FFT method than when using the Spectrum method.

Setting SPA Parameters for Spectrum Method

When Spectrum is set for Measure Method, the following SPA sweep parameter can be changed:

- ATT, Ref Level Mode Auto/Manual

  Auto: Sets the attenuator and reference level to their optimum inside the measuring instrument corresponding to the RF input level (Reference Level) set in the Setup Common Parameter screen.

  Manual: Sets the attenuator and reference level manually.

- Ref Level

  Sets the reference level for SPA sweeping.

- Attenuator

  Sets the attenuator for SPA sweeping.

- Attenuator Auto/Manual

  Auto: Automatically sets the attenuator corresponding to the reference level for SPA sweeping.

  Manual: Sets the attenuator for SPA sweeping manually.

- RBW

  Sets the RBW for SPA sweeping.

- VBW

  Sets the VBW for SPA sweeping.

- VBW Auto/Manual

  Sets the VBW corresponding to RBW automatically (Auto) or manually (manual).

- VBW/RBW ratio

  Sets the VBW setting for when VBW Auto is selected using this parameter.

- Sweep Time

  Sets the SPA sweep time.

- Sweep Time Auto/Manual

  Sets the sweep time automatically (Auto) or manually (manual) corresponding set parameters.

- Detection

  Sets the detection mode for SPA sweeping.

- Data Points

  Sets the number of SPA sweep data (501/1001).

- RBW Mode (available only when Opt04 is mounted)

  Sets RBW to digital or analog filter. When digital filter is set RMS detection is added to the detection modes.

Setting ATT, Ref Level mode, Method 1

1. Press [Amplitude] or [Att].
2. Press [ ] (More) to display the third page of the function label.
3. Press [F1] (SPA ATT, Ref Level) to switch between Auto and Manual.

When setting is completed, another measurement is made.

Setting ATT, Ref Level mode, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [F1] (SPA ATT, Ref Level) to switch between Auto and Manual.

When setting is completed, another measurement is made.

Setting Ref Level, Method 1

1. Press [Amplitude] or [Att].
2. Press [ ] (More) to display the third page of the function label.
3. Press [F2] (Ref Level (SPA)).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Ref Level, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [F2] (Ref Level (SPA)).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Attenuator, Method 1

1. Press [Amplitude] or [Att].
2. Press [ ] (More) to display the third page of the function label.
3. Press [F3] (Attenuator (SPA)).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Attenuator, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [F3] (Attenuator (SPA)).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Attenuator mode, Method 1

1. Press [Amplitude] or [Att].
2. Press [ ] (More) to display the third page of the function label.
3. Press [F3] (Attenuator (SPA)).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Attenuator mode, Method 2

1. Press [ ] (More) to display the third page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [F4] (Attenuator) to switch between Auto and Manual.

When setting is completed, another measurement is made.

Setting RBW, Method 1

1. Press [BW].
2. A selection window opens.
3. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
4. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting RBW, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the second page of the function label.
4. Press [F1] (RBW).
5. A selection window opens.
6. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
7. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting VBW, Method 1

1. Press [BW].
2. A selection window opens.
3. Press [F3] (VBW).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting VBW, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the second page of the function label.
4. Press [F3] (VBW).
5. A selection window opens.
6. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
7. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting VBW automatically, Method 1

1. Press [BW].
2. A selection window opens.
3. Press [F4] (VBW) to switch between Auto and Manual.
4. When Manual is selected, # is added to the set VBW value in the result display area.

When setting is completed, another measurement is made.

Setting VBW automatically, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the second page of the function label.
4. Press [F4] (VBW) to switch between Auto and Manual.
5. When Manual is selected, # is added to the set VBW value in the result display area.

Setting VBW/RBW Ratio, Method 1

1. Press [BW].
2. A selection window opens.
3. Press [F5] (VBW/RBW Ratio).
4. A selection window opens.
5. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
6. Press [Set] to confirm.

Setting VBW/RBW Ratio, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the second page of the function label.
4. Press [F5] (VBW/RBW Ratio).
5. A selection window opens.
6. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
7. Press [Set] to confirm.

Setting Sweep Time, Method 1

1. Press [Sweep Time].
2. A selection window opens.
3. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
4. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Sweep Time, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F2] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the third page of the function label.
4. Press [F1] (Sweep Time).
5. A selection window opens.
6. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
7. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Sweep Time automatically, Method 1

1. Press [Sweep Time].

Press [F2] (Sweep Time) to switch between Auto and Manual.

Setting Sweep Time automatically, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the third page of the function label.
4. Press [F2] (Sweep Time) to switch between Auto and Manual.

Setting Detection, Method 1

1. Press [A,B].
2. A selection window opens.
3. Press [F5] (Detection).
4. A selection window opens.
5. Press [∧] [∨] Entry keys or the rotary knob to input the Detection Mode.
6. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Detection, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the third page of the function label.
4. Press [F5] (Detection).
5. A selection window opens.
6. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
7. Press [Set] to confirm.

When setting is completed, another measurement is made.

Setting Data Points, Method 1

1. Press [A,B].
2. A selection window opens.
3. Press [F4] (Data Points) to select the number of sweep points.

When setting is completed, another measurement is made.

Setting Data Points, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the third page of the function label.
4. Press [F4] (Data Points) to select the number of sweep points.

When setting is completed, another measurement is made.

Setting RBW mode, Method 1

1. Press [BW].
2. A selection window opens.
3. Press [F2] (RBW Mode) to switch the RBW mode between Digital and Normal.

When setting is completed, another measurement is made.

Setting RBW mode, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (Setup Spectrum Analyzer) to display the setting key for each parameter. Set each parameter.
3. Press [ ] (More) to display the second page of the function label.
4. Press [F2] (RBW mode) to switch the RBW mode between Digital and Normal.

When setting is completed, another measurement is made.

Averaging Measured Results (Storage Mode)

This section explains the storage mode of the Occupied Bandwidth measurement, through the setting of the averaging process for measured results.
Only the waveforms are averaged during the occupied bandwidth measurement, unlike other measurements performed on other measurement screens.
The measured results are calculated from the averaged waveform.
Note that numeric results are not averaged in this case.

Setting averaging process

1. Press F2 (Storage Mode) on the Occupied Bandwidth screen to display the Storage Mode function labels.
2. Press F2 (Average Count) to open a setting window.
3. Press ∧ ∨ Entry keys or turn the rotary knob, or use numeric keypad to input the number of averaging processes.
4. Press Set to confirm.
5. Press F1 (Storage Mode) in the Storage Mode menu.
6. A selection window opens.
7. Press ∧ ∨ Entry keys or turn the rotary knob to select Average.
8. Press Set to confirm.

When the setting is completed, another measurement is made.
When the number of averaging processes is changed while the storage mode is set at Average, a measurement is also performed after completion the setting.
When no value is changed or when Cancel is selected, no measurements are made again.

Refresh Interval: Sets interval for updating the displayed average value.

- Every: Updates the display after every measurements.
- Once: Updates the display after a measurement is repeated the set number of averaging processes.

The following options are also available for storage mode:

- Normal: Updates and displays the measured results after every measurements.
- Average: Averages and displays the measured results after every measurements.

Measuring Adjacent Channel Leakage Power

Press F5 (Adjacent Channel Power) on the Setup Common Parameter screen to move to the Adjacent Channel Power measurement screen.
This section explains the measured results and setting parameters shown on the Adjacent Channel Power screen (adjacent channel leakage power measurement) as well as operation cautions.
Note that this measurement cannot be performed during IQ input.

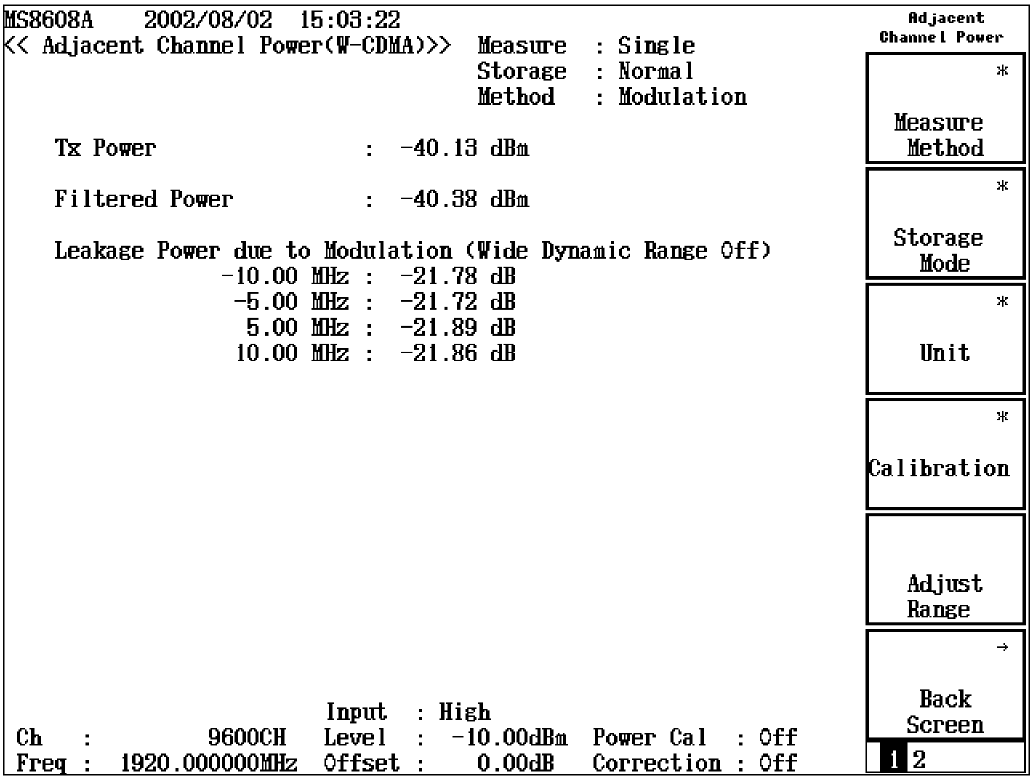
Measuring by Filtering Method

This section explains the measured results shown on the Adjacent Channel Power screen (adjacent channel leakage power).
Press F5 (Adjust Range) to optimize the level setting in the transmitter tester before performing measurement.
For MS860x, to increase the accuracy of level measurement, press F4 (Calibration) and then press F1 (Power Calibration) while inputting the signal, to calibrate the input level using the built-in power meter. For MS268x, to increase the accuracy of level measurement, execute internal calibration in Spectrum Analyzer mode. Refer to the separate "MS268x Spectrum Analyzer operation manual Vol.2, (Detailed Operating Instruction)" for more information.
See "Optimizing Measurement Range (Adjust Range)" and "Power Calibration Function (Power Calibration)" for more information.

- Explanation of measured results

The screen below shows the measured results obtained by the filtering method.

The explanation on the measured result display of filtering method is shown on the following page.



Tx Power

Displays the average power for a single slot of the measured signal in dBm unit. This value is the same as that displayed on the Transmitter power (transmitter power measurement) screen.

Filtered Power

Displays the average power for a single slot of the measured signal passed through the RRC filter in dBm unit. This value is the same as that displayed on the Transmitter power (transmitter power measurement) screen.

Leakage Power due to Modulation

Displays the leakage power at each offset frequency in dBm or W unit, or in the ratio (in dB unit) of the leakage power to the carrier power.
The carrier power and the power at each offset frequency are measured after passing through the built-in RRC filter.

> The 3GPP standard requires that the RRC filter should be used as the reception filter and the power filtered through the RRC filter should be measured. In other words, this measurement conforms to the 3GPP standard. Naturally, the measured result is RMS value.

Displaying filtering method

Display the filtering method in the following procedures.

1. Press [F1] (Measure Method) on the Adjacent Channel Power screen to display Measure Method function labels.
2. Press [F3] (Modulation) to select a filtering method.

Wide dynamic range mode

The filtering method has a mode available that filters (cuts off) the carrier signal to obtain an adequate measurement level margin.
This function, called the wide dynamic range mode, removes out the input attenuation during 10 MHz offset measurement by means of carrier signal filtering.
The wide dynamic range mode can be set in the following procedures.

- Setting wide dynamic range mode

1. Press [F1] (Measure Method) on the Adjacent Channel Power screen to display Measure Method function labels.
2. Press [F5] (Wide Dynamic Range) to switch the wide dynamic range mode between On and Off.

When the setting is completed, another measurement is made. The status (On/Off) of the wide dynamic range setting is displayed in the brackets which comes after “Leakage Power due to Modulation” item.
When the wide dynamic range mode is set to On, no continuous measurement (Continuous) can be performed. However when the storage mode is set at Average, a measurement is repeated by the number of averaging processes specified for averaging.

CAUTION ⚠

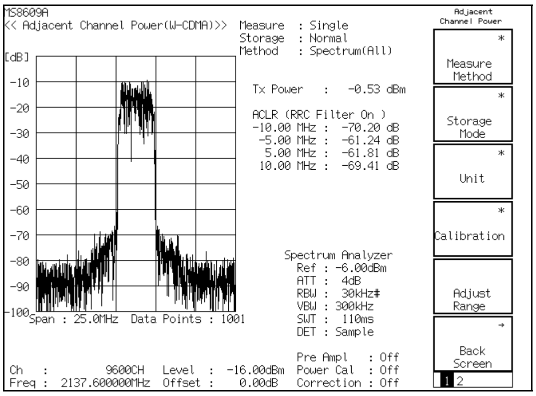
A mechanical relay switch is used in the transmitter tester to switch the signal route, including the input attenuator. Since the mechanical relay switch has a life time of approximately 5-million operations, care should be taken when repeatedly performing a measurement for this measurement item.

Measuring by Sweep Method

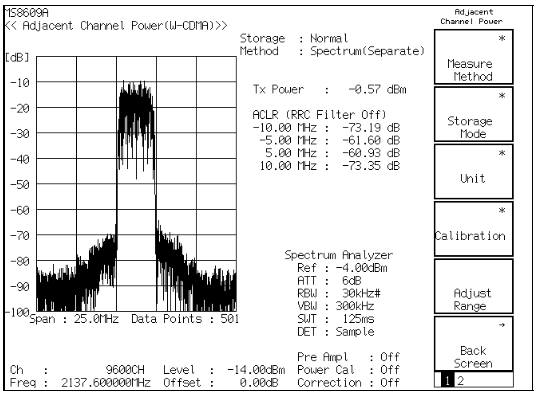
This software supports the sweep method, using Spectrum Analyzer in addition to the filtering method, to measure the adjacent channel leakage power.

Explanation of measured results

The screens below show the measured results obtained by the sweep method.



Sweep method (All)



Sweep method (Separate)

Waveform display

Displays the spectrum waveform with the horizontal and vertical axes representing the frequency and level, respectively.

Two sweep methods are available:

One is "All" method to sweep the all range (25 MHz) at once. Another is "Separate" to sweep the five ranges divided with each 5 MHz. Although the spectrum waveform displayed is same for both method, "All" method provides 501 points of level data and "Separate" method provides 2,501 points of level data.

The settings of Spectrum Analyzer are displayed at the bottom right of the screen.

Tx Power

Displays the average power for a single slot of the measured signal in dBm unit. This value is the same as that displayed on the Transmitter power (transmitter power measurement) screen.

−10.00MHz, −5.00MHz, 5.00MHz, 10.00MHz

Displays the leakage power at each offset frequency in dBm or W unit, or the ratio (in dB) to the carrier power.
The power ratio of the carrier power to the power at each the offset frequency, as well as the power at each offset frequency, is calculated as follows.
At first, the waveform data in the carrier frequency band of 3.84 MHz is converted into power values and integrated. Similarly, the integrated power value in the range (3.84 MHz) of each the offset frequency is obtained. The ratio of these powers is the result of power ratio at each offset frequency. And the leakage power at each offset frequency is derived from multiplying Tx Power by the ratio of power at each offset frequency.

Displaying sweep method

Display the sweep method (All) by the following procedures.

1. Press F1 (Measure Method) on the Adjacent Channel Power screen to display the Measure Method function label.
2. Press F1 (Spectrum (All)) to select the sweep method (All).

Display the sweep method (Separate) by the following procedures.

1. Press F1 (Measure Method) on the Adjacent Channel Power screen to display the Measure Method function label.
2. Press F2 (Spectrum (Separate)) to select the sweep method (Separate).

In the Separate mode, the input attenuator is removed out during 10 MHz offset measurement by taking advantage of the fact that the carrier signal is filtered (removed). For this reason, no continuous measurement (Continuous) can be performed in the Separate mode. However, when the storage mode is set at Average, a measurement is repeated by the number of averaging processes specified for averaging.

RRC Filter

1. Press F1 (Measure Method) on the Adjacent Channel Power screen to display the Measure Method function label.
2. Press F4 (RRC Filter) to change On/Off.

This function is available only when Measure Method is set to Spectrum (ALL) or Spectrum (Separate).

CAUTION ⚠

A mechanical relay switch is used in the transmitter tester to switch the signal route, including the input attenuator. Since the mechanical relay switch has a life time of approximately 5-million operations, care should be taken when repeatedly performing a measurement for this measurement item.

Setting SPA Parameters for Spectrum Method

When Spectrum (All) or Spectrum (Separate) is set for Measure Method, the following SPA sweep parameter can be changed:

- ATT, Ref Level Mode Auto/Manual

  Auto: Sets the attenuator and reference level to their optimum inside the measuring instrument corresponding to the RF input level (Reference Level) set in the Setup Common Parameter screen.

  Manual: Sets the attenuator and reference level manually.

- Ref Level

  Sets the reference level for SPA sweeping.

- Attenuator

  Sets the attenuator for SPA sweeping.

- Attenuator Auto/Manual

  Auto: Automatically sets the attenuator corresponding to the reference level for SPA sweeping.

  Manual: Sets the attenuator for SPA sweeping manually.

- RBW

  Sets the RBW for SPA sweeping.

- VBW

  Sets the VBW for SPA sweeping.

- VBW Auto/Manual

  Sets the VBW corresponding to RBW automatically (Auto) or manually (Manual).

- VBW/RBW ratio

  Sets the VBW setting for when VBW Auto is selected using this parameter.

- Sweep Time

  Sets the SPA sweep time.

- Sweep Time Auto/Manual

  Sets the sweep time automatically (Auto) or manually (Manual) corresponding to set parameters.

- Detection

  Sets the detection mode for SPA sweeping.

- Data Points

  Sets the number of SPA sweep data (501/1001).

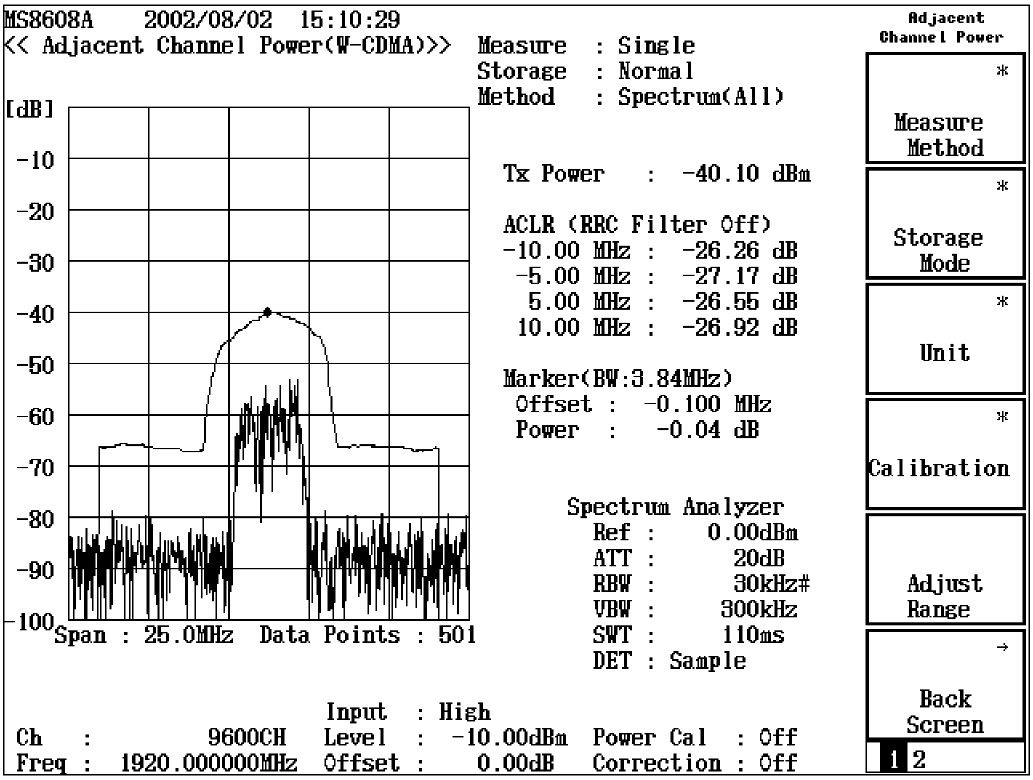
- RBW Mode (available only when Opt04 is mounted)

  Sets RBW to digital or analog filter. When digital filter is set, RMS detection is added to the detection modes.

Displaying Graph

When the sweep method (All) is selected as the measurement method, the adjacent channel leakage power graph can be displayed together with the waveform.

An example of displaying adjacent channel leakage power graph is shown below.



Graph display

Assuming that each data point is display at an offset frequency; the graph displays the leakage power at each offset frequency in dBm or W unit, or the ratio (in dB unit) of the leakage power to the carrier power in a waveform format.

The graph display is set to On or Off in synchronization with the On or Off setting of the marker, and the measured value is read by the marker.

There are two ways to display the graph and marker, as below.

Displaying graph and marker, Method 1

1. Press [Marker] to display the marker function label.
2. Press [F1] (Marker) to change the setting of Normal and Off alternatively.

Displaying graph and marker, Method 2

1. Press [ ] (More) to display the second page of the function label.
2. Press [F3] (Marker) to change the setting of Normal and Off alternatively.

Setting the marker to Normal cause a diamond (◆) marker to appear on the waveform.

Changing Unit of Measured Value (Unit)

This section explains how to change the unit of the adjacent channel leakage power value to be measured

Setting unit display.

Press [F3] (Unit) on the Adjacent Channel Power screen to display the following function labels, and select a unit.

- [F1] (dBm): Displays the power value in dBm.
- [F2] (mW): Displays the power value in mW.
- [F3] (μW): Displays the power value in μW.
- [F4] (nW): Displays the power value in nW.
- [F5] (dB): Displays the power value in dB.
- [F6] (return): Return to the previous function label display.

To enable a comparison in the same time unit; mW, μW, and nW settings are available. When a measured value has exceeded the highest digit which can be displayed, 999.999 (999 in the case of nW) is displayed. When a measured value has fallen less than the lowest digit which can be displayed, 0.000 is displayed.

Averaging Measure Result (Storage Mode)

This section explains the storage mode of Adjacent Channel Leakage Power measurement through the setting of the measured result averaging process.

Setting averaging process

1. Press [F2] (Storage Mode) on the Adjacent Channel Power screen to display the Storage Mode function label.
2. Press [F2] (Average Count) to open the setting window.
3. Press [∧] [∨] Entry keys or turn the rotary knob, or use numeric keypad to input the number of averaging processes.
4. Press [Set] to confirm.
5. Then, press [F1] (Storage Mode) in the Storage Mode menu.
6. A selection window opens.
7. Press [∧] [∨] Entry keys or turn the rotary knob to select Average.
8. Press [Set] to confirm.

When the setting is completed, another measurement is made.
When the number of averaging processes is changed while the storage mode is set at Average, a measurement is also performed again after completion of the setting.
When no values are changed or when Cancel is selected, no measurements are mode again.

Refresh Interval: Sets interval for updating the average value displayed.

- Every: Updates the display after every measurements.
- Once: Updates the display after a measurement is repeated the set number averaging processes.

The following options are also available for storage mode.

- Normal: Updates and displays the measured results after every measurements.
- Average: Averages and displays the measured results after every measurements.

When the filtering method is used, the (W) value for carrier power (Tx Power) and the value for leakage power at each offset frequency power at each offset frequency are averaged.

When the sweep method is used, the waveforms are averaged. In this case, averaging actually is performed by using the power value. That is, a waveform measured is first converted into the power value, which is then averaged together with the power values of previously measured waveforms. Then, the result is turned into the form of the dBm value, and a waveform is drawn.

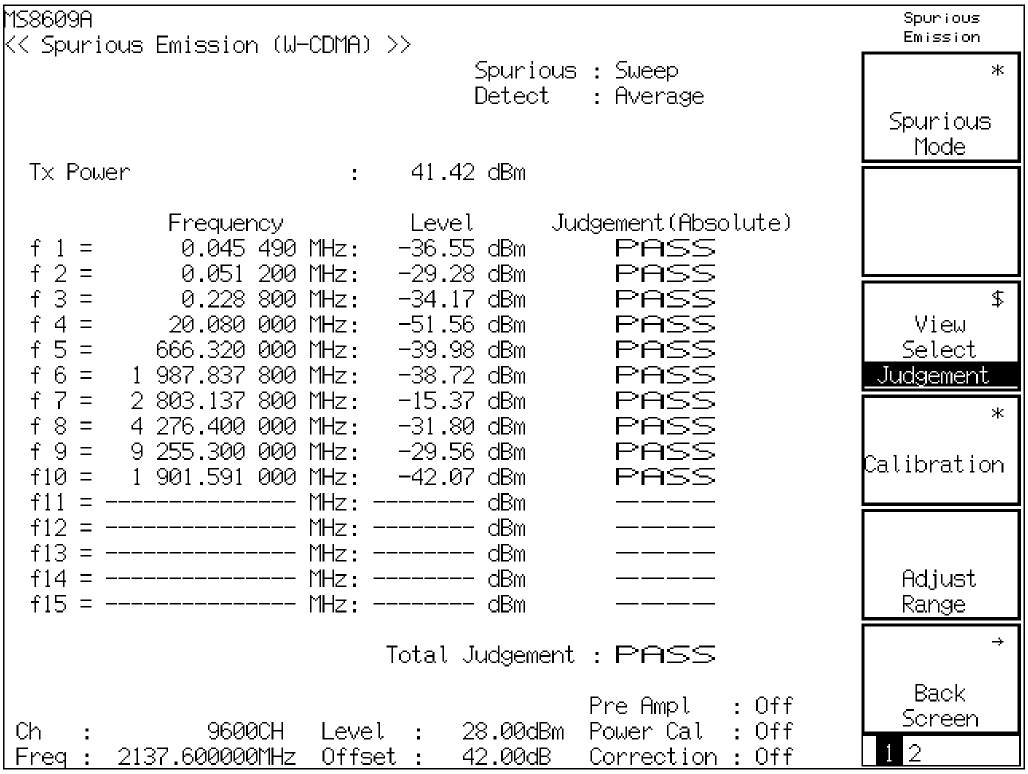
The power ratio is obtained from this averaged waveform as the reference.

The carrier power (Tx Power) is separately averaged, and the value of the leakage power at each offset frequency is obtained from the power ratio and the carrier power value.

Measuring Spurious

This section explains the measured results and setting parameters shown on the Spurious Emission screen.
Spurious measurement cannot be performed during IQ input.

Explanation of Measured Results <MX860x01A/MX268x01A>



Note that this function is available only for MX860x01A/MX268x01A.

Tx Power

Displays the average power for a single slot of the measured signal in dBm units. This value is the same as that displayed in the Transmitter Power screen.

Frequency

Displays the spurious frequency.

Level

Displays the spurious level.

Judgement

Judges the measured results against the upper level limit set in the Setup Spot Table or Setup Sweep/Search Table screen, and displays results.

This item appears only when Judgement is selected in the window for [F3] (View Select).

RBW, VBW, SWT

Displays RBW, VBW and Sweep Time measurement conditions for Spectrum Analyzer.

This item appears only when BW, SWT is selected in the window for [F3] (View Select).

RefLvl, ATT

Displays Reference Level and ATT measurement conditions for Spectrum Analyzer.

This item appears only when RefLvl, ATT is selected in the window for [F3] (View Select).

Spurious, Detect Preselector

Displayed in the upper right part of the screen.

(1) Spurious
Displays the measurement method selected for Spurious Mode.

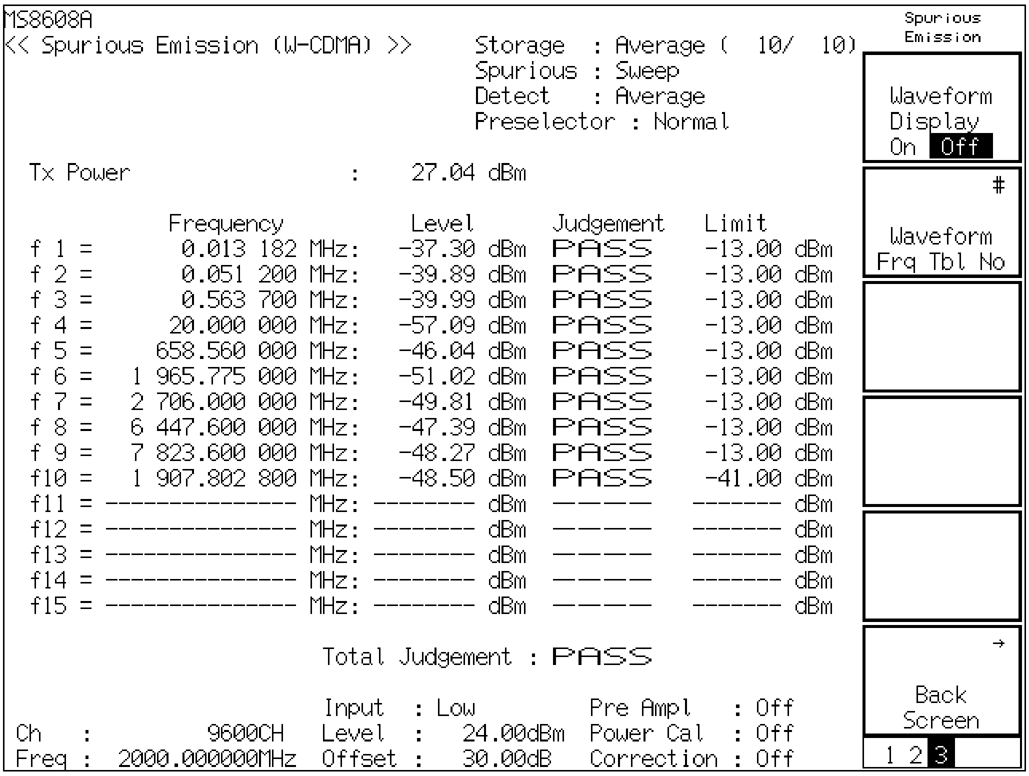
(2) Detect
Displays the detection mode for Spectrum Analyzer.

(3) Preselector
Displays the operation mode for the preselector. This item appears only when MS8608A-03/MS2683A-03 option is mounted. For details, refer to “Setting preselector mode”.

Explanation of Measured results <MX860x01B/MX268x01B>

The display shown below appears when “Off” is set for Waveform Display. For the setting procedure of Waveform Display, refer to the section “Displaying Waveform”.

Note that this function is available only for MX860x01B/MX268x01B.



Tx Power:

Displays the average power of one slot of the signal under measurement in dBm unit. This value is the same as the one in the Transmitter Power measurement screen.

Frequency:

Displays the Spurious Frequency.

Level:

Displays the Spurious Level.

Judgement:

Display the result with the limit level used for judgement after performing judgement according to the limit level set at Setup Spot Table or Setup Sweep/Search Table.

Note that the display appears only when “Judgement” is selected by pressing [F3] (View Select).

RBW, VBW, SWT

Displays the measurement conditions of RBW, VBW and Sweep Time of Spectrum Analyzer. Note that the display appears only when “BW” or “SWT” is set by pressing [F3] (View Select).

RefLvl, ATT

Displays the measurement condition of “Reference Level” and “ATT”. Note that the display appears only when “RefLvl” or “ATT” is set by pressing [F3] (View Select).

Spurious, Detect, Preselector

Items displayed at the right-hand corner of the screen.

(1) Spurious

Displays the set Measurement Method at Spurious Mode.

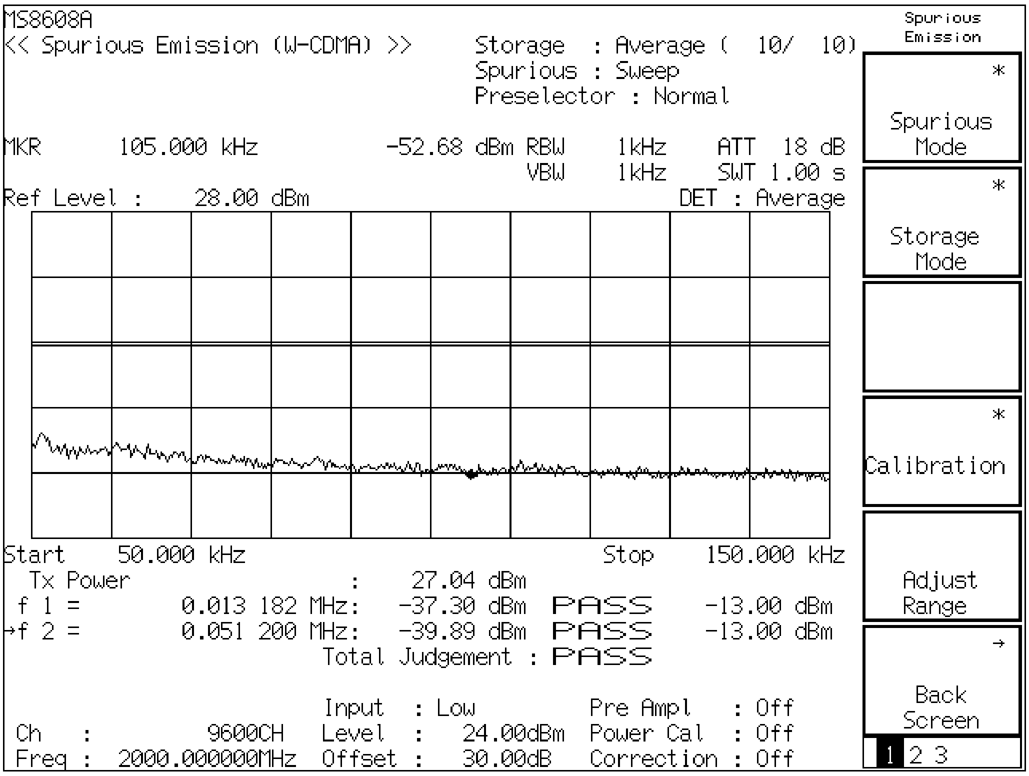
(2) Detect

Displays the Detection Mode of Spectrum Analyzer.

(3) Preselector

Displays the Operation Mode of the preselector. This function is available only when the options, MS8608A-03/MS2683A-03, is installed. For more information, refer to the section “Selecting Preselector Mode (Preselector)”.

The display shown below appears when “On” is set for Waveform Display. For the setting procedure of Waveform Display, refer to the section “Displaying Waveform”



Spurious Waveform display:

Displays the waveform that is gained by executing Sweep by Spectrum Analyzer, and the specified value that is used for the Pass/Fail judgement; over the frequency table indicated with the arrow (->) at the bottom of the screen. Also displays the average power of time-axis sweep waveform that is gained while Spurious Mode is set to Spot or Search is line.

Measurement result of Spurious:

Displays the measurement result of Spurious over the frequency table indicated with the arrow (->) at the bottom of the screen. This is the same display as the one when “Waveform Display” is set to “Off”.

Marker:

Displays the lozenge-shaped marker in the waveform. “MKR,” shown at the top of the screen, displays the result.

Averaging Measured Results (Storage Mode)

This section describes the Storage Mode by showing how to set the averaging procedure of measurement result.
Note that this function is available only for MX860x01B/MX268x01B.

Setting averaging process

1. Press F2 (Storage Mode) to display the function label of Storage Mode.
2. Press F2 (Average Count) to display the setting window.
3. Enter the number of averaging using ∧ ∨ (Entry Keys) the rotary knob, or the numeric keypad.
4. Press Set to confirm.
5. Then, press F1 (Storage Mode) in the menu of “Storage Mode”.
6. The setting window opens.
7. Select “Average” using ∧ ∨ (Entry keys) or the rotary knob.
8. Press Set to confirm.

Completing the setting cause re-measuring to start.

The re-measurement occurs as previously described even the setting is proceeded while Storage Mode is set to “Average,” but not when you did not change the value, or canceled.

Refresh Interval: Sets the timing to renew the averaging value display.
- Every: Renews the display at every measurement.
- Once: Renews the display after reaching the set number of average.

For Storage Mode, the following items are user-definable besides Average:

- Normal: Displays the renewed measured result at every measurement.
- Average: Displays the averaged measured result at every measurement.

Displaying Waveform (Waveform Display)

This section describes the waveform display that is executed Sweep by Spectrum Analyzer, and the selection of the frequency table to be displayed.
Note that these functions are available only for MX860x01B/MX268x01B.

Setting the Waveform Display

1. Press [ ] (More) to display the third page of function label of Spurious.
2. Press [F1] (Waveform Display) and select "On".

Selecting the frequency table to be displayed

1. Press [ ] (More) to display the third page of function label of Spurious.
2. Press [F2] (Waveform Frq Tbl No) and select the frequency table to be displayed. Press [F3] (Previous Page) and [F4] (Next Page) to display the frequency tables in order.

Setting Spurious Measurement Method (Spurious Mode)

Press [F1] (Spurious Mode) to display the following function labels, and select the measurement method.

- [F1] (Spot): Performs time domain measurement for the frequency set in Setup Spot Table on obtain the average value.
- [F2] (Search): Sweeps the frequency range set in the Search/Sweep Table screen to perform Spot measurement on the peak of the searched result.
- [F3] (Sweep): Sweeps the frequency range set in the Setup Search/Sweep Table screen to obtain the peak point frequency and level.

Setting Unit of Spurious Level (Unit)

Sets the display unit for measured value and performs judgement against the standard value in the unit.

1. Press [ ] (More) to display the second page of the Spurious function label.
2. Select the unit by pressing [F4] (Unit) to switch between dBm and dB. The reference level for dB display is a value obtained by the measurement method set for Ref Power.

Selecting Preselector Mode (Preselector)

This function is available only when MS8608A-03/MS2683A-03 option is mounted to the main body. (this option can only be mounted on MS8608A/MS2683A)

Sets whether to use Band 0 (Normal) or Band 1 (Spurious) for measurement from 1.6 to 3 GHz.

The Spurious mode sweeps the 1.6 to 3 GHz range in Band 1, so the measurement is not affected by the harmonics from Spectrum Analyzer itself.

Setting preselector mode

1. Press [ ] (More) to display the second page of the Spurious function label.
2. Press [F5] (Setup Spectrum Analyzer).
3. To enable the preselector, select Spurious by pressing [F4] (Preselector) to switch between Normal and Spurious.

This setting is common to all Spurious Modes.

Setting Detection Mode (Detection)

Setting the detection mode

1. Press [ ] (Mote) to display the second page of the Spurious function label.
2. Press [F5] (Setup Spectrum Analyzer).
3. Press [F5] (Detection).
4. A selection window opens.
5. Press [∧] [∨] Entry keys or the rotary knob to input the Detection Mode.
6. Press [Set] to confirm.

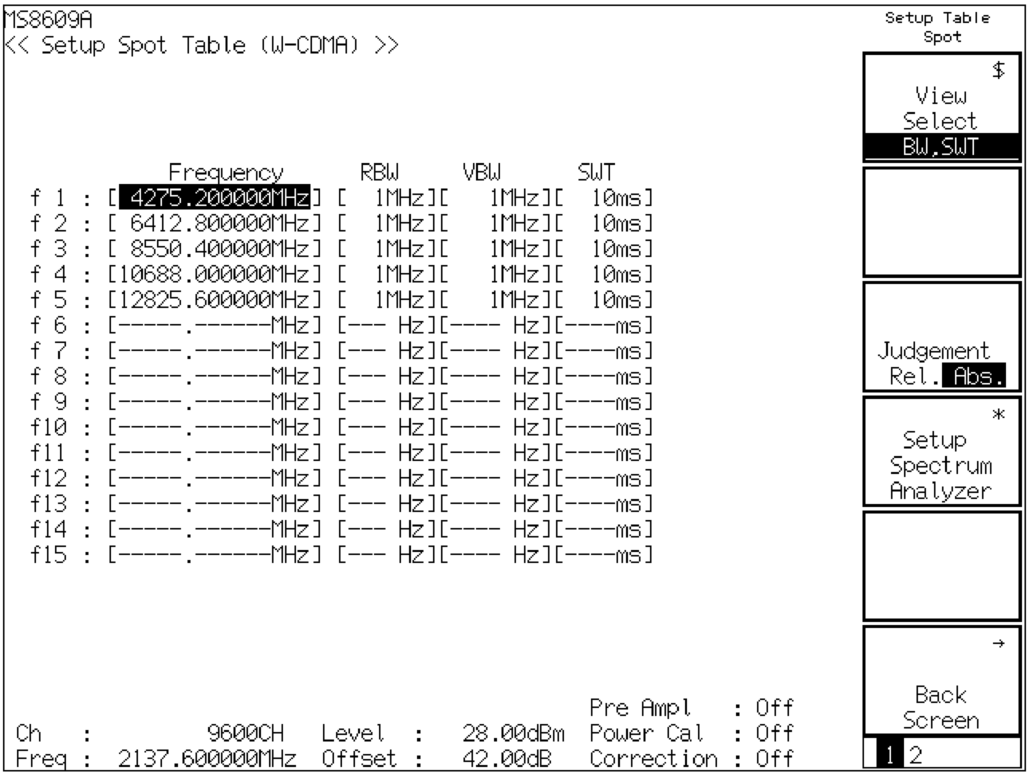
This setting common to the Spurious Mode currently set.

Setting Measurement Frequency for Spot Method (Setup Spot Table)

This section explains how to set the measurement frequency and others for spot measurement in the Setup Spot Table screen.

Displaying the Setup Spot Table screen

1. While the Spurious Emission screen is displayed, press [F1] (Setup Spot Table) on the second page of the Spurious function label.
2. The Setup Spot Table screen (shown below) appears.



Setting the measurement frequency, RBW, VBW, Sweep Time and Limit Level

1. Press [∧] [∨] Entry Keys or turn the rotary knob to move the cursor to the item to be set.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press [∧] [∨] to move the cursor to the item to be set.
5. Press [Set] to confirm.

When setting is completed, the set value appears in square brackets [] for the specified item.

Setting harmonics

1. Press [ ] (More) to display the second page of the Setup Table Spot function label.
2. Press [F5] (Harmonics) to open a confirmation window. Select Yes to automatically set the harmonics for the frequency set in the Setup Common Parameter screen. This clears the current frequency and RBW setting.

Clearing all setting

1. Press [F2] (Clear) to open the confirmation window to set the value deletion.
2. Move the cursor to Yes by using the rotary knob.
3. Press [Set] Entry key to clear all the setting values.

Deleting the cursor line

1. Press [F3] (Delete) to delete the cursor line and thereby shift up the succeeding line.

Inserting a blank line before line cursor line.

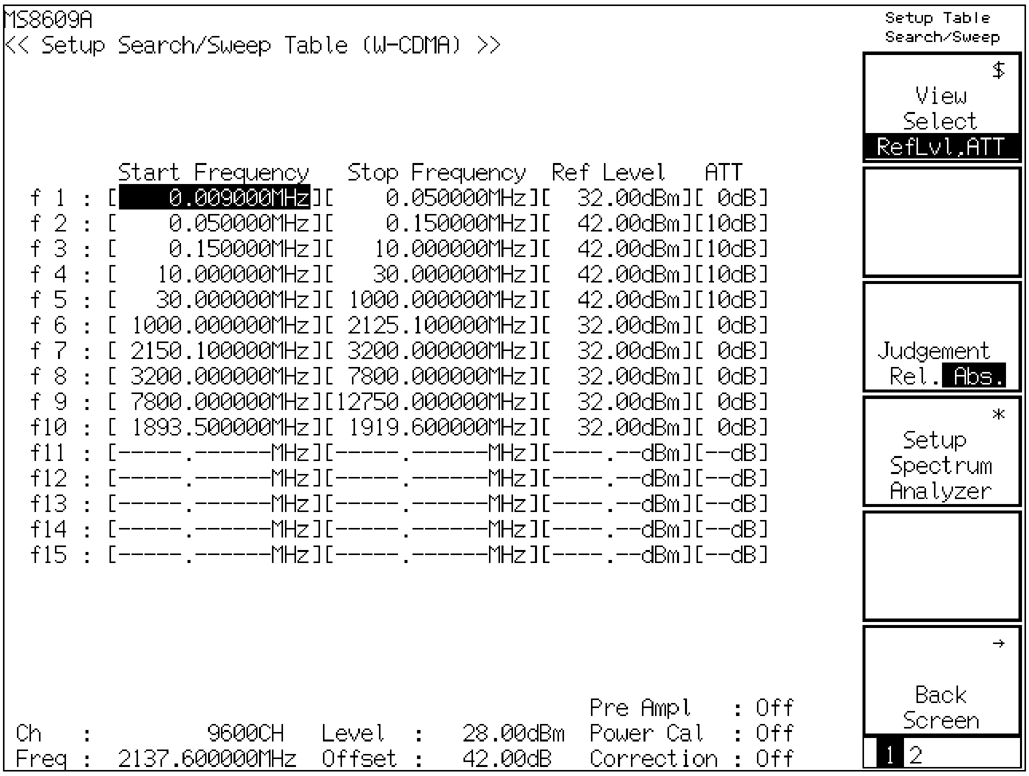
1. Press [F4] (Insert) to shift down the cursor line and succeeding lines and insert a blank line (---) on the cursor position. A blank line cannot be inserted when [f15] is set.

Setting Sweep Range for Search/Sweep Methods (Setup Search/Sweep Table)

This section explains how to set the sweep range and others for search/sweep measurements in the Setup Search/Sweep Table screen.

Displaying the Setup Search/Sweep Table screen

1. While the Spurious Emission screen is displayed, press F2 (Setup Search/Sweep Table) on the second page of the Spurious function label.
2. The Setup Search/Sweep Table screen (shown below) appears.



Setting the start/stop frequency

1. Press ∧ ∨ Entry keys or turn rotary knob to move the cursor to the Start Frequency or Stop Frequency item to be set.
2. Set the frequency by using the numeric keypad.

When setting is completed, the set frequency appears in square brackets [ ] for the specified item. The start and stop frequencies are automatically set to be 1 kHz or more apart. For example, setting the stop frequency to 100 kHz while the start frequency is set to 100 kHz changes the start frequency to 99 kHz automatically.

Setting RBW, VBW, Sweep Time and Limit Level

1. Press [∧] [∨] Entry keys or turn rotary knob to move the cursor to the item to be set.
2. Press [Set] Entry key.
3. A selection window opens.
4. Press [∧] [∨] to move the cursor to the item to be set.
5. Press [Set] to confirm.

When setting is completed, the set value appears in square brackets [ ] for the specified item.

Clearing all setting

1. Press [ ] (More) to display the second page of the Setup Table Search/Sweep function label.
2. Press [F2] (Clear) to open the confirmation window to set value deletion.
3. Move the cursor to Yes by using the rotary knob.
4. Press [Set] Entry key to clear all the setting values.

Deleting the cursor line

1. Press [ ] (More) to display the second page of the Setup Table Search/Sweep function label.
2. Press [F3] (Delete) to delete the cursor line and thereby shift up the succeeding line.

Inserting a blank line before line cursor line

1. Press [ ] (More) to display the second page of the Setup Table Search/Sweep function label.
2. Press [F4] (Insert) to shift down the cursor line and succeeding lines and insert a blank line (---) on the cursor position. A blank line cannot be inserted when [f15] is set.

Setting the standard value

1. Press [ ] (More) to display the second page of the Spurious function label.
2. Press [F5] (Standard) to select the standard.

Setting Frequency/Sweep Table Details

This section explains how to set details for the frequency and sweep tables.

While the Setup Spot Table or Setup Search/Sweep Table screen is displayed, press [F4] (Setup Spectrum Analyzer) on the first page of the function label to switch among parameter setting screens.

Setting RBW automatically

1. Press [F2] (RBW Auto Manual) to switch between Auto and Manual.

When Auto is selected, RBW is set as shown below according to the set start frequency:

- When the frequency is from 1 kHz to 150 kHz (not including 150 kHz): 1 kHz
- When the frequency is from 150 kHz to 30 MHz (not including 30 MHz): 10 kHz
- When the frequency is from 30 MHz to 1000 MHz (not including 1000 MHz): 100 kHz
- When the frequency is 1000 MHz or higher: 1 MHz

Setting VBW automatically

1. Press [F3] (VBW) to switch between Auto and Manual. Select Auto.

When Auto is selected, VBW is set according to the VBW/RBW Ratio and RBW settings.

Setting VBW/RBW Ratio

1. Press [F4] (VBW/RBW Ratio) to open the selected window.
2. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input a value.
3. Press [Set] to confirm.

Setting Sweep Time automatically

1. Press [F5] (Sweep Time) to switch between Auto and Manual. Select Auto.
2. When Auto is selected, Sweep Time in all set frequency tables is automatically set.

Setting RBW mode

This function is available only when MS860xA-04 or MS268xA/B-04 option is mounted.

1. Select Digital or Normal by pressing [F1] (RBW) to switch between them. When Digital is selected, RMS replaces Average in the Detection screen.

RBW mode menu setting is disabled when MS860xA-04 or MS268xA/B-04 option is not mounted.

Setting ATT, Ref Level mode

1. Press [ ] (More) to display the second page of the function label.
2. Press [F1] (SPA ATT, Ref Level) to switch between Auto and Manual.

Setting Attenuator mode

1. Press [ ] (More) to display the second page of the function label.
2. Press [F4] (Attenuator) to switch between Auto and Manual.

Displaying Demodulation Data <MX860x01A/MX268x01A>

Pressing F1 (Demodulation Data) on the second page of the function label for the Setup Common Parameter screen moves to the Demodulation Data screen.

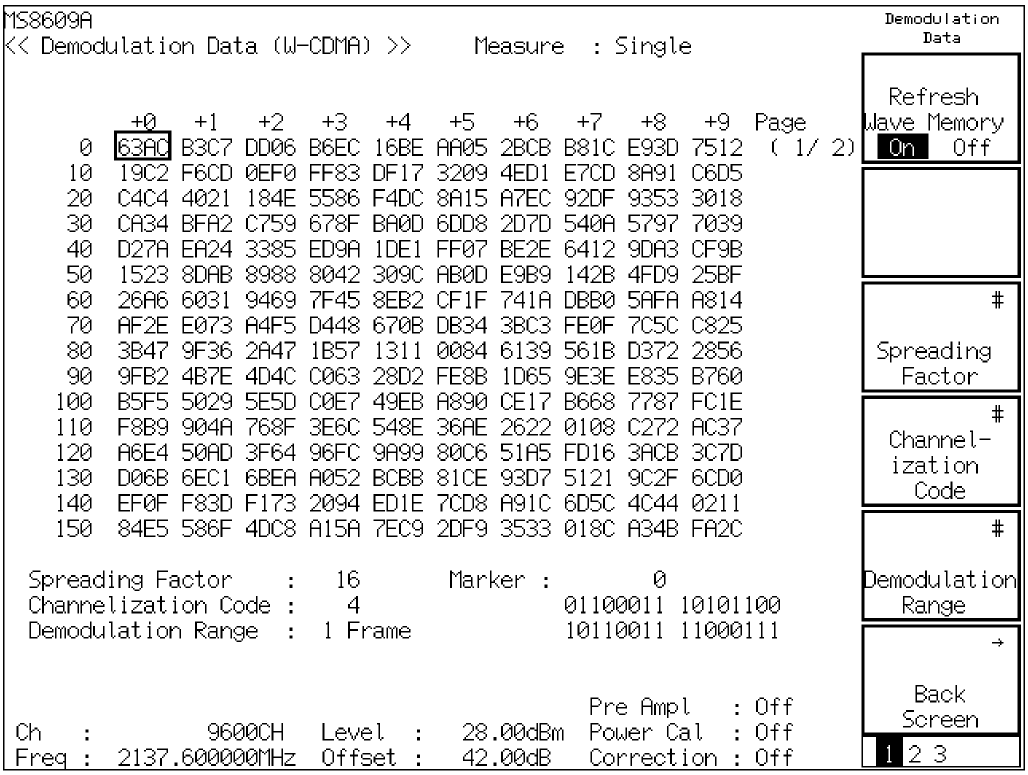
The section explains the measured results, setting parameters and precautions on using the Demodulation Data screen.

Note that this function is available only for MX860x01A/MX268x01A.

Explanation of Measured Results

This section explains the measured results displayed in the Demodulation Data screen. Optimize the level setting inside the measurement instrument by pressing F5 (Adjust Range) before measurement. Refer to “Optimizing Measurement Range (Adjust Range)” for more details.

Measured results



Demodulation Data

The demodulation data displayed here is the Symbol Data obtained by reverse-spreading the spread signals. The data is displayed in hexadecimal, delimited in 2-byte step. The labels on the upper and left portions of the data have no meaning for the demodulated data; they are just to aid in viewing.

If the demodulation data cannot be displayed on a single screen, it is displayed on multiple pages.

Spreading Factor

Displays the Spreading Factor to be demodulated.

Channelization Code

Displays the Channelization Code to be demodulated.

Demodulation Range

Displays the number of frames to be demodulated.

Marker

Displays the demodulation data indicated by the rectangle marker in binary number. Binary display includes demodulation data indicated by the rectangle marker and that for the next. This marks it easier to see a data cutting across markers.

Setting Demodulation Channel

To demodulate another channel, set the target Spreading Factor and Channelization Code. Also make the IQ selection for Up Link.

Setting Spreading Factor

1. Press F3 (Spreading Factor) in the Demodulation Data screen to open the setting window.
2. Press ∧ ∨ Entry keys or turn the rotary knob to move the cursor to the item to be set.
3. Press Set to confirm.

Setting Channelization Code

1. Press F4 (Channelization Code) in the Demodulation Data screen to open the setting window.
2. Press ∧ ∨ Entry keys or turn the rotary knob to move the cursor to the item to be set.
3. Press Set to confirm.

Setting I/Q

1. Press F2 (Demodulation Phase) in the Demodulation Data screen to switch between I and Q.

When Refresh Wave Memory is set to Off, the same signal data is demodulated. When it is set to On, a new signal data is loaded into the measurement instrument to be demodulated.

Setting Demodulation Data Range

A maximum of 10 frames of data can be demodulated.

Setting the number of data to be demodulated

1. Press F5 (Demodulation Range) in the Demodulation Data screen to open the setting window.
2. Press ∧ ∨ Entry keys, turn the rotary knob or use the numeric keypad to input the range of data to be demodulated.
3. Press Set to confirm.

Demodulation Data and Phase

The demodulation performed here can be select for pilot symbol synchronization.

When pilot symbol synchronization is set to Off, the initial phase cannot be determined when performing demodulation so the data rotates on the IQ plane.

This function is meaningless for a signal without a pilot symbol.

Setting pilot symbol synchronization

1. Press [ ] (More) to display the second page of the function label.
2. Press [F4] (Pilot Symbol Sync) to set pilot symbol synchronization On/Off (set to On to perform pilot symbol synchronization).

When pilot symbol synchronization is set to Off, data rotates on the IQ plane. A function data by 90° on the IQ plane is available.

Perform the following to rotate the data:

1. Press [ ] (More) to display the second page of the function label.
2. Press [F5] (Rotation) to rotate the data on the IQ plane by 90° . Pressing [F5] four times returns the data to its original position.

Displaying Demodulation Data <MX860x01B/MX268x01B>

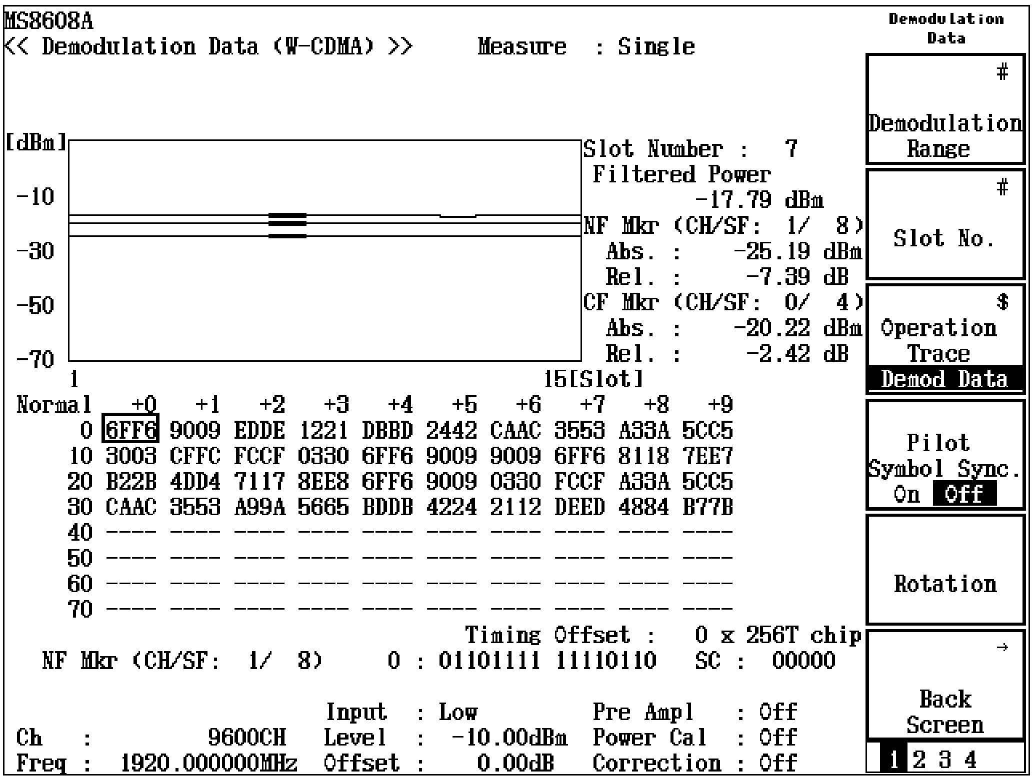
Pressing [F1] (Demodulation Data) in the second page of the function label on the Setup Common Parameter screen displays the Demodulation Data screen.
The section describes the measured result to be displayed on the Demodulation Data screen (demodulation data), setting parameter, and cautions on use.
Note that this function is available only for MX860x01B/MX268x01B.

Explanation of Measured Results

This section describes the measured result to be displayed in the Demodulation Data screen (demodulation data). Press [F5] (Adjust Range) to perform optimization before hand the measurement in order to stabilize the measuring instrument. For details on Adjust Range, refer to “Optimizing Measurement Range (Adjust Range).”

Measured result

(when Measuring Object is set to Down Link (Compress))



Measured results consist of two parts.
Upper part of the screen indicates the Code vs Time waveform. That is the plotted power for each slot of code channel to be modified. For the Code vs Time waveform, refer to “Measuring Code Power for Each Slot”. The power of the Code vs Time waveform on the Demodulation Data screen does not necessarily match the one on the Demodulation Analysis screen. It is because the calculation procedure is simplified on the Demodulation Data screen since its priorities are to indicate code levels visually and shorten measurement time. Therefore, when you need to measure the accurate power of the Code vs Time waveform, carry out the measurement on the Modulation Analysis screen.
Lower part of the screen displays the demodulation data of slot at the point of marker of the Code vs Time waveform locates.

Demodulation data:

Displays the Symbol Data that is de-spreading. It is displayed in hexadecimal separated by 2 byte steps. There are labels above and left-hand the data for visibility that has nothing to do with the demodulation data. Demodulation data is to be displayed over multiple pages when it does not fit in one page.

SF:

Displays the Spreading Factor to be modulated.

CH:

Displays the channelization code to be modulated.

Marker:

Displays the demodulation data with quadrilateral marker in binary.

SC:

Displays the scramble code used for the demodulation.

Timing Offset:

Displays the Timing Offset.

Setting Demodulation Channel

This section describes procedure of setting the demodulation channel. Press [ ] (More) on the Demodulation Data screen to display the second page of function labels. The following setting items appear:

- CF Marker Mode
- Setup Channel
- Spreading Factor
- Channelization Code
- Compressed Frame SC

Refer to “Setting the Code vs Time Waveform” for details on the settings shown above.

When Down Link (Compress) is selected for Measuring Object, setting items for channel of modulation data to be displayed appear.

Setting the channel of modulation data to be displayed

1. Press [ ] (More) to display the third page of the function labels.
2. Press [F3] (Demod Channel)to toggle between NF (Normal Frame) and CF (Compressed Frame).

Setting Demodulation Data Range

Data can be modulated up to 10 frames.

Setting the number of data to be modulated

1. Press [F1] (Demodulation Range) on the Demodulation Data screen to display the setting window.
2. Enter the modulation data range using the rotary knob or [∧] [∨] (Entry Key).
3. Press [Set] to confirm.

Demodulation Data and Phase

Pilot Symbol Synchronization On/Off is to be set for demodulation. Selecting Off disables initial phase to be determined so that data rotates on the IQ plane. With the signal has no pilot symbol, this function is useless.

Setting the Pilot Symbol synchronization

1. Press [ ] (More) to display the second page of the function labels.
2. Press [F4] (Pilot Symbol Sync) to toggle alternately between Pilot Symbol Synchronization On/Off. (setting to On enable Pilot Symbol Synchronization).

When the pilot symbol synchronization is not enabled, data spins on the IQ surface. There is function to rotate data by 90 degrees on the surface.

How to rotate data is explained below:

1. Press [ ] (More) to display the second page of function labels.
2. Press [F5] (Rotation) to rotate data by 90 degrees on the IQ surface. Pressing four times returns to the original position.

Operating Marker

The Demodulation screen is used to display the Code vs Time waveform and modulation data. This section explains how to operate the marker. The following explanations are given assuming that the first page of function label has been displayed on the Demodulation screen.

Changing the Operation Trace (Operation Trace)

1. Press [F3] (Operation Trace) and toggle alternately between Code vs Time and Demod Data to select the Operation Trace.

Moving the marker of Code vs Time waveform (Slot No)

1. Press [F2] (Slot No) to display the setting window.
2. Entry the slot number using the rotary knob or [∧] [∨] (Entry Key).
3. Press [Set] to confirm.

The marker of the Code vs Time Waveform can be operated by the rotary knob or [∧] [∨] (Entry Key) when Operation Trace is set to Code vs Time.

Specifying Refreshment (Refresh Wave Memory)

Sets whether to refresh the waveform to analyze it.

Setting procedure

1. Press [ ] (More) to display the third page of the function label.
2. Press [F2] (Refresh Wave Memory) to select On/Off to set whether to refresh and analyze the waveform.

The current signal data is demodulated when Refresh Wave Memory is set to Off. A signal data is newly loaded into the MS860x/MS268x and demodulated when set to On.

This setting item is set to On when Demodulation Range is changed.

Saving Demodulation Data to a File

Save the demodulation data to a file in a memory card.

Saving procedure

1. Press [ ] (More) to display the fourth page of function labels.
2. Press [F1] (Write Demodulation Data) to open a function label.
3. Press [F2] (Data Format) to set the format for the saving file.
   - HEX: Saves demodulation data in hexadecimal format.
   - BIN: Saves demodulation data in binary format.
4. Press [F1] (Write Demodulation Data) to save demodulation data to a memory card.

Setting Timing Offset value

Sets the timing offset value.

1. Press [ ] (More) to display the fourth page of the function labels.
2. Press [F2] (Timing Offset) to open a setting window.
3. Press [∧] [∨] entry keys or turn the rotary knob, or use numeric keypad to input Timing Offset value.
4. Press [Set] to confirm.

Demodulating signals applied by Transmit Diversity

Closed Loop Mode, a type of Transmit Diversity, is a method to control the transmit symbol phase from both antennas so as to reduce the fading. By determining phase with the use of DPCCH pilot bits, this function displays the demodulation data compliant with phase control in Closed Loop Mode.

This function is available when Measuring Object is set to Down Link or Down Link (Compress).

Setting Closed Loop Mode

1. Press [ ] (More) to display the fourth page of function labels.
2. Press [F1] (Closed Loop Mode Setup) to open the Closed Loop Mode Setup function labels.
3. Press [F1] (Closed Loop Mode) to select Closed Loop Mode applied for input signals.
   - Off: does not perform the determination of phase control in any Closed Loop Mode.
   - Mode 1: displays the demodulation result compliant with phase control in Closed Loop Mode 1.
   - Mode 2: displays the demodulation result compliant with phase control in Closed Loop Mode 2.
4. Press [Set] to confirm.

When using this function, Slot Format Number of target Code Channel needs to be set.

Setting Slot Format Number

1. Press [ ] (More) to display the fourth page of function labels.
2. Press [F1] (Closed Loop Mode Setup) to open the Closed Loop Mode Setup function labels.
3. Press [F2] (Slot Format) to select Slot Format Number of target Code Channel.
4. Press [Set] to confirm.

When Measuring Object is set to Down Link (Compress), Slot Format Number of target Code Channel in compressed frame needs to be set as well.

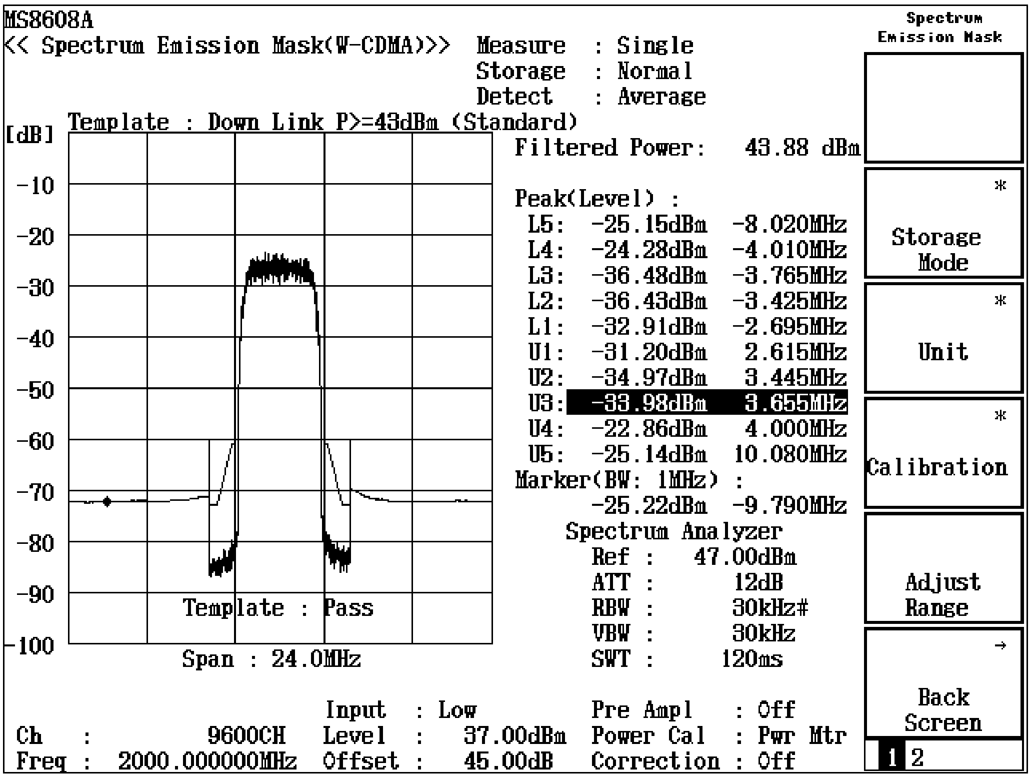
Setting Slot Format Number in compressed frame

1. Press [ ] (More) to display the fourth page of function labels.
2. Press [F1] (Closed Loop Mode Setup) to open the Closed Loop Mode Setup function labels.
3. Press [F3] (CF Slot Format) to select Slot Format Number of target Code Channel.
4. Press [Set] to confirm.

Measuring Spectrum Emission Mask

This section explains the measured results and setting parameters shown on the Spectrum Emission Mask screen.

Explanation of screen



Waveform display

Displays the spectrum waveform with the horizontal and vertical axes representing the frequency and level, respectively. Measures Offset below 4.0 MHz with RBW 30 kHz while measuring Offset below 4.0 MHz or more with RBW 1 MHz.

Filtered Power/Tx Power

Displays the average power for a single slot of the measured signal filtered through the filter of each frequency band of the template in dBm units. Select the filter to be used in Filter Type.

Peak (Level) / Peak (Margin)

Displays Level/Margin of measured point of minimum margin at each frequency band of the template. When the measured waveform exceeds the template, “F” is displayed at the left each template. Select Level/Margin in Display Data Type.

Changing Detection Mode (Detect Mode)

The procedure to change the detection mode is shown below.

Selecting the detection mode

1. While Spectrum Emission Mask screen is displayed, press F1 (Set up Spectrum Analyzer) on the second page of the Spectrum Emission Mask function labels.
2. Press F5 (Detection) on the third page of the Setup Spectrum Analyzer function labels.
3. The detection mode selection window opens.
4. Press ∧ ∨ Entry Keys or turn the rotary knob to move the cursor to the item to be set.
5. Press Set to confirm.

When setting is completed, the detection mode is changed and the selected mode appears in the Detect display area on the upper right. Select one from the following detection modes:

- Positive Peak: Traces the maximum value among the sample points.
- Sample: Traces the short term value among the sample point.
- Negative Peak: Traces the minimum value among the sample points.
- Average: Traces the average value among the sample points.
- RMS: Traces the RMS value among the sample points. This is an optional function.

Displaying Marker

In the Spectrum Emission Mask screen, a marker can be displayed on the waveform.

Displaying marker, Method 1

1. Press Marker to display the Marker function label.
2. Press F1 (Marker) to switch between Normal and Off.

Displaying marker, Method 2

1. Press (More) to display the second page of the function label.
2. Press F3 (Marker) to switch between Normal and Off.

When set to Normal, a diamond marker (◆) appear on the waveform.

Changing Unit of Measured Value (Unit)

This section explains how to change the unit for the marker value.

Setting the unit display

Press [F3] (Unit) on the Spectrum Emission Mask screen to display the following function labels, then select a unit.

- [F1] (dBm): Displays the power value in dBm units.
- [F2] (mW): Displays the power value in mW units.
- [F3] (uW): Displays the power value in uW units.
- [F4] (nW): Displays the power value in nW units.
- [F5] (dB): Displays the power value in dB units.
- [F6] (return): Returns to the previous function-label display.

The display unit is fixed to mW/uW/nW because changing the unit by marker operation marks finding the size relationship among the markers difficult. When the measured value exceeds the display digits, 999.999 (999 when nW is selected) is displayed. 0.000 is displayed when it is under the display digits.

Averaging Measured Results (Storage Mode)

This section explains the storage mode through the setting of the averaging process for measured results.

Setting average process

1. Press [F2] (Storage Mode) on the Spectrum Emission Mask screen to display the Storage Mode function label.
2. Press [F2] (Average Count) to open the setting window.
3. Press [∧] [∨] Entry keys, turn the rotary knob or use the numeric keypad to input the average count.
4. Press [Set] to confirm.
5. Then press [F1] (Storage Mode) in the Storage Mode menu.
6. A selection window opens.
7. Press [∧] [∨] (Entry keys) or turn the rotary knob to select Average.
8. Press [Set] to confirm.

When setting is completed, another measurement starts.

When the average count is changed while the storage mode is set to Average, a measurement is also performed after setting completion. When no value is changed or when Cancel is selected, measurement is not performed.

Refresh Internal: Sets the updating interval for the average value displayed.

- Every: Updates the display after each measurement.
- Once: Updates the display after measurements is repeated by the set average count.

The following options are also available for the storage mode:

- Normal: Updates and displays the measured results after each measurement.
- Average: Averages and displays the measured results after each measurement.

Averaging is performed by using the power value. That is, a measured waveform is first converted into the power value, which is then averaged together with the power value of previously measured waveforms. Then, the result is turned into the form of the dBm value, and a waveform is drawn.

Setting Measurement Parameters

This section explains the measurement parameters required for the Spectrum Emission Mask measurement.
It is described below as the second page of the function label is displayed on the Spectrum Emission Mask screen.

Selecting Display Type

Press F4 (Display Type) to switch between Level and Margin, alternately.

- Level: Displays Level on the measured point of minimum margin to the template of each frequency band.
- Margin: Displays Margin on the measured point of minimum margin to the template of each frequency band. (This setting is fixed to dB regardless of Unit setting).

Selecting Filter Type

Press F5 (Filter Type) to switch between Filtered Pwr and Tx Power, alternately.

- Filtered Pwr: Displays the average power for a single slot of the measured single passed through the RRC filter in dBm unit.
- Tx Power: Displays the average power for a single slot of the measured signal in dBm unit. This value is the same as that displayed on the Transmitter Power (Transmitter Power measurement) screen.

Setting SPA Parameters

At the Spectrum Emission Mask screen, the following SPA sweep parameters can be changed.

- ATT, Ref Level Mode Auto/Manual

  Auto: Sets the attenuator and reference level to their optimum inside the measuring instrument corresponding to the RF input level (Reference Level) set in the Setup Common Parameter screen.

  Manual: Sets the attenuator and reference level manually.

- Ref Level

  Sets the reference level for SPA sweeping.

- Attenuator

  Sets the attenuator for SPA sweeping.

- Attenuator Auto/Manual

  Auto: Automatically sets the attenuator corresponding to the reference level for SPA sweeping.

  Manual: Sets the attenuator for SPA sweeping manually.

- RBW Mode

  Sets the RBW to digital or analog filter. When digital filter is set, RMS detection is added to the detection modes.

- VBW

  Sets the VBW for SPA sweeping.

- VBW Auto/Manual

  Sets the VBW corresponding to RBW automatically (Auto) or manually (Manual).

- VBW/RBW ratio

  Sets the VBW setting for when VBW Auto is selected using this parameter.

- Sweep Time

  Sets the SPA sweep time.

- Sweep Time Auto/Manual

  Sets the sweep time automatically (Auto) or manually (manual) corresponding to set parameters.

- Detection

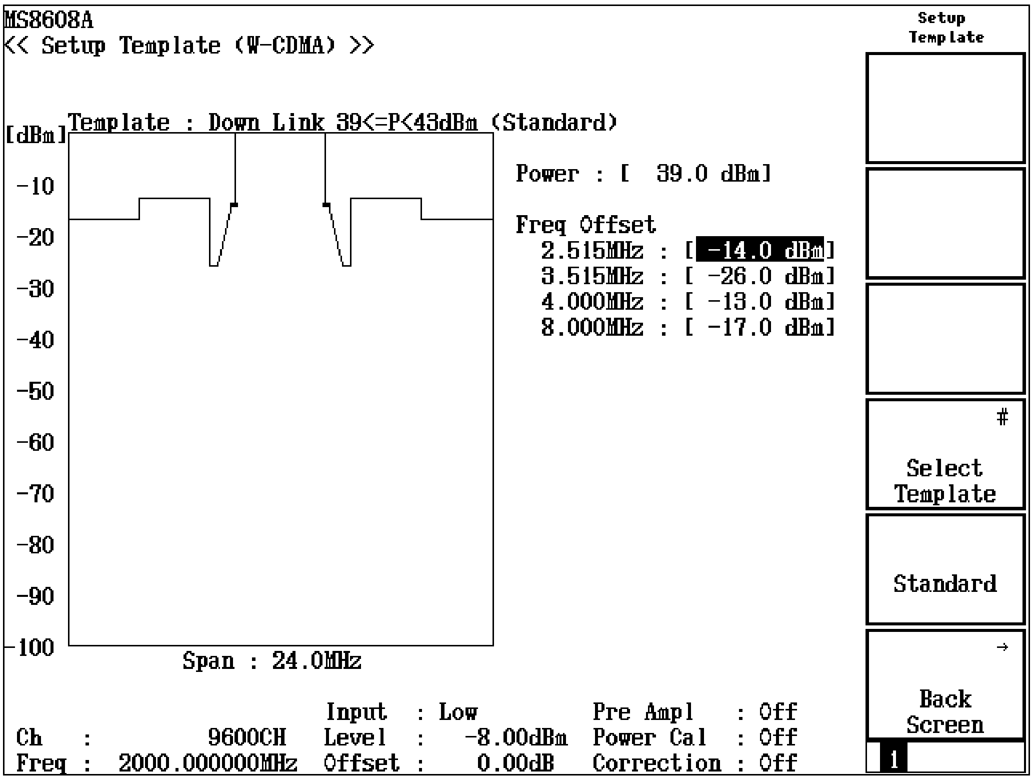
  Sets the detection mode for SPA sweeping.

Setting Template (Setup Template)

This section explains how to set the template.

Setting the Setup Template display

1. While the Spectrum Emission Mask screen is displayed, press F2 (Setup Template) on the second page of the Spectrum Emission Mask function label.
2. The Setup Template screen (shown below) appears.



Setting the template

1 Press ∧ ∨ (Entry keys) or turn the rotary knob to select the Freq Offset level.

2. Set the level by using the numeric keypad. The level can also be set by pressing Set in the Entry key.

When Set key is pressed:

3. The level changing line appears.
4. Press ∧ ∨ (Entry keys) or turn the rotary knob to set the level changing line to desired level.
5. Press Set to confirm.

When setting is completed, the set level becomes valid.

Setting the template type

Press F4 (Select Template) to switch the template type between Up Link, Down Link (P >= 43 dBm), Down Link (39 <= P < 43 dBm), Down Link (31 <= P < 39), and Down Link (P < 31 dBm).

- Up Link
- Down Link (P >= 43 dBm)
- Down Link (39 <= P < 43 dBm)
- Down Link (31 <= P < 39 dBm)
- Down Link (P < 31 dBm)

Setting Power

Set power when the template is set to Down Link (39 <= P < 43) or Down Link (31 <= P < 39 dBm) in Select Template.

1 Press ∧ ∨ (Entry keys) or turn the rotary knob to select Power.

2. Set the level using the numeric keypad.

When the setting is completed, the level of Freq Offset is changed in accordance with 3GPP TS25.141.

Initializing the template

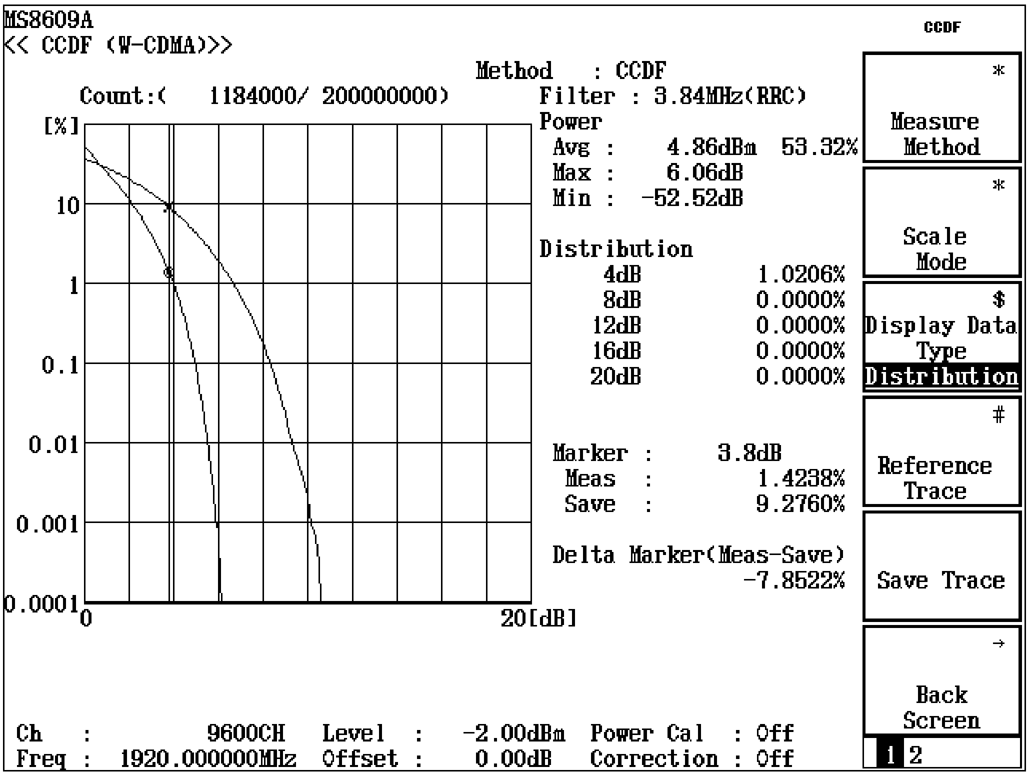
Press F5 (Standard) to return the template level to the initial setting value.

Measuring CCDF

This section describes the measured results and setting parameter related to the CCDF (Complementary Cumulative Distribution Function) screen.
Note that this function is available only for MX860x01B/MX268x01B.

Explanation of Measured Results

The following display appears when CCDF is selected for Measure Method.



Method:

Displays the measurement method selected for Measure Method. Refer to Section "Selecting Measurement Method" for details on setting.

Waveform:

Displays the cumulative distribution of the average power band-limited by Filter and the instantaneous power. The horizontal axis indicates the difference between the average value and instantaneous power; the vertical axis indicates distribution.
Refer to "Setting Display Method" for details on setting.

Count:

Displays the measurement point as count currently being measured/total count.

Filter:

Displays the band of Filter used for analysis. Refer to "Setting for Measurement" for details on setting.

Power:

Displays the relative values of Average Power, Maximum Power, and Minimum Power of the measurement point. It also displays the cumulative ratio of Average Power (unit: percent).

Distribution:

Displays the cumulative distribution of which above deviation at the grid. Refer to "Setting Display Method" for details on setting.

Marker:

Displays the cumulative distribution of which above deviation at the marker. Refer to "Setting Display Method" for details on setting.

Delta Marker:

Displays the difference between the data saved in Reference Trace and the waveform being measured. Refer to "Setting Display Method" for details on saving/displaying Reference Trace.

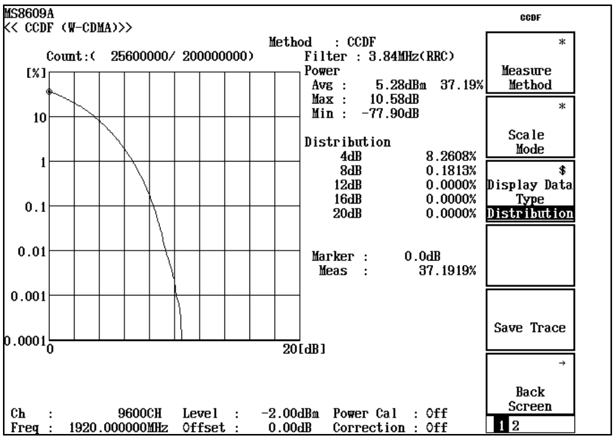
Selecting Measurement Method

This section describes how to select the Measurement Method. The description advances assuming that the first page of function label is being displayed on the CCDF screen.

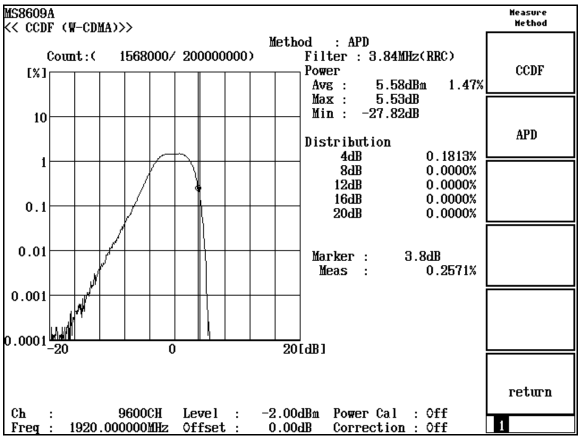
Press [F1] (Measure Method) to display the function labels shown below that allows you to select the Measurement Method.

- [F1] (CCDF): Measures and displays CCDF (Complementary Cumulative Distribution Function). In this measurement, the cumulative distribution of the deviation of average power and instantaneous power is to be measured and displayed.
- [F2] (APD): Measures and displays APD (Amplitude Probability Density). In this measurement, displays the deviation of average power and instantaneous power.
- [F6] (return): Returns to the previous function label.

When Measuring Method is changed, re-measurement is to be carried out.



Measure Method : CCDF



Measure Method : APD

Setting Display Method

This section describes the Display Method of the measured results. The description advances assuming that the first page of function label is being displayed on the CCDF screen.

Selecting Trace Format

1. Press [F2] (Scale Mode) to display the function label.
2. Press [F1] (Trace Format) to display the setting window.
3. Select “Trace Format” using [∧] [∨] (Entry keys) or the rotary knob.
4. Press [Set] to confirm.

The following modes are selectable for Trace Format:

- Positive: Displays the distribution of which above Average Power
- Negative: Displays the distribution of which below Average Power
- Positive & Negative: Displays all distribution

This function is available only when APD is set for Measure Method.

Selecting Horizontal Scale

1. Press [F2] (Scale Mode) to display the function label.
2. Press [F2] (Horizontal Scale) to display the function labels shown below that allows you to select Scale.

- [F1] (2 dB): Sets the maximum value to 2 dB
- [F2] (5 dB): Sets the maximum value to 5 dB
- [F3] (10 dB): Sets the maximum value to 10 dB
- [F4] (20 dB): Sets the maximum value to 20 dB
- [F5] (50 dB): Sets the maximum value to 50 dB
- [F6] (return): Returns to the previous function label.

Selecting Display Data Type

1. Press F3 (Display Data Type) to toggle between Probability and Distribution.

Display Data Type is a function to display the value of measured waveform of which the grid locates on either vertical axis or horizontal axis. The following modes are selectable:

- Probability: Displays the distribution of measured waveform at the specified probability (at the grid on the vertical axis). The marker moves along the vertical axis.
- Distribution: Displays the probability of measured waveform at the specified distribution (at the grid on the horizontal axis). The marker moves along the horizontal axis.

Saving the measured waveform

1. Press F5 (Save Trace).
2. When the confirmation widow appears, select "Yes" and press Set to confirm.

This function saves only selected waveform for Measure Method.

Selecting "Reference Trace"

1. Press F3 (Displays Data Type) toggles between "Probability" and "Distribution".
2. Select "Reference Trace" by using ∧ ∨ (Entry keys) or the rotary knob.
3. Press Set to confirm.

Measured waveform and Gauss distribution saved by selecting “Reference Trace” are available to be displayed simultaneously.

- Off: Displays waveform currently being measured.
- Save Trace: Displays waveforms both currently being measured and being saved.
- Gaussian Trace: Displays waveform both currently being measured and gauss distribution.
- Save & Gaussian: Displays waveforms both currently being measured and being saved, and gauss distribution.

Gaussian Trace and Save & Gaussian is valid only when Measure Method is set to CCDF.

Setting for Measurement

This section describes the settings required for the CCDF measurement. The description advances assuming that the second page of function label is being displayed on the CCDF screen.

Selecting Filter Type

1. Press [F1] (Filter Type) to display the setting window.
2. Select "Filter Type" by using [∧] [∨] (Entry keys) or the rotary knob.
3. Press [Set] to confirm.

The following Filters are selectable for Filter Type:

- 20 MHz, 10 MHz, 5 MHz, 3 MHz
- 3.84 MHz (RRC): α = Root Raised Cosine Filter of 0.22
- 3.84 MHz (RC): α = Raised Cosine Filter of 0.22

Selecting Data Count

1. Press [F2] (Data Count) to display the setting window.
2. Enter the measurement point by using [∧] [∨] (Entry keys), the rotary knob, or the numeric keypad.
3. Press [Set] to confirm.

Selecting Analysis Length

1. Press [F3] (Analysis Length) to display the setting window.
2. Enter the analysis length by using [∧] [∨] (Entry keys), the rotary knob, or the numeric keypad.
3. Press [Set] to confirm.

Analysis Length is a measurement section required for one measurement. The data started from the set Analysis Length is to be measured up to the set Data Count value.

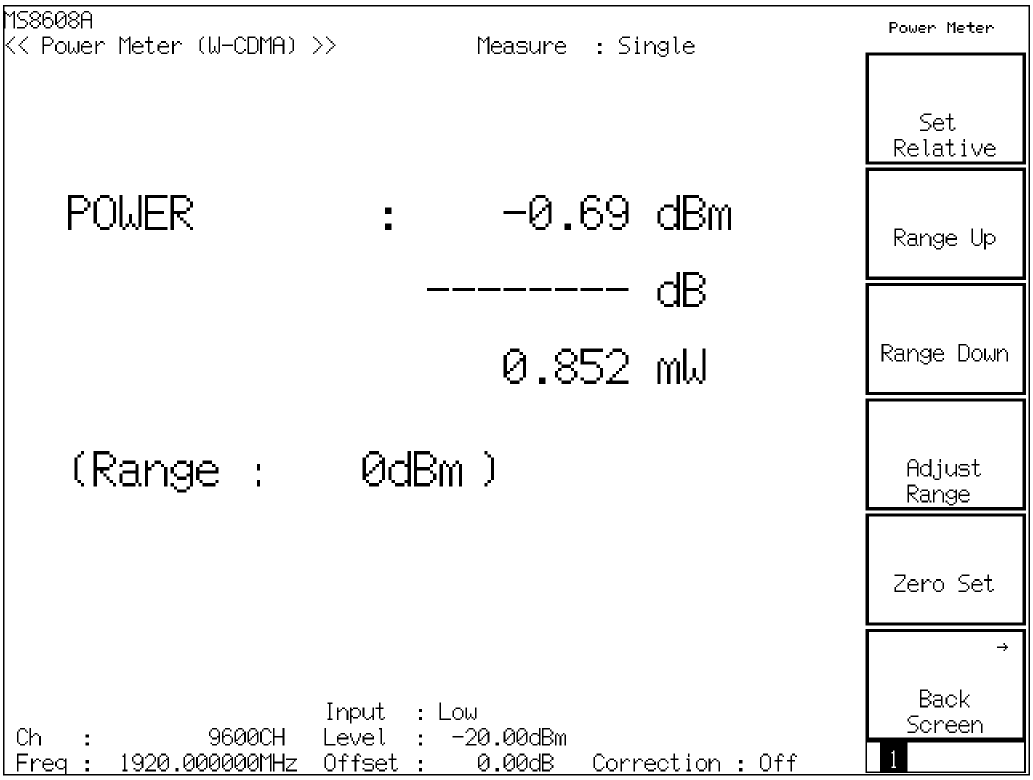
Power Meter

For MS860x, press [F6] (Power Meter) on the second page of the function label on the Setup Common Parameter screen, to move to the Power Meter screen.
This section explains the measured results and setting parameters shown on the Power Meter screen (power meter), as well as operation cautions.
Note that this Power Meter measurement cannot be performed during IQ input.
For MS268x, This function is not available.

Explanation of Measured results

This section explains the measured results shown on the Power Meter screen.
Press [F5] (Adjust Range) to optimize the level setting in the transmitter tester before measurement.
See “Optimizing Measurement Range (Adjust Range)” section for more information.

Measured Results



POWER

Displays the power measured with the built-in power meter in absolute power: dBm, relative power: dB and absolute power: W system. The measured value when F1 (Set Relative) is pressed becomes the reference (0 dB) for the relative power in dB unit.

Range

Displays the current measurement range.

Performing Zero Point Calibration (Zero Set)

Be sure to always perform the zero-point calibration before you use the power meter. Set the RF input connector to no power, and press [F5] (Zero Set) in order to perform the zero-point calibration.
If you do not perform the zero-point calibration, the measured value by the power meter may be incorrect.

Using Relative Value Display (Set Relative)

This section explains how to use the relative value display.

Press [F1] (Set Relative) to set the current power to the reference value (0 dB), and display the relative value compared to this reference value.

Setting Measurement Range (Range Up / Range Down)

This section explains how to set the measurement range of the power meter.

Measurement ranges

Measurement ranges are as follows.

For MS8608A High Power Input

0 dBm, +10 dBm, +20 dBm, +30 dBm, +40 dBm

For MS8608A Low Power Input and MS8609A

−20 dBm, −10 dBm, 0 dBm, +10 dBm, +20 dBm

Setting Measurement Range

- Press [F2] (Range Up) to increase the measurement range.
- Press [F3] (Range Down) to decrease the measurement range.
- Press [F4] (Adjust Range) to optimize the measurement range in accordance with the signal input level.

See “Optimizing Measurement Range (Adjust Range)” section for more information.

Measuring IQ Level

Press F2 (IQ Level) on the second page of the function on the Setup Common Parameter screen, in order to move to the IQ Level measurement screen.

This section explains the measured results and setting parameters shown on the IQ Level screen (IQ level measurement), as well as operation cautions.

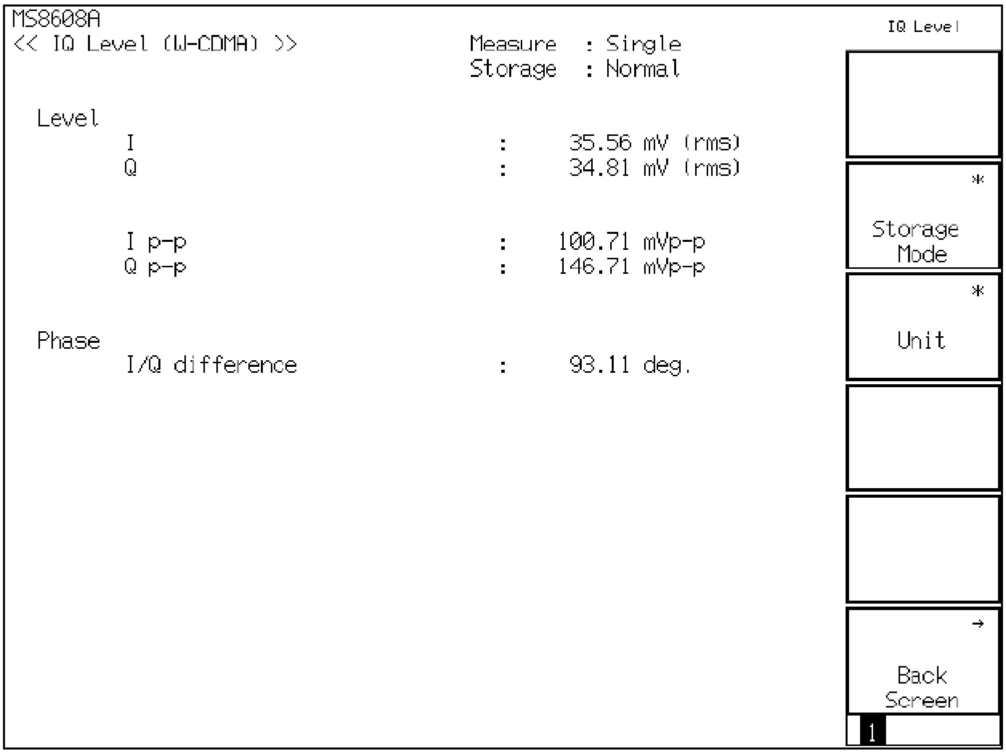
Note that this IQ level measurement cannot be performed during any measurement with RF input signal.

For MS 268x, this function is available when MS2681A/MS2683A-17, -18 or MS2687A/B-18 is installed.

Explanation of Measured Results

This section explains the measured results shown on the IQ Level screen (IQ level measurement).

Measurement result



Level (I and Q)

Displays the levels of the effective values for the I-phase signal and Q-phase signal in mV or dBmV units.

Level (I p-p and Q p-p)

Displays the peak-to-peak levels for the I-phase signal and Q-phase signal in mV or dBmV units.

Phase (I/Q difference)

Displays the phase difference between the I-phase signal and Q-phase signal in deg. unit, when CW (continuous) signals of the same frequency are input to the I-phase input and Q-phase input. This is used for orthogonality measurement using the orthogonal demodulator.

Averaging Measured Results (Storage Mode)

This section explains the storage mode of the I/Q level measurement through the setting of averaging process for measured results.

Setting the averaging process

1. Press [F2] (Storage Mode) on the IQ Level screen to display the Storage Mode function label.
2. Press [F2] (Average Count) to open a setting window.
3. Press [∧] [∨] Entry keys or turn the rotary knob, or use the numeric keypad to input the number of averaging processes.
4. Press [Set] to confirm.
5. Then, press [F1] (Storage Mode) in the Storage Mode menu.
6. A selection window opens.
7. Press [∧] [∨] Entry keys or turn the rotary knob to select Average.
8. Press [Set] to confirm.

When the setting is completed, another measurement is made.
When the number of average processes is changed while the storage mode is set at Average, a measurement is also performed after completion of the setting.
When no values are changed or when Cancel is selected, no measurements are made again.

Refresh Interval: Sets the interval for updating average value displayed.

- Every: Updates the display after every measurements.
- Once: Updates the display after a measurement is repeated by the set number of averaging processes.

The following options are also available for storage mode:

- Normal: Updates and displays the measured results after every measurements.
- Average: Averages and displays the measured result after every measurements.

Changing Unit of measured Result (Unit)

This section explains how to change the unit for the IQ-level measured results.

Setting the unit display

Press [F3] (Unit) on the IQ Level screen to display the following function labels, and select a unit.

- [F1] (mV): Displays the measured results in mV units.
- [F2] (dBmV): Displays the measured results in dBmV units.
- [F6] (return): Returns to the previous function-label display.

Saving and Recalling Setting Parameters

This section explains how to save the set parameter values in a memory card, and how to recall them from the card.

Insert a memory card into the memory-card insertion slot before saving or recalling the set parameter values.

The memory card can be inserted or removed only when the power is On. However, be sure not to insert or remove the memory card when saving or recalling in progress.

A single memory card can hold 100 types of settings (files). These files are saved in file No. 0 through 99.

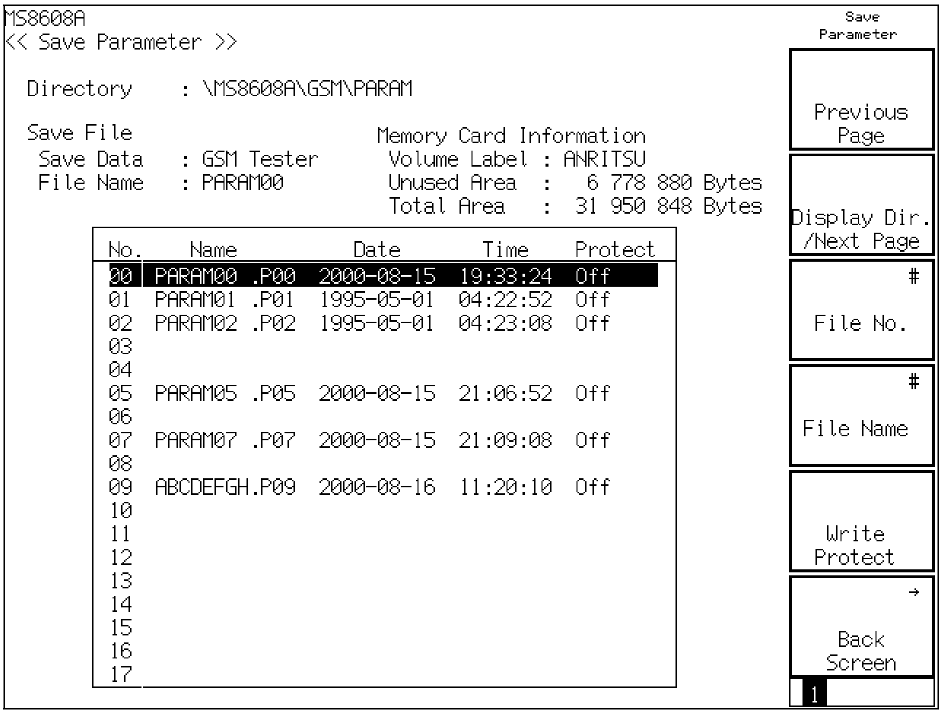
In addition, a file name using alphanumeric characters can also be created if necessary, and write-protect can be set.

Since the file is MS-DOS formatted; the file name can contain up to eight characters, and no differentiation can be made between upper-case and lower-case characters.

Saving Parameters (Save)

To save parameters, display the Save Parameter screen by the following procedures.

1. Insert a memory card into the memory-card insertion slot.
2. Press [Shift] and then press [Recall].
3. Press [F2] (Display Dir.).



A single memory card can hold 100 types of settings (files). These files are saved in file No. 0 through 99.

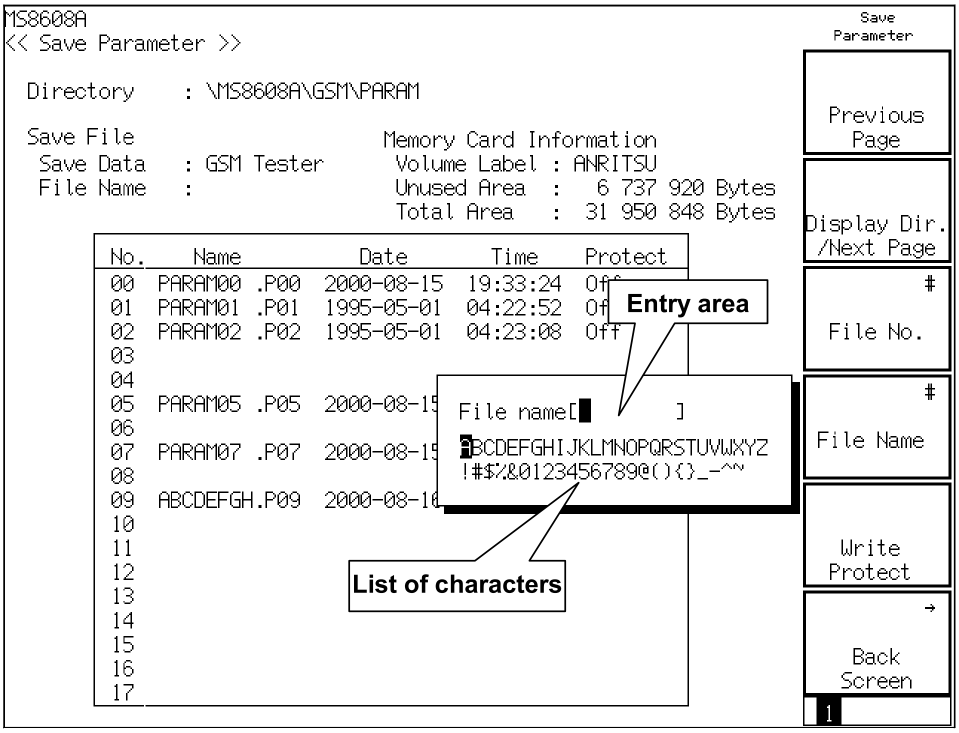
4. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor and select a file No..
   Or, press [F3] (File No.) to open a setting window, and input a file No. using numeric keypad.
5. Press [Set] Entry key.
6. Then, a confirmation window opens, select “Yes” and press [Set] to confirm.

Through the above procedures, the value set for each parameter is saved into a memory card. When a file is saved under a new file number, a file name, “PARAM**.P**” (**representing the file No.), is automatically assigned. When a file is saved under a file number already assigned, the file is overwritten under the same name.

Saving File under Different Name (File Name)

Press [F4] (File Name) as the fourth step of the parameter saving procedure to save a file under a new name.

This section explains how to input a new file name after pressing [F4] (File Name).



Procedure for inputting file name

1. Turn the rotary knob to move the cursor on the list of characters, and select a character you wish to input.
2. Press [Enter]. The selected character is input into the entry area.
3. Repeat Step 2 above to completely input a file name.
   Alphanumeric characters, A through F, and 0 through 9, can also be input from the numeric keypad directly.
   A file name can contain up to eight characters. Only characters displayed on the list of characters can be used. Other characters cannot be used.
4. Press [Set] when you have finished inputting a file name.
5. When a confirmation window opens, select "Yes" and press [Set] to confirm.

Through the above procedures, a file is saved under the new name.

- Rotary knob: Moves the cursor on the list of characters.
- [∧] [∨] : Moves the cursor in the entry area.
- [BS] : Deletes a character before the cursor in the entry area.
- [Enter] : Enters a character (located at the cursor position on the list of characters) to the cursor position in the entry area.
- [Set] : Sets a character string in the entry area as a file name.

Write-protecting file (Write Protect)

This section explains how to set the write-protect on a file.

1. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor to the file number you wish to set write-protect on.
2. Press [F5] (Write Protect).

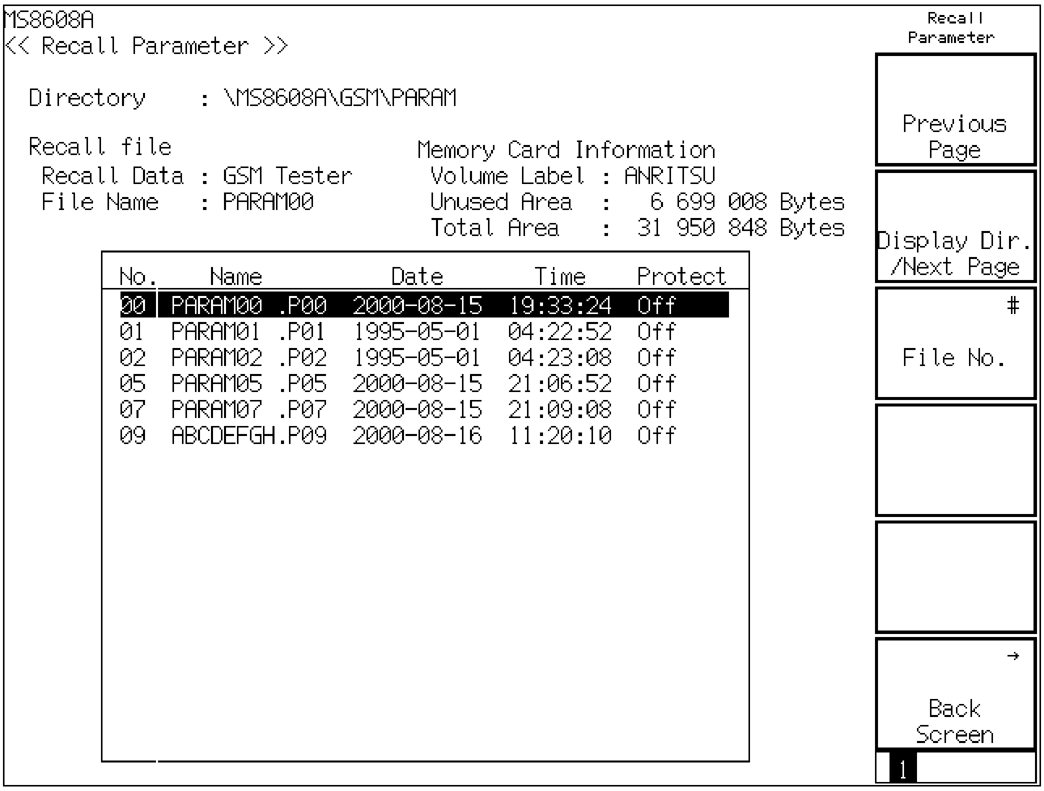
Every time [F5] (Write Protect) is pressed, write-protect is set to On or Off, alternatively.

Recalling Parameters (Recall)

To recall the saved parameters, display the Recall Parameter screen at first by the following procedures.

Insert a memory card into the memory-card insertion slot, and then perform the followings.

1. Press [Recall].
2. Press [F2] (Display Dir.).



3. Press [∧] [∨] Entry keys or turn the rotary knob to move the cursor and select a file No.
   Or, press [F3] (File No.) to open the setting window, and input a file No. using numeric keypad.
4. Press [Set] Entry key.
5. When a confirmation window opens, select "Yes" and press [Set] to confirm.

When this procedure is completed, the screen returns to the Setup Common Parameter screen.

Section 4 Performance Test

This section provides the explanation of the measuring instruments, the setup, and operation for performance test for the W-CDMA measurement, when the MX860x01A/MX860x01B/MX268x01A/MX268x01B is installed on the MS860x (transmitter tester)/MS268x (Spectrum Analyzer).
The items enclosed in the brackets [ ] in this section indicate the panel keys.

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When Requiring Performance Test

The performance test explained here is implemented as part of the preventive maintenance against performance deterioration when MX860x01A/MX860x01B/MX268x01A/MX268x01B, installed on MS860x (transmitter tester)/MS268x (Spectrum Analyzer), is used for W-CDMA measurement.

You are advised to implement a performance test on the MX860x01A/MX860x01B/MX268x01A/MX268x01B when necessary, for example, upon incoming acceptance inspection, regular inspection and post-repair performance confirmation.

Be sure to implement performance tests below for items considered important as preventive maintenance (once or twice a year is considered ideal).

- Modulation/Frequency measurement
- Code domain measurement
- Transmitter power measurement accuracy
- Linearity
- Occupied bandwidth measurement
- Adjacent channel leakage power measurement
- Spurious measurement
- CCDF measurement
- IQ input modulation accuracy
- Power meter accuracy*

  *For MS268x, this test is not performed.

If you have found an item which does not meet specifications during a performance test, please contact Anritsu or one of our dealers.

List of Equipment for Performance Test

The table below lists equipment to be used for the performance test.

Recommeneded Model (Model name)	Required Performance	Test Item
Digital modulation signal generator (MG3681A with MX368041) 2 units used	• Frequency range: 10 MHz to 3 GHz Resolution 1 Hz min. • Output level range When un-modulated: −10 to 12 dBm When modulated: −10 to 4 dBm Resolution 0.1 dB min. • External reference input: 10 MHz enable • 16 ch multiplexing enable • Residual vector error: 2.0% or less, typical	Modulation/Frequency measurement Code domain measurement Transmitter power measurement accuary Linearity Occupied bandwidth measurement Adjacent channel leakage power measurement Spurious measurement IQ input modulation accuracy Power meter accuracy
Calibration receiver (ML2530A)	• Frequency range: 100 kHz to 3 GHz Resolution 1 Hz min. • Measurement power range: −140 to 20 dBm • Measurement accuracy: ±0.04 dB • The external reference input: 10 MHz enable	Modulation/Frequency measurement Linearity Power meter accuracy
Power meter (ML4803A) Power sensor (MA4601A)	• Accuracy of power indicator: ±0.02 dB • Frequency range: 100 kHz to 8.5 GHz (depending on the power sensor used) • Frequency range: 10 MHz to 3 GHz • Measurement power range: −30 to +20 dBm • Input connector: Type N	Transmitter power measurement accuracy Linearity Power meter accuracy
Power meter (ML2437A)	• Accuracy of power indicator: ±0.02 dB • Frequency range: 100 kHz to 8.5 GHz (depending on the power sensor used)	Modulation/Frequency measurement Transmitter power measurement accuracy Linearty
Power sencor (MA2421A)	• Frequency range: 10 MHz to 3 GHz • Measurement power range: −30 to +20 dBm • Input connector: Type N	Code domain measurement Adjacent channel leakage power measurement
Fixed attenuator (MP721A)	• Attenuation: 3dB • VSWR: 1.2 or less	Power meter accuracy

Recommeded Model (Model name)	Required Performance	Test Item
Fixed attenuator (MP721D)	• Attenuation: 20 dB • VSWR: 1.2 or less	Transmitter power measurement accuracy
Programmable attenuator (MN72A)	• Frequency range: DC to 18 GHz • Attenuation accuracy: 0.9 dB • VSWR: 1.2 or less	Modulation/Frequency measurement Power meter accuracy Linearty
2-signal pad	• Frequency range: 50 MHz to 3 GHz	Modulation/Frequency measuremnt
Power divider (1091-29)	• Frequency range: 50 MHz to 3 GHz	Modulation/Freauency measurement
Power splitter	• Frequency range: 50 MHz to 3 GHz	Modulation/Freauency measurement
2-GHz LPF	• Can cut off higher-harmonic signals in excess of 2 GHz generated by the signal generator.	Spurious measurement

Required performance listed above is part of the performance to cover the measurement range for test items.

Performance Test <MS860x>

Unless otherwise specified, be sure to warm up the device under test (DUT, MS8608A/MS8609A with MX860801A/MX860801B/MX860901A/MX860901B) to be tested and the measuring instruments for at least 30 minutes or over until they become stable, before implementing the performance test.

To ensure the maximum measurement accuracy, we recommend that you observe the above as well as keeping the room temperature at 25±5℃, limiting AC voltage fluctuations to a minimum, and making sure that there are no problems with noise, vibration, dust, humidity or other environmental factors.

Modulation/Frequency Measurement <MS860x>

This section tests the following specifications.

- Carrier frequency accuracy
- Residual vector error
- Origin offset accuracy

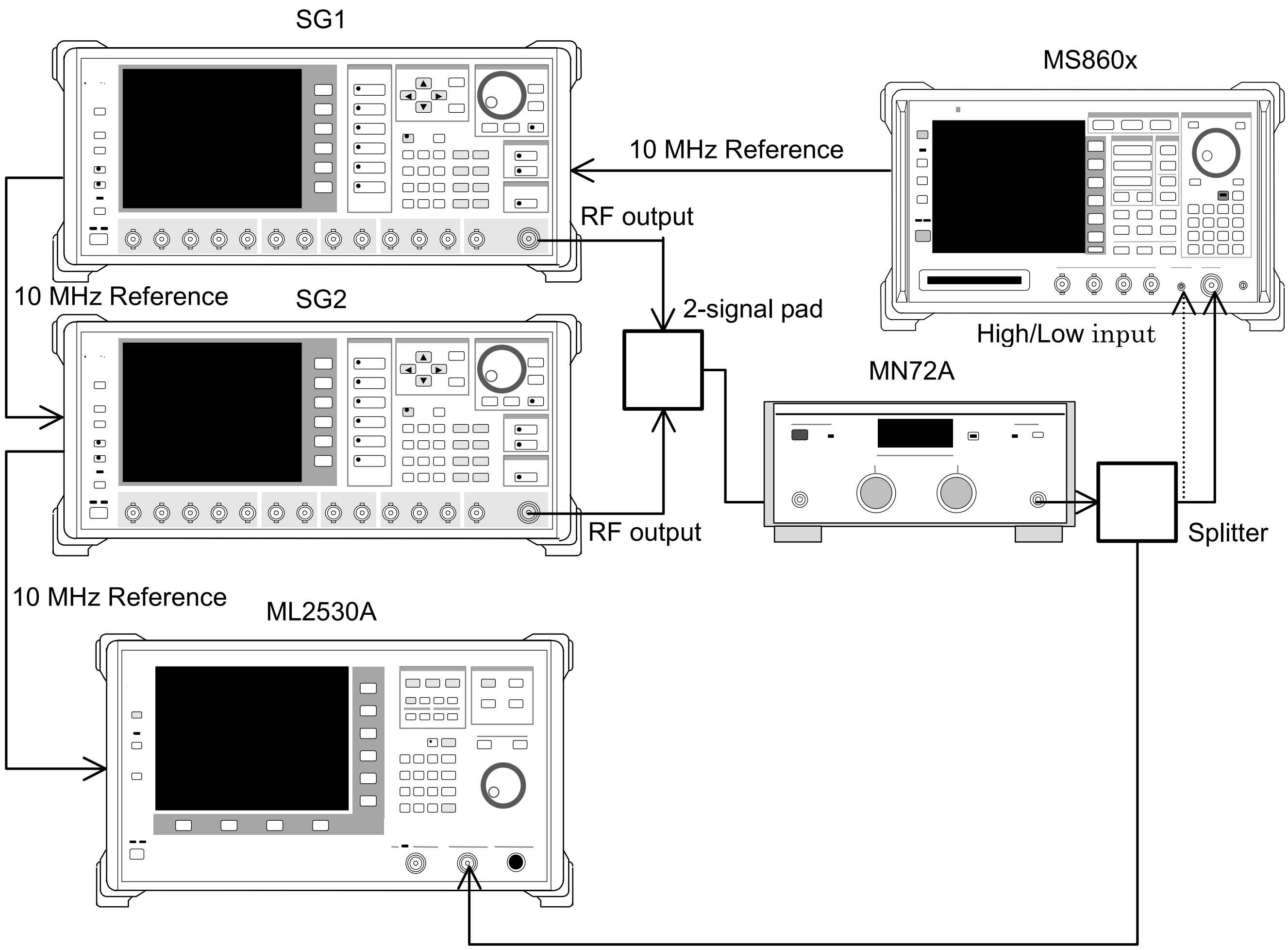
(1) Specifications targeted for testing

- Carrier frequency accuracy ±(reference crystal oscillator accuracy +10 Hz) only on code channel 1 CH
  at the following input level:
  ≥−10 dBm (at MS8608A High Power Input)
  ≥−30 dBm (at MS8608A Low Power Input and MS8609A)
  ≥−40 dBm (when Pre-amplifier is On (at Low Power Input for MS8608A))
- Residual vector error: < 2.0 % (rms) only on code channel 1 CH
  at the following input level:
  ≥−10 dBm (at MS8608A High Power Input)
  ≥−30 dBm (at MS8608A Low Power Input and MS8609A)
  ≥−40 dBm (when Pre-amplifier is On (at Low Power Input for MS8608A))
- Origin offset accuracy: ±0.5 dB, for signal of −30 dBc origin offset, only on code channel 1 CH
  at the following input level:
  ≥−10 dBm (at MS8608A High Power Input)
  ≥−30 dBm (at MS8608A Low Power Input and MS8609A)
  ≥−40 dBm (when Pre-amplifier is On (at Low Power Input for MS8608A))

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Digital modulation signal generator (SG2): MG3681A
- Calibration receiver: ML2530A
- Programmable attenuator: MN72A
- 2-signal pad
- Power splitter

(3) Setup



(4) Test procedures

1. Set the programmable attenuator (MN72A) to 0 dB.
2. Set SG1 as follows.
   - Frequency: (Frequency shown in the table below +960 kHz)
     However, use −960 kHz instead of +960 kHz when the frequency is 3,000 MHz.
     960 kHz is a quarter of chip rate.
   - Level: −10 dBm
   - Modulation: Un-modulated
3. Set SG2 as follows. (Keep RF Output Off)
   - Frequency: (Frequency shown in the table below)
   - Level: (SG1 level −40 dBm)
   - Modulation: Un-modulated
4. Set the transmitter tester as follows
   - Input Terminal: RF (High Power Input)
   - Reference Level: −10 dBm
   - Frequency: (Frequency shown in the table below)
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Run
5. Press [ ] (More) to display the second page of the function label.
6. Press [F6] (Power Meter) to move to the Power Meter screen.
7. Switch SG1 output to Off and execute [F5] (Zero Set).
8. Switch SG1 output to On and execute [F4] (Adjust Range).
   Adjust the SG1 level so that the power meter indicates a value of −10 dBm±0.1 dB.
   (Be sure to execute Adjust Range after changing the SG1 level.)
   Press [F6] (Back Screen) after level calibration.
9. Set the programmable attenuator (MN72A) to 30 dB.
10. Set the calibration reciever (ML2530A) as follows.
    Frequency: (Frequency shown in the Step 19 +960 kHz)
    However, use −960 kHz instead of +960 kHz when the frequency is 3,000 MHz, BW: 100 Hz, Relative mode (Level range: fixed to 2).

11. Set SG2 RF Output to On.
    Then, after changing the frequency of ML2530A to the frequency shown in the Step 19, adjust the SG2 level so that a value of −30 dB±0.1 dB is indicated, and record the results (expected origin offset value).
    The ML2530A indicates the expected origin offset value.
12. Set the programmable attenuator (MN72A) as follows.
    When Pre-amplifier is set to On: 30 dB
    When MS8609A and MS8608A Low Power Input: 20 dB
    When MS8608A High Power Input: 0 dB
13. Move the function label back to the first page, and press [F2] (Modulation Analisis) on the MS860x to move to the Modulation Analysis screen.
14. Execute [F5] (Adjust Range).
15. Press [F4] (Analysis Mode), and then press [F2] (Analysis Length) to set Analysis Length to 2,560 chips. Press [F6] (return).
16. See that the origin offset meets the specifications by the measured-result display on the screen.
    Origin offset accuracy [dB] = Measured result − Expected origin offset value
17. Switch SG2 output level to Off.
18. See that the frequency error and residual vector error meet specifications by the measured results display on the screen.
19. Repeat steps 1 through 18 above, using the different frequency shown in the table below.

Frequency	Level (Input level to MS860x)		
	MS860x with Pre-amplifer On	MS8608A Low Power Input and MS8609	MS8608A High Power Input
50 MHz	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−10 dBm±0.1 dB
2000 MHz	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−10 dBm±0.1 dB
3000 MHz*1	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−10 dBm±0.1 dB

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Code Domain Measurement <MS860x>

This section tests the following specification.

- Code domain power measurement accuracy

Note:

This measurement is partly different from our shipping inspection for convenience.

(1) Specifications targeted for testing

Code domain power measurement accuracy:

±0.1 dB (code power ≥−10 dBc)
±0.3 dB (code power ≥−25 dBc)

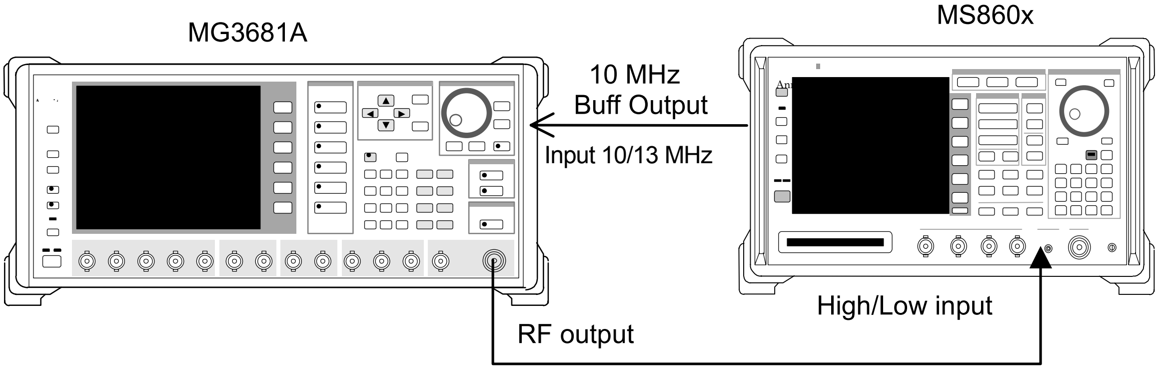
at the following input level:

≥+10 dBm (at MS8608A High Power Input)
≥−10 dBm (at MS8608A Low Power Input and MS8609A)
≥−40 dBm
(when Pre-amplifier is On (at Low Power Input for MS8608A))

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set "evaluation signal" data on the digital modulation signal generator (SG1).
   See "Evaluation Signal" section for more information on the evaluation signal.
2. Set SG1 as follows.
   - Frequency: 50 MHz
   - Level: −10 dBm
3. Set the transmitter tester as follows
   - Input Terminal: RF (Low Power Input)
   - Reference Level: −10 dBm
   - Frequency: 50 MHz
   - Measuring Object: Down Link
   - Filter: Filtering
   - Scrambling Code Sync. & Number: Set = 0000
   - Spreading Factor: 512
   - Channelization Code: 0
   - Trigger: Free Run
4. Press [ ] (More) to display the second page of the function label.
5. Press [F6] (Power Meter) to move to the Power Meter screen.
6. Switch SG1 output to Off and execute [F5] (Zero Set).
7. Switch SG1 output to On and execute [F4] (Adjust Range).
   Adjust SG1 level so that Power Meter indication is −10 dBm±0.1 dB (Press [F4] (Adjust Range) each time after changing SG1 level.) Press [F6] (Back Screen) after level calibration.
8. Move the function label back to the first page, and press [F2] (Modulation Analysis) on the transmitter tester to move to the Modulation Analysis screen.
9. Execute [F5] (Adjust Range).
10. Press [F4] (Analysis Mode), and then press [F1] (Analysis Start) to set Analysis Start to 0, and press [F2] (Analysis Length) to set Analysis Length to 2,560 chips.
11. Press [F6] (return), and then press [F1] (Trace Format) to set Code Domain.
12. Press [ ] (More) twice to display the third page of the function label.
13. Press [F5] (Max SF) and set Max Spreading Factor to 512.
14. Press [F4] (Spreading Factor) to set Spreading Factor to 512, which specifies the number of screen-display codes.

15. Move the function label to the fourth page, and set [F1] (Exclude EVM Origin Ofst.) to On.
16. Press [Single], and wait for the measurement end.
17. See that the power values of the codes shown below meet specifications.
    The expected power values for individual codes are as follows.

Code 0	:	−2.44 dB
Code 63	:	−5.0 dB
Code 127	:	−10.0 dB
Code 255	:	−20.0 dB
Code 511	:	−25.0 dB

18. Change the frequency of SG1 and transmitter tester to 2 GHz and then 3 GHz*1 and repeat step 1 through 15 above.

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Transmitter Power Measurement Accuracy <MS860x>

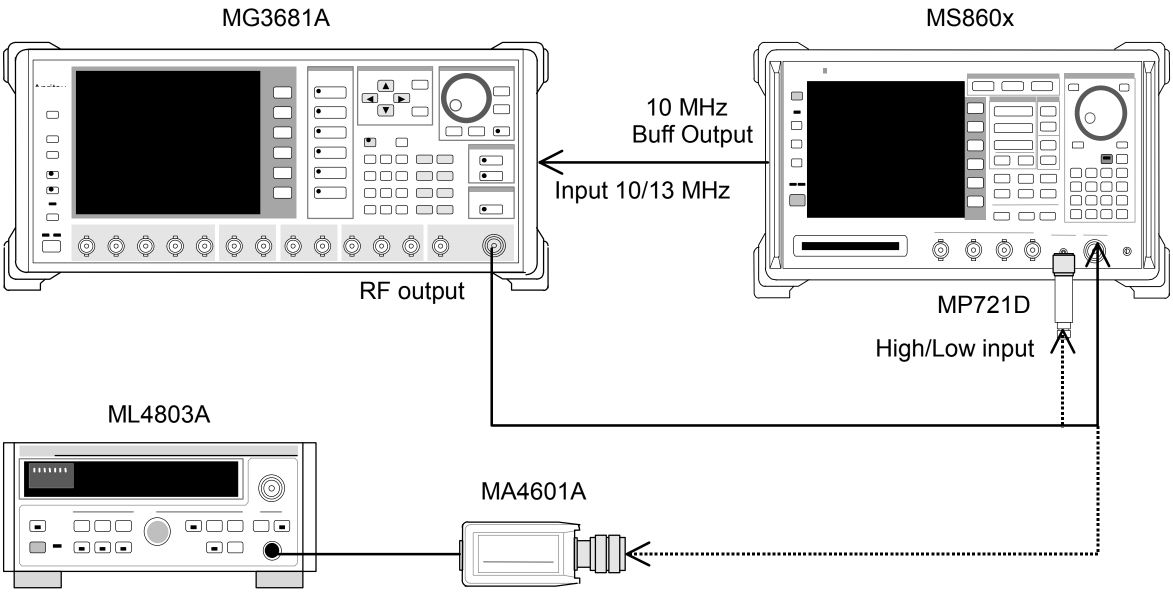
(1) Specifications targeted for testing

±0.4 dB (after calibration using the built-in power meter)

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Power meter: ML4803A
- Power sensor: MA4601A
- 20 dB attenuator: MP721D

(3) Setup



(4) Test procedures

1. Set "evaluation signal" data on the digital modulation signal generator (SG1).
   See "Evaluation Signal" section for more information on the evaluation signal.
2. Set SG1 as follows.
   - Frequency: 50 MHz
   - Level: +0.5 dBm
3. Connect the power sensor (MA4601A) to the Cal Output of the power meter (ML4803A), and execute Zero Adjust.
4. Switch the Sensor Input to On, and execute ADJ (Cal Adjust) of the power meter (ML4803A).
5. Connect SG1 to the power sensor (MA4601A).
6. Adjust the SG1 output level so that the power meter (ML4803A) indicates a value of +0.5 dBm±0.1 dB, and record measured result (actually measured Transmitter Power value by the power meter).
7. Connect the SG1 output to the transmitter tester.
8. Set the transmitter tester as follows
   - Input Terminal: RF (High Power Input)
   - Reference Level: +0.5 dBm
   - Frequency: 50 MHz
   - Measuring Object: QPSK
9. Move the function label back to the first page, and press [F3] (Transmitter power) to move to the Transmitter Power screen.
10. Execute [F5] (Adjust Range).
11. Press [F4] (Calibration), and execute [F1] (Power Calibration).
12. Read Tx Power value of the measured result (actually measured Transmitter Power value).
13. While changing the frequency of SG1 and the transmitter tester to 2 GHz and then 3 GHz*1, repeat steps 2 through 12 above.
    When the measurement for each frequency is completed, process to step14.

    *1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

14. Press [Shift] and then press [Hi Power] to switch the input to Low Power Input.
    In this case, insert the calibrated MP721D 20 dB attenuator at Low Power Input. (Be sure to measure the attenuation amount of the MP721D at each test frequency, beforehand.)
15. Connect the SG1 output to Low Power Input, and repeat steps 2 through 13.
    These measured results are the Transmitter Power values of Low Power Input.
    - For MS8608A High Power Input:
      Measurement accuracy [dB] =
      Actual power measured by Transmitter Power -
      Actual power measured by power meter
    - For MS8608A Low Power Input, MS8609A, and Pre-amplifier On:
      Measurement accuracy [dB] =
      Actual power measured by Transmitter Power −
      (Actual power measured by power meter −
      Actual attenuation of MP721D)

Linearity <MS860x>

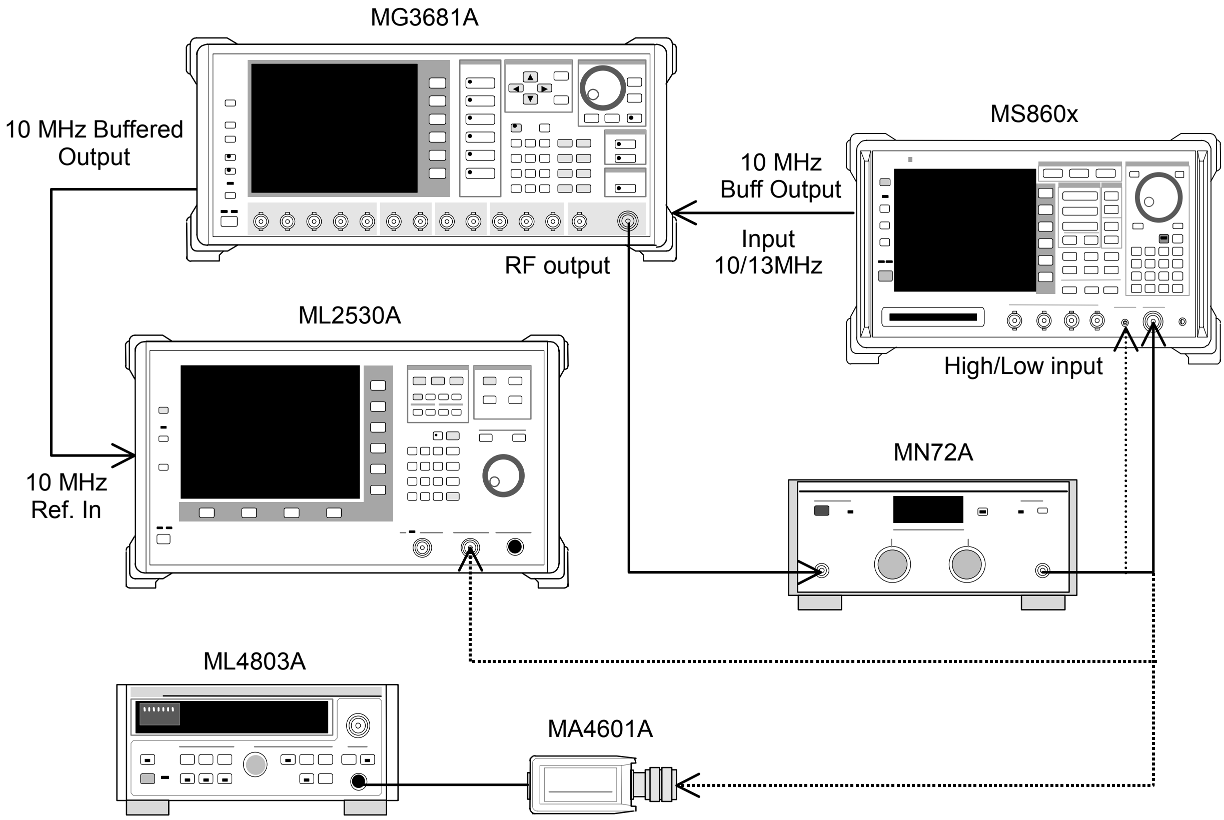
(1) Specifications targeted for testing

±0.2 dB (0 to − 40 dB)
In the condition where the reference level setting remains unchanged after range optimization

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Calibration receiver: ML2530A
- Programmable attenuator: MN72A
- Power meter : ML4803A
- Power sensor : MA4601A

(3) **Setup**



(4) **Test procedures**

1. Connect the power sensor (MA4601A) to the Cal Output of the power meter (ML4803A), and execute Zero Adjust.
2. Switch the Sensor Input to On, and execute ADJ (Cal Adjust) of the power meter (ML4803A).
3. Connect SG1 to the power sensor (MA4601A) through the programmable attenuator (MN72A).
4. Set SG1 frequency (as shown in the table below), and the programmable attenuator (MN72A) to 0 dB.
   Adjust the SG1 level so that the power meter (ML4803A) indicates a value of +10 dBm±0.1 dB, and record the set value (Set_Ref).

The combinations of the set frequency and level are shown in the table below.

Frequency	Level (Input level to MS 860x)		
	MS860x with Pre-amplifer On	MS8608A Low Power Input and MS8609A	MS8608A High Power Input
50 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	+10 dBm±0.1 dB
2000 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	+10 dBm±0.1 dB
3000 MHz*1	−20 dBm±0.1 dB	−10 dBm±0.1 dB	+10 dBm±0.1 dB

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

5. Connect SG1 to the calibration receive (ML2530A) through the programmable attenuator (MN72A), and set BW to 100 Hz and mode to Relative for ML2530A. (Fix the level range at 1.)
6. Lower the SG1 output level by 10 dB step to −40 dBc (compared to Set_Ref), and record the measured value by the calibration receiver (ML2530A) every time the level is lowered (indication value by ML2530A).
7. Set the transmitter tester as follows
   - Input Terminal: RF (High/Low Power Input)
   - Reference Level: (Level shown in the Step 4)
   - Frequency: (Frequency shown in the Step 4)
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Run
8. Set the programmable attenuator (MN72A), as below.
   - Pre-amplifier is On: 30 dB
   - MS8608A Low Power Input and MS8609A: 20 dB
   - MS8608A High Power Input: 0 dB
9. Connect SG1 to the transmitter tester through the programmable attenuator (MN72A), and set SG1 level to Set_Ref.
10. Press F3 (Transmitter Power) to move to the Transmitter Power screen.
11. Execute F5 (Adjust Range).
12. Press F4 (Calibration), and execute F1 (Power Calibration).
13. Record the Tx Power value (dBm) (Measure_Ref).

14. Lower the SG1 output level by 10 dB step to −40 dBc (compared to Set_Ref), and record the Tx Power values every time the level is lowered.

    Note:

    Change the SG1 level by 10 dB step. Be sure not to change the programmable attenuator (MN72A) setting amount.

15. Check that the linearity error (shown below) meets the specifications.
    Linearity error [dB] =
    Tx Power value − (Measure_Ref − Indication value by ML2530A)

16. Repeat steps 3 through 15 above, using different frequency shown in the table above.

Occupied Bandwidth Measurement <MS860x>

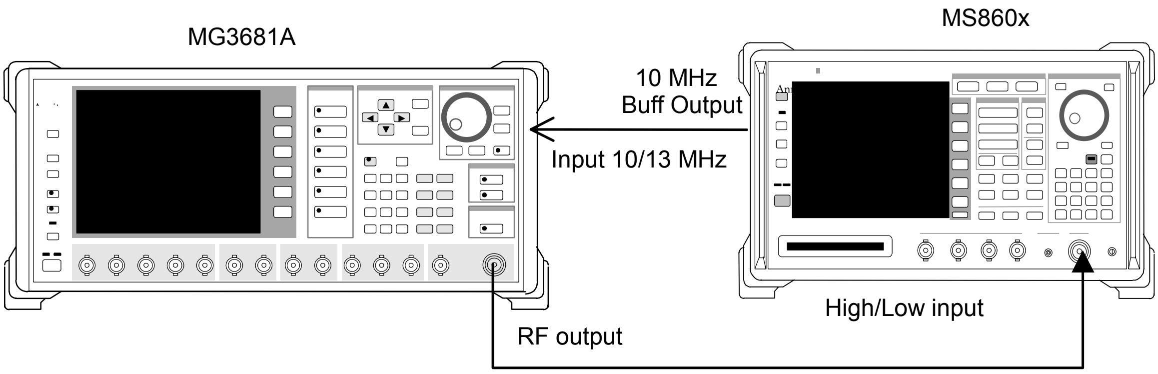
As this test is a functional test, no specifications targeted for testing are available.

(1) Specifications targeted for testing

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set "evaluation signal" data on the digital modulation signal generator (SG1).
   See "Evaluation Signal" section for more information on the evaluation signal.
2. Set SG1 as follows.
   - Frequency: (Frequency shown in the Step 8)
   - Level: (Level shown in the Step 8)
3. Set the transmitter tester as follows
   - Input Terminal: RF (High/Low Power Input)
   - Reference Level: 0 dBm (Level shown in the Step 8)
   - Frequency: 50 MHz (Frequency shown in the Step 8)
   - Measuring Object: QPSK
4. Press [F4] (Occupied Bandwidth) to move to the Occupied Bandwidth screen.
5. Execute [F4] (Adjust Range).
6. Press [F1] (Measure Method) to switch the measurement method to FFT.
7. Check that the measured results of the occupied bandwidth is 4.2 ±0.5 MHz.
8. Repeat steps 2 through 7 above, using different frequency shown in the table below.

Frequency	Level (Set level of SG1)		
	MS860x with Pre-amplifer On	MS8608A Low Power Input and MS8609	MS8608A High Power Input
50 MHz	−30 dBm	−20 dBm	0 dBm
2000 MHz	−30 dBm	−20 dBm	0 dBm
3000 MHz*1	−30 dBm	−20 dBm	0 dBm

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Adjacent Channel Leakage Power Measurement <MS860x>

(1) Specifications targeted for testing

Code channel 1 CH:

5 MHz detuning: ≥55 dBc

10 MHz detuning: ≥62 dBc

Code channel 16 CH multiplexed (only when Option 08 Pre-amplifier is not installed):

5 MHz detuning : ≥50 dBc

10 MHz detuning: ≥60 dBc

at following input level in wide dynamic range mode, and using filtering method:

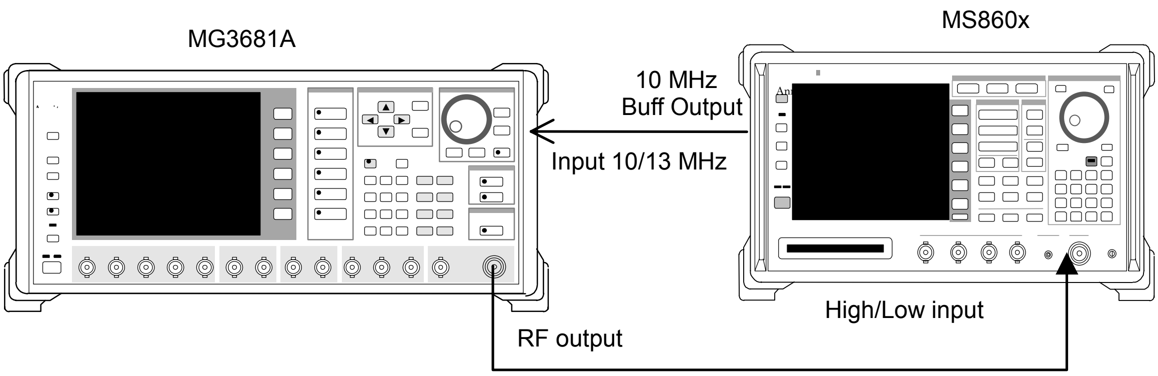
≥+20 dBm (at MS8608A High Power Input)

≥0 dBm (at MS8608A Low Power Input and MS8609A)

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set the digital modulation signal generator (SG1), as follows.
   - Frequency: (Frequency shown in the table below)
   - Level: (Level shown in the table below)
   - System: W-CDMA
   - Filter: RNYQ
   - Filter Mode: ACP
   - Maximum Code Number: 1
   - Chip Rate: 3.84 Mcps
   - Roll Off Ratio: 0.22

2. Set the transmitter tester as follows
   - Input Terminal: RF (Low Power Input)
   - Reference Level: 0 dBm (Level shown in the Step 12)
   - Frequency: (Frequency shown in the Step 12)
   - Measuring Object: QPSK
   - Trigger: Free Rum
3. Press [ ] (More) to display the second page of the function label.
4. Press [F6] (Power Meter) to move to the Power Meter screen.
5. Switch SG1 output to off, and execute [F5] (Zero Set).
6. Set SG1 to the level shown in the table below, and [F4] (Adjust Range). Adjust the SG1 level so that the power meter indicates the value shown in the Step 12.
   (Be sure to execute Adjust Range after changing the SG1 level.)
7. Press [F6] (Back Screen) after level calibration.
8. Move the function label back to the first page, and press [F5] (Adjacent Channel Power) to move to the Adjacent Channel Power screen.
9. Execute [F4] (Adjust Range).
10. Press [F1] (Measure Method), and set the measurement method to Modulation and the Wide Dynamic Range to On.
11. Check that the measured value meets the specifications by the measured results.
12. Repeat steps 1 through 11 above, while changing the frequency as shown in the table below.
    (Change the SG1 Maximum Code Number to 16 at measurement of Code 16 CH, shown in the table below.)

Frequency	Level (Input level to MS860x)		
	MS8608A Low Power Input and MS8609A		MS860x Pre-amplifier Installed*2
	Code 1 CH	Code 16 CH	Code 1 CH
200 MHz	0 dBm±0.1 dB	−3 dBm±0.1 dB	0 dBm±0.1 dB
2000 MHz	0 dBm±0.1 dB	−3 dBm±0.1 dB	0 dBm±0.1 dB
3000 MHz*1	0 dBm±0.1 dB	−3 dBm±0.1 dB	0 dBm±0.1 dB

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

*2: Make the measuremedt with MS860x Option 08 on Pre-Ampl set to Off.

Spurious Measurement <MS860x>

(1) Specifications targeted for testing

- Measurement range

Carrier frequency: 1,800 to 2,200 MHz

≥80 dB (RBW: 1 kHz)
(9 to 150 kHz, band 0)

≥80 dB (RBW: 10 kHz)
(150 kHz to 30 MHz, band 0)

≥80 dB (RBW: 100 kHz)
(30 MHz to 1 GHz, band 0)

≥76 − f [GHz] dB (RBW: 1 MHz)
(1 to 3.15 GHz, band 0, in Normal mode)

≥77 dB (RBW: 1 MHz)
(3.15 to 7.8 GHz band 1, in Normal mode)

When Option 03 Pre-selector is installed

≥77 dB (RBW: 1 MHz)
(1.6 to 7.8 GHz band 1, in spurious mode)

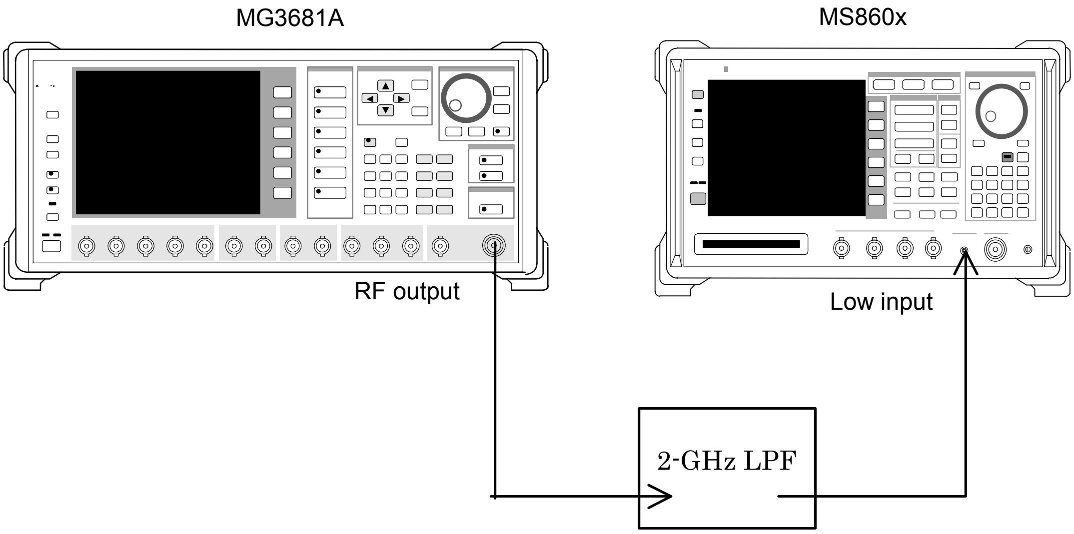
Note, however, that in the carrier frequency range of 2,030.354 to 2,200 MHz, a spurious is generated with the following relationship.

f(Spurious) = f(in) − 2,030.345 MHz

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- 2 GHz LPF

(3) Setup



(4) Test procedures

1. Set the frequency and output level the digital modulation signal generator (SG1), as shown in the table below.
   Measure the input level to the transmitter tester using the built-in power meter.
   Combination of the test frequency with the level is shown in the table below

Frequency	Level (indication value by built-in power meter)	
	MS860x with Pre-amplifier Off*1	MS8608A Low Power Input and MS8609A
2000 MHz	0 dBm±0.1 dB	0 dBm±0.1 dB

*1: Set Pre-Ampl to Off on Option 08 installed

2. Set the transmitter tester as follows
   - Input Terminal: RF (Only Low Power Input for MS8608A)
   - Reference Level: 0 dBm
   - Frequency: 2000 MHz
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Rum
3. Press [ ] (More) to display the second page of the function label.
4. Press [F6] (Power Meter) to move to the Power Meter screen.
5. Set SG1 output level to off, and execute [F5] (Zero Set).

6. Set SG1 output level to the level shown in the step1, and execute [F4] (Adjust Range).
   Adjust the SG1 level so that the power meter indicates the value of 0 dBm±0.1 dB.
   (Be sure always to execute Adjust Range after changing the SG1 level.)
7. Press [F6] (Back Screen) after level calibration.
8. Move the function label back to the first page, and press [F6] (Spurious Emission) to move to the Spurious Emission Screen.
9. Press [F1] (Spurious Mode), and select [F3] (Sweep).
   After completion of this setting, press [F6] (return).
10. Press [F3] (Setup Search/Sweep Table), and set table 1.0.
    After completion of this setting, press [F6] (Back Screen).
11. Press [ ] (More) to display the second page of the function label.
    Press [F4] (Preselector), and select Normal mode.
12. Move the function label back to the first page.

    Note:

    Steps 11 and 12 above can be set only when Option 03 Pre-selector is installed.
13. Execute [F5] (Adjust Range).
14. Press [F4] (Calibration), and execute [F1] (Power Caliblation)
15. Check that the measured results meet specifieations.
16. Make the following setting when Option 03 Pre-selector is installed.
17. Press [ ] (More) to display the second page of the function label, after pressing [F3] (Setup Search/Sweep Table).
18. Press [F2] to clear the frequency table.
19. Set Table 1.1.
    After completion of the setting, press [F6] (Back Screen).
20. Press [ ] (More) to display the second page of the funcion label.
    Press [F4] (Preselector), and select Spurious mode.
21. Move the function label back to the first page.
22. Repeat steps 13 through 15.

Table 1.0

	Start Frequency	Stop frequency	RBW
f1	9 kHz	50 kHz	1 kHz
f2	50 kHz	150 kHz	1 kHz
f3	150 kHz	10 MHz	10 kHz
f4	10 MHz	30 MHz	10 kHz
f5	30 MHz	950 MHz	100 kHz
f6	1050 MHz	1950 MHz	1 MHz
f7	2050 MHz	3200 MHz	1 MHz
f8	3200 MHz	7800 MHz	1 MHz

Table 1.1

	Start Frequency	Stop frequency	RBW
f1	1600 MHz	1950 kHz	1 MHz
f2	2050 MHz	3150 kHz	1 MHz

CCDF Measurement <MS860x>

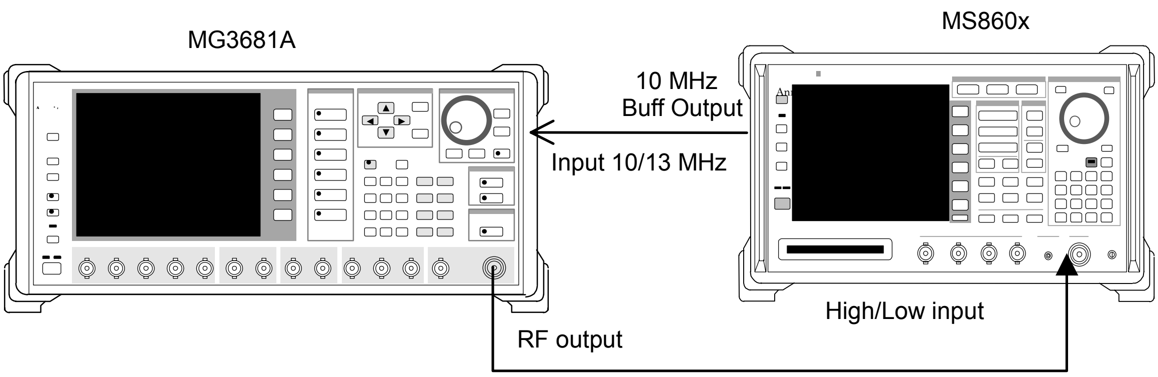
(1) Specifications targeted for testing

This is no specifications targeted for testing since this test is a function test.

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set the Digital Modulation Signal Generator (SG1), as follows:
    - Frequency: (Frequency shown in the Step 8)
    - Level: (Level shown in the Step 8)
    - System: W-CDMA
    - Filter: RNYQ
    - Filter Mode: EVM
    - Maximum Code Number: 1
    - Chip Rate: 3.84 Mcps
    - Roll Off Ratio: 0.22
2. Set the transmitter tester as follows
    - Input Terminal: RF (High/Low Power Input)
    - Reference Level: 0 dBm (Level shown in the Step 8)
    - Frequency: 50 MHz (Frequency shown in the Step 8)
    - Measuring Object: QPSK

3. Press [ ] (More) to display the second page of the function labal.
4. Press [F3] (CCDF) to go to the CCDF screen.
5. Execute [F4] (Adjust Range).
6. Press [F1] (Measure Method) to switch the Measure Method to "CCDF".
7. Confirm that the measured value at "0.0001%" reads "5.6 dB±1 dB."
8. Change the frequency and repeat the steps from 2 to 7.

Frequency	Level (Input level to SG1)		
	MS860x with Pre-amplifier On	MS8608A Low Power Input and MS8609A	MS8608A High Power Input
50 MHz	−30 dBm	−20 dBm	0 dBm
2000 MHz	−30 dBm	−20 dBm	0 dBm
3000 MHz*	−30 dBm	−20 dBm	0 dBm

*The maximum frequency when Option 08 Preamble is installed is 2300MHz.

IQ Input Modulation Accuracy <MS860x>

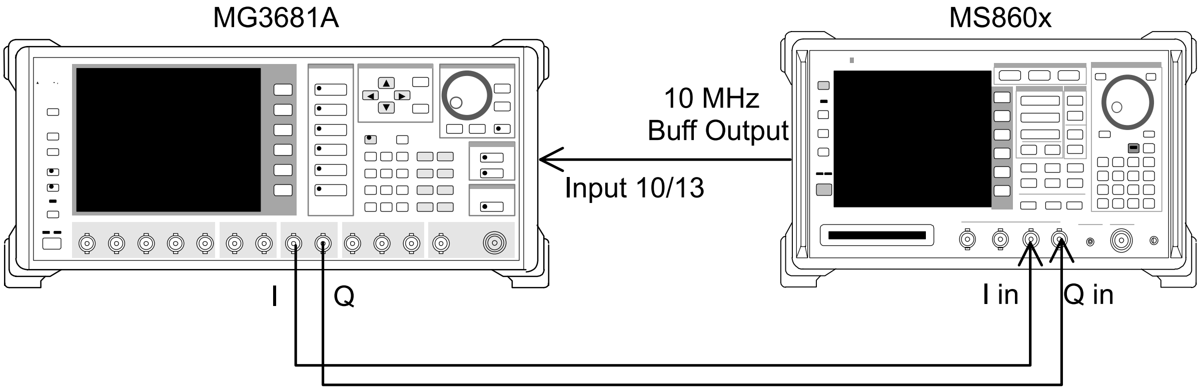
(1) Specifications targeted for testing

Residual vector error: < 2% (rms), DC coupling.

(2) Measuring instruments used in testing

- Digital Modulation Signal Generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set the signal data of the Digital Modulation Signal Generator (MG3681A) to "evaluation signal". See "Evaluation signal" section for more information.
2. Set the transmitter tester as follows
   - Input Terminal: IQ-DC
   - Impedance: 50 Ω
   - Measuring Object: Down Link
   - Filter: Filtering
   - Scrambling Code Sync & Number: Set = 0000
   - Spreading Factor: 512
   - Channelization Code: 0
   - Trigger: Free Run
3. Press F2 (Modulation Analysis) to Modulation Analysis screen.
4. Press F4 (Analysis Mode), then press F1 (Analysis Start), and set Analysis Start to 0. Press F2 (Analysis Length), and set Analysis Length to 2,560 chips. Press F6 (return).
5. Move the function label to the fourth page, and set F1 (Exclude EVM Origin Ofst.) to On.
6. Confirm that the residual vector meets specifications.

Evaluation Signal <MS860x>

The “evaluation signal” described in this section is set as follows.
This section explains the evaluation signal required to implement a performance test. Set the evaluation signal on the Digital Modulation Signal Generator that you use.

General information on evaluation signal

- Spreading factor: 512
- Channelization Code: 0, 63, 127, 255, and 511 (5 code multiplexing)
- Signal under the System Format for Scrambling Code = 0x00000
- Power ratios are as follows.

Power ratio for each code

Power ratio

Code 0	:	−2.44 dB
Code 63	:	−5.0 dB
Code 127	:	−10.0 dB
Code 255	:	−20.0 dB
Code 511	:	−25.0 dB

Power Meter Accuracy <MS860x>

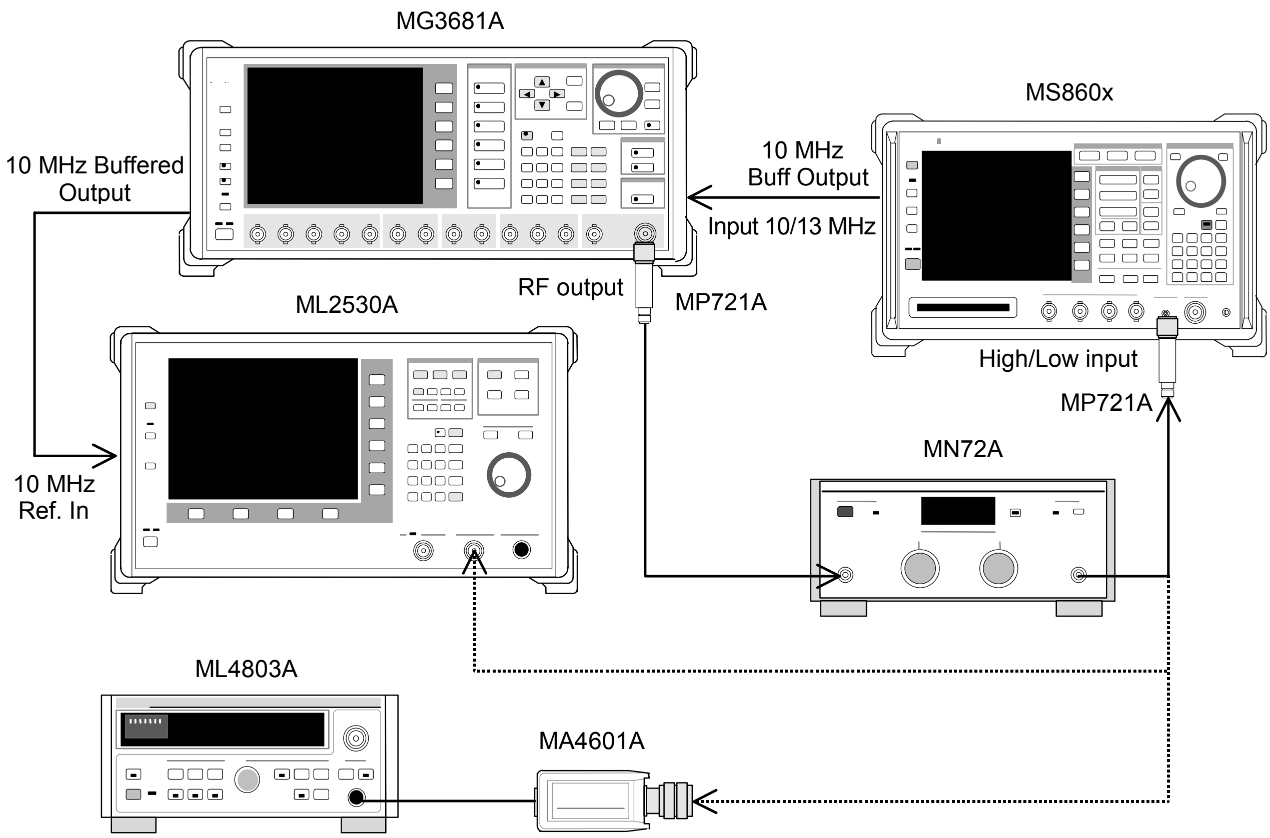
(1) Specifications targeted for testing

Measurement level accuracy ±10% (after zero-point calibration)

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Calibration receiver: ML2530A
- Power meter: ML4803A
- Power :sensor: MA4601A
- Programmable attenuator: MN72A
- 3 dB Attenuator ×2: MP721A

(3) Setup



(4) Test procedures

1. Connect the power sensor (MA4601A) to the Cal Output of the power meter (ML4803A), and execute Zero Adjust.
2. Set Sensor Input to On, and execute ADJ (Cal Adjust) of the power meter (ML4803A).
3. Connect SG1 to the power sensor (MA4601A) through MN72A and MP721A.
4. Set SG1 frequency, as below.
   Test frequency: 50 MHz, 2,000 MHz and 3,000 MHz
5. Adjust the SG1 level so that the power meter (ML4803A) indicates a value of +10 dBm±0.1 dB at the set frequency, and record the set value of SG1(Set_Ref) and the measured result (Read_Ref) indicated by the power meter.
6. Connect SG1 to the calibration receiver (ML2530A) through MN72A and MP721A, and set the SG1 level to the value (Set_Ref) previously recorded in step 5.
7. Set the calibration reciever (ML2530A) to Relative mode (range 1 fixed).
   Lower the programmable attenuator (MN72A) in 10 dB step to −30 dBc, and record the measured values by ML2530A every time the level is attenuated (ATT_n)
   After recording is completed, return the MN72A setting to 0 dB.
8. Press [ ] (More) of the transmitter tester to display the second page of the function label.
9. Press [F6] (Power Meter) to move to the Power Meter.
10. Execute [F5] (Zero Set) while inputting no signals to the transmitter tester.
11. Connect SG1 to the transmitter tester through MN72 and MP721A.
12. Set the frequency of the transmitter tester to the frequency set in step 4.

13. Lower the programmable attenuator (MN72A) in −10 dB step by to −30 dBc.
Obtain the measurement accuracy (as shown below) by the value measured by the transmitter tester every time the level is attenuated (value measured by tester) and the value obtained by subtracting the value (ATT_n) measured by ML2530A from the value (Read_Ref) indicated by the power meter.
Be sure to execute F4 (Adjust Range) every time the programmable attenuator amount is lowered.

$$\text{Measurement accuracy}[\%] = \left(\frac{10^{([\text{Value measured by tester}]/10)}}{10^{(Read\_Ref + ATT\_n)/10}} - 1 \right) \times 100$$

Note:

ATT_n is a negative value.

14. Repeat steps 3 through 13 above, while changing frequency shown in step 4.

Performance Test <MS268x>

Unless otherwise specified, be sure to warm up the device under test (DUT, MS268x with MX268x01A/B) to be tested and the measuring instruments for at least 30 minutes or over until they become stable, and then execute the internal calibration in the spectrum analyzer mode, before implementing the performance test.
To ensure the maximum measurement accuracy, we recommend that you observe the above as well as keeping the room temperature at 25±5℃, limiting AC voltage fluctuations to a minimum, and making sure that there are no problems with noise, vibration, dust, humidity or other environmental factors.

Modulation/Frequency Measurement <MS268x>

This section tests the following specifications.

- Carrier frequency accuracy
- Residual vector error
- Origin offset accuracy

(1) Specifications targeted for testing

<MS2681A/MS2683A>

- Carrier frequency accuracy ±(reference crystal oscillator accuracy +10 Hz) on code channel 1 CH at an input level: ≥−30 dBm (pre-ampl off)
- Residual vector error: < 2.0 % (rms) on code channel 1 CH at an input level: ≥−30 dBm (pre-ampl off).
- Origin offset accuracy: ±0.5 dB, for signal of −30 dBc origin offset, on code channel 1 CH at an input level: ≥−30 dBm (pre-ampl off)

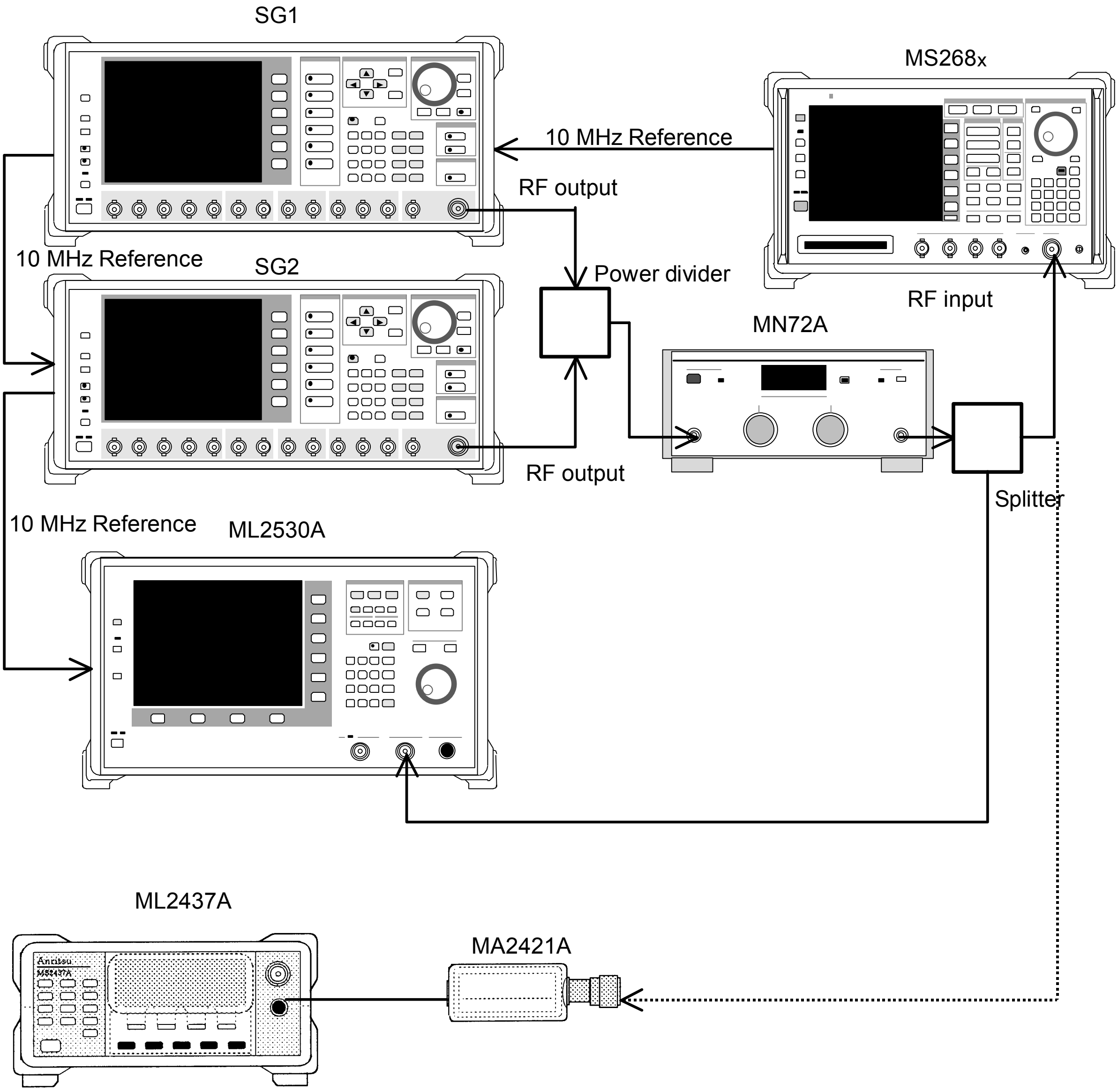
<MS2687A/B>

- Carrier frequency accuracy ±(reference crystal oscillator accuracy +10 Hz) on code channel 1 CH at an input level: ≥−30 dBm
- Residual vector error: < 2.0 % (rms) on code channel 1 CH at an input level: ≥−30 dBm
- Origin offset accuracy: ±0.5 dB, for signal of −30 dBc origin offset, on code channel 1 CH at an input level: ≥−30 dBm

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Digital modulation signal generator (SG2): MG3681A
- Calibration receiver: ML2530A
- Programmable attenuator: MN72A
- Power divider
- Power splitter
- Power meter: ML2437A
- Power sensor: MA2421A

(3) Setup



(4) Test procedures

1. Set the programmable attenuator (MN72A) to 0 dB.
2. Set SG1 as follows.
   - Frequency: (Frequency shown in the table below +960 kHz)
     However, use −960 kHz instead of +960 kHz when the frequency is 3,000 MHz.
     960 kHz is a quarter of chip rate.
   - Level: −10 dBm
   - Modulation: Un-modulated
3. Set SG2 as follows. (Keep RF Output Off)
   - Frequency: (Frequency shown in the Step 18)
   - Level: (SG1 level − 40 dBm)
   - Modulation: Un-modulated
4. Set the Spectrum Analyzer as follows:
   - Input Terminal: RF
   - Reference Level: −10 dBm
   - Frequency: (Frequency shown in the Step 18)
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Run
5. Connect the splitter output to the power sensor (MA2421A) and switch SG1 output to On.
6. Adjust the SG1 level so that the power meter (ML2437A) indicates a value of −10 dBm±0.1 dB.
7. Connect the splitter output to RF input of Spectrum Analyzer.
8. Set the programmable attenuator (MN72A) to 30 dB.
9. Set the calibration reciever (ML2530A) as follows:
   Frequency: (Frequency shown in the Step 18 +960 kHz)
   However, use −960 kHz instead of +960 kHz when the frequency is 3,000 MHz.
   BW: 100 Hz
   Relative mode
   (Level range: fixed to 2)
10. Set SG2 RF Output to On.
    Then, after changing the frequency of ML2530A to the frequency shown in the Step 18, adjust the SG2 level so that a value of −30 ±0.1 dB is indicated, and record the results (exprected origin offset value).

11. Set the programmable attenuator (MN72A) as follows:
    When Pre-amplifier is On : 30 dB
    When Pre-amplifier is Off : 20 dB
12. Move the function label back to the first page, and press [F2] (Modulation Analysis) on Spectrum Analyzer to display the Modulation Analysis screen.
13. Execute [F5] (Adjust Range).
14. Press [F4] (Analysis Mode), and then press [F2] (Analysis Length) to set Analysis Length to 2,560 chips. Press [F6] (return).
15. See that the origin offset meets the specifications by the measured-result display on the screen.

    Origin offset accuracy [dB] =
    Measured result − Expected origin offset value
16. Switch SG2 output level to Off.
17. See that the frequency error and residual vector error meet specifications by the measured result display on the screen.
18. Repeat steps 1 through 17 above, using the different frequency shown in the table below.

Frequency	Level (Input level to MS268x)		
	MS2681A/MS2683A Pre-amplifer On	MS2681A/MS2683A Pre-amplifer Off	MS2687A/B
50 MHz	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−30 dBm±0.1 dB
2000 MHz	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−30 dBm±0.1 dB
3000 MHz*1	−40 dBm±0.1 dB	−30 dBm±0.1 dB	−30 dBm±0.1 dB

Note:

The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Code Domain Measurement <MS268x>

This section tests the following specification.

- Code domain power measurement accuracy

Note:

This measurement is partly different from our shipping inspection for convenience.

(1) Specifications targeted for testing

<MS2681A/MS2683A>

Code domain power measurement accuracy:

±0.1 dB (code power ≥−10 dBc)
±0.3 dB (code power ≥−25 dBc)

at the following input level: ≥−10 dBm (Pre-amplifier off)

<MS2687A/B>

Code domain power measurement accuracy:

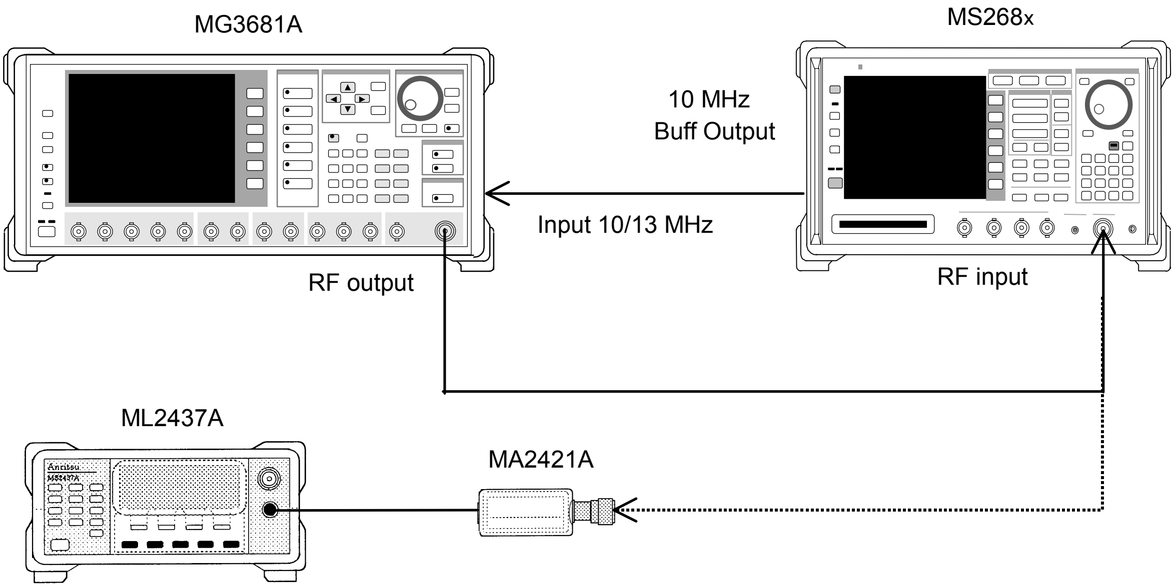
±0.1 dB (code power ≥−10 dBc)
±0.3 dB (code power ≥−25 dBc)

at the following input level: −10 dBm

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Power meter: ML2437A
- Power sensor: MA2421A

(3) Setup



(4) Test procedures

1. Set "evaluation signal" data on the digital modulation signal generator (SG1). Refer to "Evaluation Signal" for more information.
2. Set SG1 as follows.
   - Frequency: 50 MHz
   - Level: −10 dBm
3. Set the Spectrum Analyzer as follows:
   - Input Terminal: RF
   - Reference Level: −10 dBm
   - Frequency: 50 MHz
   - Measuring Object: Down Link
   - Filter: Filtering
   - Scrambling Code Sync. & Number: Set = 0000
   - Spreading Factor: 512
   - Channelization Code: 0
   - Trigger: Free Run
4. Connect SG1 output to the power sensor (MA2421A) and switch SG1 output to ON.
5. Adjust the SG1 level so that the power meter (ML2437A) indicates a value of −10 dBm±0.1 dB.

6. Connect SG1 output to RF input of the Spectrum Analyzer.
7. Execute [F5] (Adjust Range).
8. Press [F4] (Analysis Mode), and then press [F1] (Analysis Start) to set Analysis Start to 0, and press [F2] (Analysis Length) to set Analysis Length to 2,560 chips.
9. Press [F6] (return), and then press [F1] (Trace Format) to set Code Domain.
10. Press [ ] (More) twice to display the third page of the function label.
11. Press [F4] (Spreading Factor) to set Spreading Factor to 512, which specifies the number of screen-display codes.
12. Move the function label to the fourth page, and set [F1] (Exclude EVM Origin Ofst.) to On.
13. Press [Single], and wait for the measurement end.
14. See that the power values of the codes shows below meet specifications.

    The expected power values for individual codes are as follows.

    Code 0 : −2.44 dB

    Code 63 : −5.0 dB

    Code 127: −10.0 dB

    Code 255: −20.0 dB

    Code 511: −25.0 dB
15. Change the frequency of SG1 and Sprectrum Analyzer to 2 GHz and then 3 GHz* and repeat step 1 thorugh 13 above.

* The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Power Measurement Linearity <MS268x>

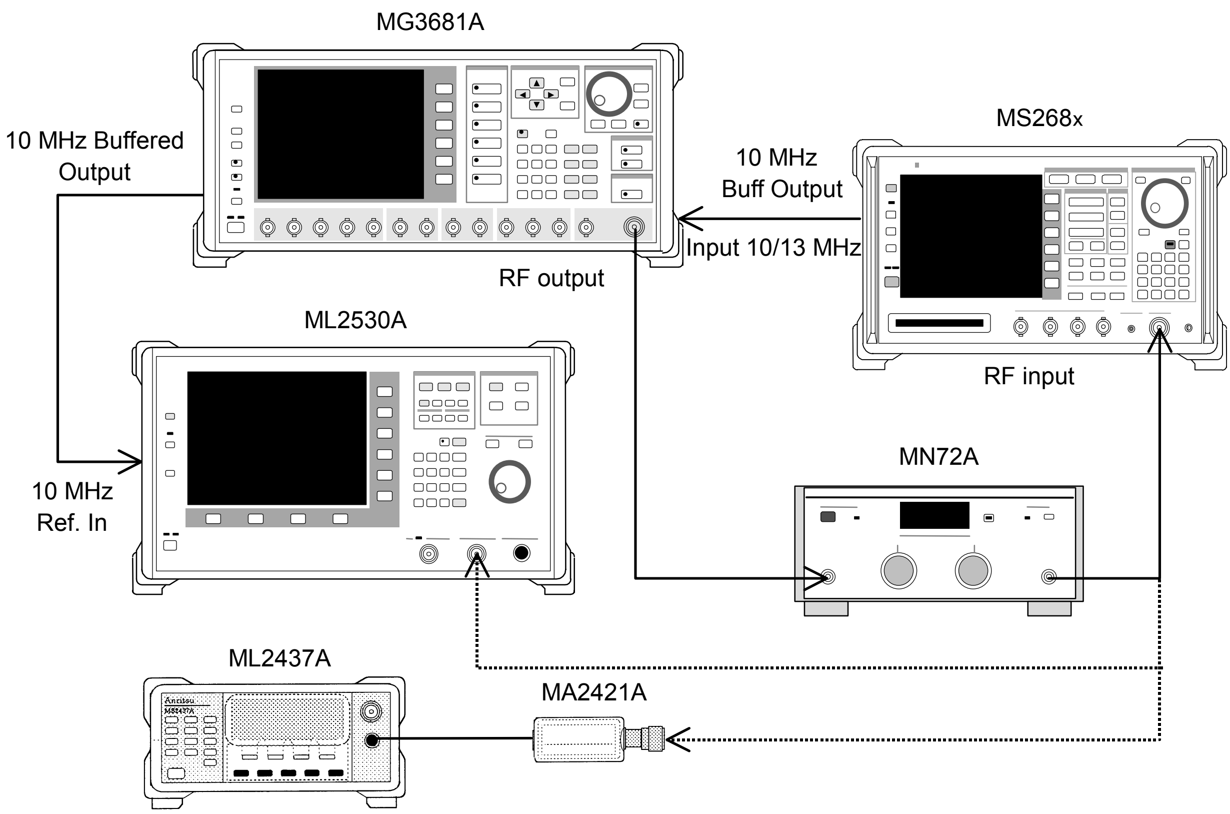
(1) Specifications targeted for testing

<MS2681A/MS2683A>
±0.2 dB (0 to − 40 dB) at an input level of ≥−10 dBm in the condition where the reference level setting remains unchanged after range optimization
<MS2687A/B>
±0.2 dB at the following input level: −10 dBm in the condition where the reference level setting remains unchanged after range optimization

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Calibration receiver: ML2530A
- Programmable attenuator: MN72A
- Power meter : ML2437A
- Power sensor : MA2421A

(3) Setup



(4) Test procedures

1. Connect the power sensor (MA2421A) to the Cal Output of the power meter (ML2437A), and execute Zero Cal.
2. Connect SG1 to the power sensor (MA2421A) through MN72A.
3. Set SG1 frequency (as shown in the table below), and the programmable attenuator (MN72A) to 0 dB.
   Adjust the SG1 level so that the power meter (ML2437A) indicates a value of +10 dBm±0.1 dB, and record the set value (Set_Ref).
   The combinations of the set frequency and level are shown in the table below.

Frequency	Level (Input level to MS268x)		
	MS2681A/MS2683A Pre-amplifer On	MS2681A/MS2683A Pre-amplifer Off	MS2687A/B
50 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB
2000 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB
3000 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB

Note:

The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

4. Connect SG1 to the calibration receive (ML2530A) through MN72A, and set BW to 100 Hz and mode to Relative for ML2530A. (Fix the level range at 1.)
5. Lower the SG1 output level by 10 dB step to −40 dBc (compared to Set_Ref), and record the measured value by the calibration receiver (ML2530A) every time the level is lowered (indication value by ML2530A).
6. Set the Spectrum Analyzer as follows:
   - Input Terminal: RF
   - Reference Level: (Level shown in the Step 3)
   - Frequency: (Frequency shown in the Step 3)
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Run
7. Set the programmable attenuator (MN72A), as follows:
   - Pre-amplifier is On: 30 dB
   - Pre-amplifier is Off: 20 dB
8. Connect SG1 to the Spectrum Analyzer through MN72A, and set SG1 level to Set_Ref.
9. Press F3 (Transmitter Power) to move to the Transmitter Power screen.

10. Execute $\boxed{F5}$ (Adjust Range).
11. Record the Tx Power value (dBm) (Measure_Ref).
12. Lower the SG1 output level by 10dB step to −40 dBc (compared to Set_Ref), and record the Tx Power values every time the level is lowered.

    Note:

    Change the SG1 level by 10 dB step. Be sure not to change the programmable attenuator (MN72A) setting amount.
13. Check that the linearity error (shown below) meets the specifications.
    Linearity error [dB] =
    Tx Power − (Measure_Ref − Indication value by ML2530A)
14. Repeat steps 2 thorugh 13 above, using different frequency shown in the table above.

Occupied Bandwidth Measurement <MS268x>

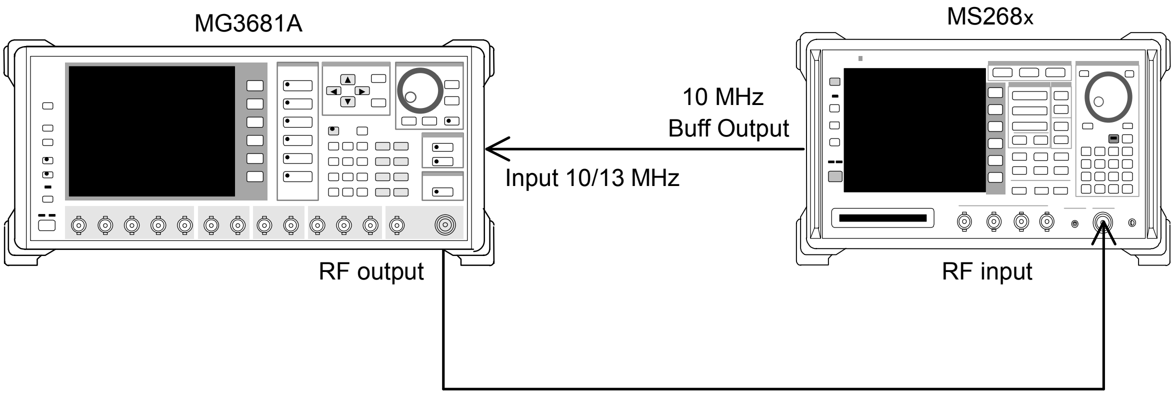
As this test is a functional test, no specifications targeted for testing are available.

(1) Specifications targeted for testing

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set “evaluation signal” data on the digital modulation signal generator (SG1). Refer to “Evaluation Signal” for more information.
2. Set SG1 as follows:
   - Frequency: 0 dBm (Frequency shown in the Step 8)
   - Level: (Level shown in the Step 8)
3. Set Spectrum Analyzer as follows
   - Input Terminal: RF
   - Reference Level: 0 dBm (Level shown in the Step 8)
   - Frequency: (Frequency shown in the Step 8)
   - Measuring Object: QPSK
4. Press [F4] (Occupied Bandwidth) to move to the Occupied Bandwidth screen.
5. Execute [F4] (Adjust Range).
6. Press [F1] (Measure Method) to switch the measurement method to FFT.

7. Check that the measured results of the occupied bandwidth is 4.2 ±0.5 MHz.
8. Repeat steps 2 thorugh 7 above, using different frequency shown in the table below.

Frequency	Level (Input level to SG1)		
	MS2681A/MS2683A Pre-amplifer On	MS2681A/MS2683A Pre-amplifer Off	MS2687A/B
50 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB
2000 MHz	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB
3000 MHz*1	−20 dBm±0.1 dB	−10 dBm±0.1 dB	−10 dBm±0.1 dB

Note:

The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Adjacent Channel Leakage Power Measurement <MS268x>

(1) Specifications targeted for testing

<MS2681A/MS2683A>

Input level ≥0 dBm (Pre-amplifier Off), in wide dynamic range mode, and using filtering method.

Code multiplexing	Detuning frequency	Dynamic range
1 CH	5 MHz	≥55 dBc
	10 MHz	≥62 dBc
16 CH *	5 MHz	≥50 dBc
	10 MHz	≥60 dBc

Note:

Only when Option 08 Pre-amplifier not installed

<MS2687A/B>

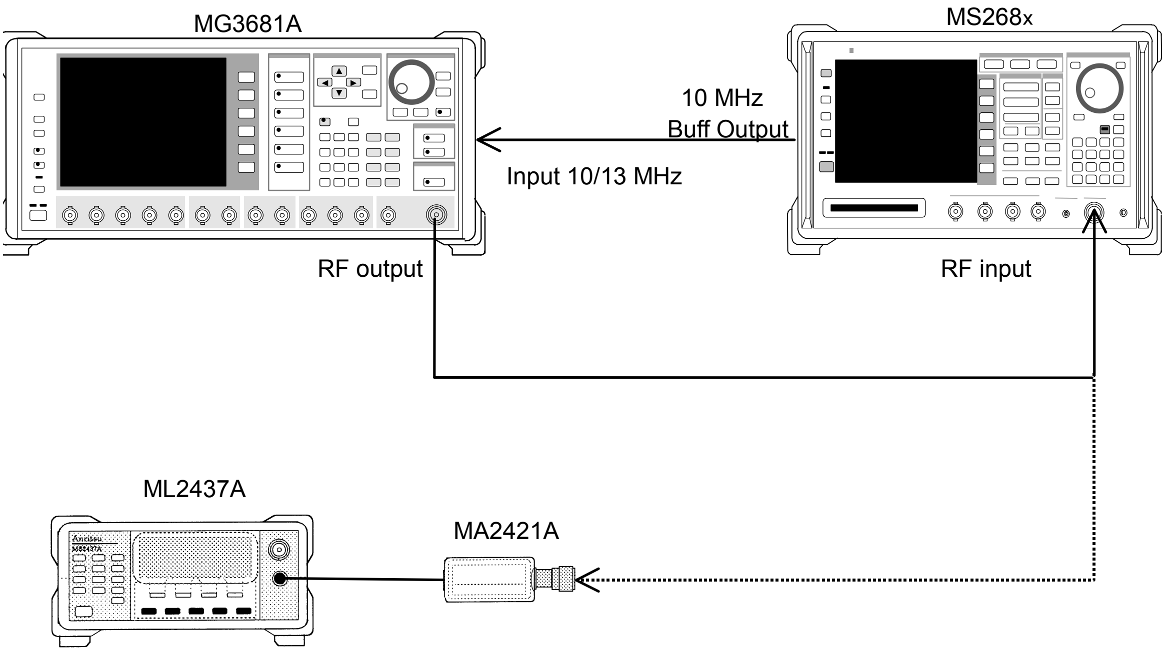
Input level 0 dBm, in wide dynamic range mode, and using filtering method.

Code multiplexing	Detuning frequency	Dynamic range
1 CH	5 MHz	≥55 dBc
	10 MHz	≥62 dBc
16 CH	5 MHz	≥50 dBc
	10 MHz	≥60 dBc

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- Power meter: ML2437A
- Power sensor: MA2421A

(3) Setup



(4) Test procedures

1. Set the digital modulation signal generator (SG1), as follows:
   - Frequency: (Frequency shown in the Step 10)
   - Level: (Level shown in the Step 10)
   - System: W-CDMA
   - Filter: RNYQ
   - Filter Mode: ACP
   - Maximum Code Number: 1
   - Chip Rate: 3.84 Mcps
   - Roll Off Ratio: 0.22
2. Set the Spectrum Analyzer as follows:
   - Input Terminal: RF
   - Reference Level: 0 dBm (Level shown in the Step 10)
   - Frequency: (Frequency shown in the Step 10)
   - Measuring Object: QPSK
   - Trigger: Free Rum
3. Connect SG1 output to the power sensor (MA2421A) and switch SG1 output to ON.
4. Adjust the SG1 level so that the power meter (ML2437A) indicates a value of table below.

5. Connect SG1 output to RF input of the Spectrum Analyzer.
6. Press [F5] (Adjust Channel Power) to move to the Adjacent Channel Power screen.
7. Execute [F4] (Adjust Range).
8. Press [F1] (Measure Method), and set the measurement method to Modulation and the Wide Dynamic Range to On.
9. Check that the measured value meets the specifications by the measured results.
10. Repeat steps 1 thorugh 9 above, while changing the frequency as shown in the table below.
(Change the SG1 Maximum Code Number to 16 at measurement of Code 16 CH, shown in the table below.)

Frequency	Level (Input level to MS268x)			
	MS2681A/MS2683A Pre-amplifier Off		MS2687A/B	
	Code 1 CH	Code 16 CH	Code 1 CH	Code 16 CH
200 MHz	0dBm±0.1dB	−3dBm±0.1dB	0dBm±0.1dB	−3dBm±0.1dB
2000 MHz	0dBm±0.1dB	−3dBm±0.1dB	0dBm±0.1dB	−3dBm±0.1dB
3000 MHz	0dBm±0.1dB	−3dBm±0.1dB	0dBm±0.1dB	−3dBm±0.1dB

Spurious Measurement <MS268x>

(1) Specifications targeted for testing

<MS2683A>

- Measurement range

Carrier frequency: 1,800 to 2,200 MHz

≥80 dB (RBW: 1 kHz)
(9 to 150 kHz, band 0)

≥80 dB (RBW: 10 kHz)
(150 kHz to 30 MHz, band 0)

≥80 dB (RBW: 100 kHz)
(30 MHz to 1 GHz, band 0)

≥76 − f [GHz] dB (RBW: 1 MHz)
(1 to 3.15 GHz, band 0, in Normal mode)

≥77 dB (RBW: 1 MHz)
(3.15 to 7.8 GHz band 1, in spurious mode)

When Option 03 Pre-selector is installed

≥77 dB (RBW: 1 MHz)
(1.6 to 7.8 GHz band 1, in spurious mode)

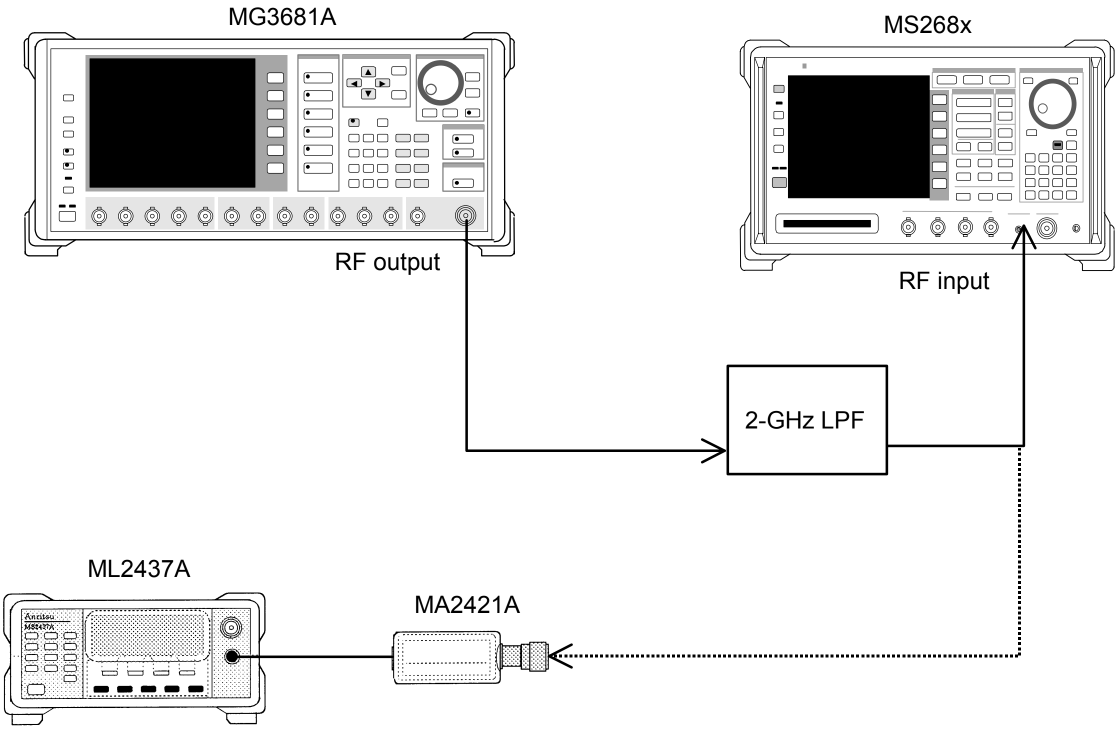
Note, however, that in the carrier frequency range of 2,030.354 to 2,200 MHz, a spurious is generated with the following relationship.

f(Spurious) = f(in) − 2,030.345 MHz

(2) Measuring instruments used in testing

- Digital modulation signal generator (SG1): MG3681A
- 2-GHz LPF
- Power Meter: ML2437A
- Power sensor:MA2421A

(3) Setup



(4) Test procedures

1. Set the frequency and output level of the digital modulation signal generator (SG1), as shown in the table below.
   Combination of the test frequency with level is shown in the table below

Frequency	Level (indication value by built-in power meter)
	MS268x
2000 MHz	0 dBm±0.1 dB

2. Set the Spectrum Analyzer as follows:
   - Input Terminal: RF
   - Reference Level: 0 dBm
   - Frequency: 2000 MHz
   - Measuring Object: QPSK
   - Filter: Filtering
   - Trigger: Free Rum
3. Connect 2-GHz LPF output to the power sensor (ML2421A).
4. Adjust the SG1 level so that the power meter (ML2437A) indicaates a value of 0 dBm±0.1 dB.
5. Connect 2-GHz LPF output to RF input of the Spectrum Analyzer.
6. Move to the function label back to the first page, and press F6 (Spurious Emission) to move the Spurious Emission screen.
7. Press F1 (Spurious Mode), and select F3 (Sweep).
   After completion of this setting, press F6 (return).
8. Press F3 (Setup Search/Sweep Table), and set table 1.0.
   After completion of this setting, press F6 (Back Screen).
9. Press (More) to display the second page of the function label.
   Press F4 (Preselector), and select Normal mode.
10. Move the function label back to the first page.

    Note:

    Steps 9 and 10 above can be set only when Option 03 Pre-selector is installed.
11. Execute F5 (Adjust Range).
12. Check that the measured results meet specifieations.
13. Make the following setting when Option 03 Pre-selector is installed.
14. Press (More) to display the second page of the function label, after pressing F3 (Setup Search/Sweep Table).
15. Press F2 to clear the frequency table.
16. Set Table 1.1.
    After completion of the setting, press F6 (Back Screen).
17. Press (More) to display the second page of the funcion label.
    Press F4 (Preselector), and select Spurious mode.
18. Move the function label back to the first page.
19. Repeat steps 11 and 12.

Table 1.0

	Start Frequency	Stop frequency	RBW
f1	9 kHz	50 kHz	1 kHz
f2	50 kHz	150 kHz	1 kHz
f3	150 kHz	10 MHz	10 kHz
f4	10 MHz	30 MHz	10 kHz
f5	30 MHz	950 MHz	100 kHz
f6	1050 MHz	1950 MHz	1 MHz
f7	2050 MHz	3200 MHz	1 MHz
f8	3200 MHz	7800 MHz	1 MHz

Table 1.1

	Start Frequency	Stop frequency	RBW
f1	1600 MHz	1950 kHz	1 MHz
f2	2050 MHz	3150 kHz	1 MHz

CCDF Measurement <MS268x>

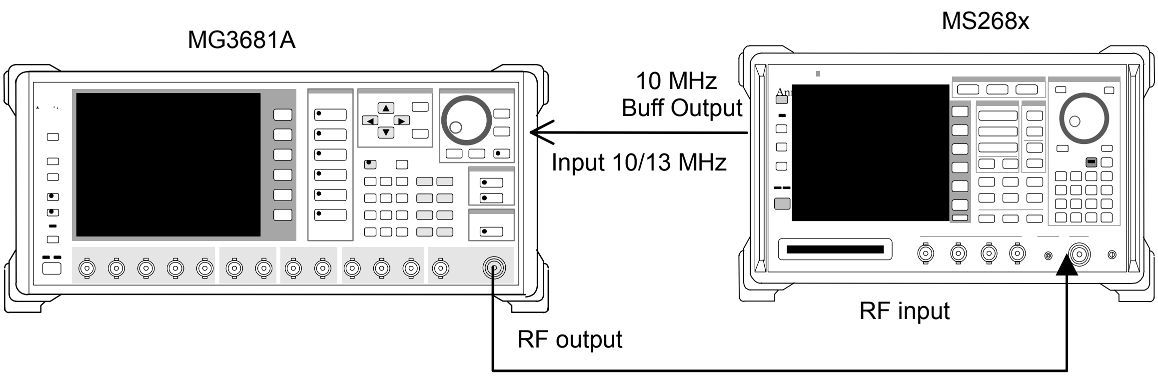
(1) Specifications targeted for testing

This is no specifications targeted for testing since this test is a function test.

(2) Measuring instruments used in testing

- Digital Modulation Signal Generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set the Digital Modulation Signal Generator (SG1) as follows:
   - Frequency: (Frequency shown in the Step 8)
   - Level: (Level shown in the Step 8)
   - System: W-CDMA
   - Filter: RNYQ
   - Filter Mode: EVM
   - Maximum Code Number: 1
   - Chip Rate: 3.84 Mcps
   - Roll Off Ratio: 0.22
2. Set the Spectrum Analyzer as follows
   - Input Terminal: RF
   - Reference Level: 0 dBm (Level shown in the Step 8)
   - Frequency: 50 MHz (Frequency shown in the Step 8)
   - Measuring Object: QPSK
3. Press [ ] (More) to display the second page of the function labal.
4. Press [F3] (CCDF) to go to the CCDF screen.

5. Execute [F4] (Adjust Range).
6. Press [F1] (Measure Method), and set the measurement procedure to "CCDF."
7. Confirm that the measured value at "0.0001%" reads "5.6 dB±1 dB".
8. Change the frequency and repeat the steps from 2 to 7.

Frequency	Level (Input level to SG1)		
	MS2681A/MS2683A Pre-amplifer On	MS2681A/MS2683A Pre-amplifer Off	MS2687A/B
50 MHz	−30 dBm	−20 dBm	−20 dBm
2000 MHz	−30 dBm	−20 dBm	−20 dBm
3000 MHz*	−30 dBm	−20 dBm	−20 dBm

*The maximum frequency when Option 08 Preamble is installed is 2300MHz.

IQ Input Modulation Accuracy <MS268x>

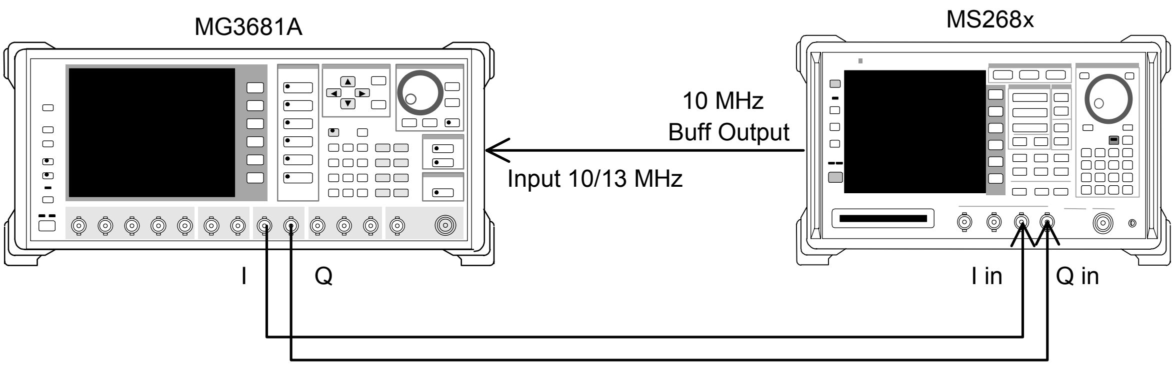
(1) Specifications targeted for testing

Residual vector error: < 2% (rms), DC coupling.
(When Option MS2681A-17, MS2681A-18, MS2683A-17, MS2683A-18, or MS2687A/B-18 is installed.)

(2) Measuring instruments used in testing

- Digital Modulation Signal Generator (SG1): MG3681A

(3) Setup



(4) Test procedures

1. Set the signal data of the digital modulation signal generator (MG3681A) to “Evaluation signal”. Refer to “Evaluation signal” for more information.
2. Set the Spectrum Analyzer as follows:
   - Input Terminal: IQ-DC
   - Impedance: 50 Ω
   - Measuring Object: Down Link
   - Filter: Filtering
   - Scrambling Code Sync & Number: Set = 0000
   - Spreading Factor: 512
   - Channelization Code: 0
   - Trigger: Free Run
3. Press F2 (Modulation Analysis) to Modulation Analysis screen.
4. Press F4 (Analysis Mode), then press F1 (Analysis Start), and set Analysis Start to 0. Press F2 (Analysis Length), and set Analysis Length to 2,560 chips. Press F6 (return).
5. Move the function label to the fourth page, and set F1 (Exclude EVM Origin Ofst.) to On.
6. Confirm that the residual vector meets specifications.

Evaluation Signal <MS268x>

The "evaluation signal" described in this section is set as follows.
This section explains the evaluation signal required to implement a performance test. Set the evaluation signal on the Digital Modulation Signal Generator that you use.

General information on evaluation signal

- Spreading factor: 512
- Channelization Code: 0, 63, 127, 255, and 511 (5 code multiplexing)
- Signal under the System Format for Scrambling Code = 0x00000
- Power ratios are as follows.

Power ratio for each code

Power ratio

Code 0	:	−2.44 dB
Code 63	:	−5.0 dB
Code 127	:	−10.0 dB
Code 255	:	−20.0 dB
Code 511	:	−25.0 dB

Example of Performance Test Results Sheet

This is an example of the test result sheet used to for the performance test of the MS860xA Digital Mobile Radio Transmitter Tester/MS268x Spectrum Analyzer.
Copy this page and use it for performance tests.

Test site ______________________ Report No. ______________________
______________________ Date ______________________
______________________ Test supervisor ______________________

Equipment name ______________________________________
____

Serial No. ______________________ Ambient temperature ______________________℃
Power-supply frequency______________ Hz Relative humidity ______________________%

Note: ____
____
____

Modulation/Frequency Measurement

Frequency/modulation measurement accurary (for High Power Input)

		50 MHz	2000 MHz	3000 MHz*[1]
Residual vector error	Minimum value	0 %		
	Measured value	______ %	______ %	______ %
	Maximum value	1.8 %		
	Measurement uncertainty	0.2 %		
Carrier frequency	Minimum value	−9.9 Hz		
	Measured value	______ Hz	______ Hz	______ Hz
	Maximum value	+9.9 Hz		
	Measurement uncertainty	±0.1 Hz		

Frequency/modulation measurement accurary (for Low Power Input)

		50 MHz	2000 MHz	3000 MHz*1
Residual vector error	Minimum value	0 %		
	Measured value	______ %	______ %	______ %
	Maximum value	1.8 %		
	Measurement uncertainty	0.2 %		
Carrier frequency	Minimum value	−9.9 Hz		
	Measured value	______ Hz	______ Hz	______ Hz
	Maximum value	+9.9 Hz		
	Measurement uncertainty	±0.1 Hz		

Frequency/modulation measurement accurary (for Low Power Input with Pre-apmlifier On)

		50 MHz	2000 MHz	3000 MHz*1
Residual vector error	Minimum value	0 %		
	Measured value	______ %	______ %	______ %
	Maximum value	1.8 %		
	Measurement uncertainty	0.2 %		
Carrier frequency	Minimum value	−9.9 Hz		
	Measured value	______ Hz	______ Hz	______ Hz
	Maximum value	+9.9 Hz		
	Measurement uncertainty	±0.1 Hz		

Expected origin offset value

	50 MHz	2000 MHz	3000 MHz*1
Expected value	______ dB	______ dB	______ dB

Origin offset (for High Power Input)

	50 MHz	2000 MHz	3000 MHz*1
Measured result	______ dB	______ dB	______ dB
Upper limit value	+0.46 dB		
Origin offset accuracy*2	______ dB	______ dB	______ dB
Lower limit value	−0.46 dB		
Measurement uncertainty	±0.04 dB		

Origin offset (for Low Power Input)

	50 MHz	2000 MHz	3000 MHz*1
Measured result	______ dB	______ dB	______ dB
Upper limit value	+0.46 dB		
Origin offset accuracy*2	______ dB	______ dB	______ dB
Lower limit value	−0.46 dB		
Measurement uncertainty	±0.04 dB		

Origin offset (for Low Power Input with Pre-amplifier On)

	50 MHz	2000 MHz	3000 MHz*1
Measured result	______ dB	______ dB	______ dB
Upper limit value	+0.46 dB		
Origin offset accuracy*2	______ dB	______ dB	______ dB
Lower limit value	−0.46 dB		
Measurement uncertainty	±0.04 dB		

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

*2: Origin offset accuracy [dB] = Measured result − Expected origin offset value

Code Domain Measurement

Code domain power measurement accuracy (for Low Power Input)

Code No.		50 MHz	2000 MHz	3000 MHz*1
0	Upper limit value	−2.36 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−2.52 dB		
63	Upper limit value	−4.92 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−5.08 dB		
127	Upper limit value	−9.92 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−10.08 dB		
255	Upper limit value	−19.72 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−20.28 dB		
511	Upper limit value	−24.72 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−25.28 dB		
Measurement uncertainty		±0.02 dB		

Code domain power measurement accuracy (for Low Power Input with Pre-amplifier On)

Code No.		50 MHz	2000 MHz	3000 MHz*1
0	Upper limit value	−2.36 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−2.52 dB		
63	Upper limit value	−4.92 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−5.08 dB		
127	Upper limit value	−9.92 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−10.08 dB		
255	Upper limit value	−19.72 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−20.28 dB		
511	Upper limit value	−24.72 dB		
	Measured value	______ dB	______ dB	______ dB
	Lower limit value	−25.28 dB		
Measurement uncertainty		±0.02 dB		

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Transmitter Power Measurement Accuracy

Value indicated by power meter

		50 MHz	2000 MHz	3000 MHz*1
Value indicated by power meter	Upper limit value	+10.1 dBm		
	Indicated value	_____ dBm	_____ dBm	_____ dBm
	Lower Limit value	−9.9 dBm		

True attenuation of MP721D (Attenuation from +0.5 dBm)

Frequency	50 MHz	2000 MHz	3000 MHz*1
Attenuation	_____ dB	_____ dB	_____ dB

Transmitter power measurement accuracy (for High Power Input)

		50 MHz	2000 MHz	3000 MHz*1
Measurement accuracy	Upper limit value	+0.23 dBm		
	Indicated value	_____ dBm	_____ dBm	_____ dBm
	Lower Limit value	−0.23 dBm		
	Measurement unucertainry	±1.7 dB		

Measurement accuracy [dB] = Tx Power value − Value indicated by power meter

Transmitter power measurement accuracy (for Low Power Input)

		50 MHz	2000 MHz	3000 MHz*1
Measurement accuracy	Upper limit value	+0.23 dBm		
	Indicated value	_____ dBm	_____ dBm	_____ dBm
	Lower Limit value	−0.23 dBm		
	Measurement unucertainry	±0.17 dB		

Measurement accuracy [dB] = Tx Power value − (Value indicated by power meter − True attenuation of MP721D)

Transmitter power measurement accuracy (for Low Power Input with Pre-amplifier On)

		50 MHz	2000 MHz	3000 MHz*1
Measurement accuracy	Upper limit value	+0.23 dBm		
	Indicated value	_____ dBm	_____ dBm	_____ dBm
	Lower Limit value	−0.23 dBm		
	Measurement unucertainry	±0.17 dB		

Measurement accuracy [dB] = Tx Power value − (Value indicated by power meter − True attenuation of MP721D)

*1: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Linearity

SG1 set value at each frequency for +0.5 dBm caliblation

		50 MHz	2000 MHz	3000MHz *3
SG1 set value	Set_Ref	______ dBm	______ dBm	______ dBm

Linearity accuracy (for High Power Input)

Frequency (MHz)	SG level (dBm)	Value measured by caliblation reciever (dB)	Value measured by tester (dBm)	Caliblated linearity value (dB) *2	Effective range (dB)
50	+10	-----	______ dBm*1		
	0	______ dB	______ dBm	______ dB	±0.16 dB
	-10	______ dB	______ dBm	______ dB	±0.16 dB
	-20	______ dB	______ dBm	______ dB	±0.16 dB
	-30	______ dB	______ dBm	______ dB	±0.16 dB
2000	+10	-----	______ dBm*1		
	0	______ dB	______ dBm	______ dB	±0.16 dB
	-10	______ dB	______ dBm	______ dB	±0.16 dB
	-20	______ dB	______ dBm	______ dB	±0.16 dB
	-30	______ dB	______ dBm	______ dB	±0.16 dB
3000 *3	+10	-----	______ dBm*1		
	0	______ dB	______ dBm	______ dB	±0.16 dB
	-10	______ dB	______ dBm	______ dB	±0.16 dB
	-20	______ dB	______ dBm	______ dB	±0.16 dB
	-30	______ dB	______ dBm	______ dB	±0.16 dB
Measurement uncertainty		±0.04 dB			

Linearity accuracy (for Low Power Input)

Frequency (MHz)	SG level (dBm)	Value measured by caliblation reciever (dB)	Value measured by tester (dBm)	Caliblated linearity value (dB) *2	Effective range (dB)
50	−10	-----	______ dBm*1		
	−20	______ dB	______ dBm	______ dB	±0.16 dB
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
2000	−10	-----	______ dBm*1		
	−20	______ dB	______ dBm	______ dB	±0.16 dB
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
3000 *3	−10	-----	______ dBm*1		
	−20	______ dB	______ dBm	______ dB	±0.16 dB
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
Measurement uncertainty		±0.04 dB			

Linearity accuracy (for Low Power Input with Pre-amplifier On)

Frequency (MHz)	SG level (dBm)	Value measured by caliblation reciever (dB)	Value measured by tester (dBm)	Caliblated linearity value (dB) *2	Effective range (dB)
50	−20	-----	______ dBm*1		
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
	−60	______ dB	______ dBm	______ dB	±0.16 dB
2000	−20	-----	______ dBm*1		
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
	−60	______ dB	______ dBm	______ dB	±0.16 dB
3000 *3	−20	-----	______ dBm*1		
	−30	______ dB	______ dBm	______ dB	±0.16 dB
	−40	______ dB	______ dBm	______ dB	±0.16 dB
	−50	______ dB	______ dBm	______ dB	±0.16 dB
	−60	______ dB	______ dBm	______ dB	±0.16 dB
Measurement uncertainty		±0.04 dB			

*1: Measure_Ref

*2: Method for calculating linearity value
Calculated linearity value (dB) = Value measured by tester (dBm) − {Measure_Ref (dBm) − Value measured by calibration receiver (dB)}

*3: The upper frequency limit is 2300 MHz when Option 08 Pre-amplifier is installed.

Adjacent Channel Leakage Power Measurement

Adjacent channel leakage power measurement range (for Low Power Input)

Number of code multiplexities	Detuning frequency	200 MHz	2000 MHz	3000 MHz	Measurement uncritanty	Effective lower limit value
1 CH	−10 MHz	______ dB	______ dB	______ dB	1 dB	63 dB
	−5 MHz	______ dB	______ dB	______ dB		56 dB
	+5 MHz	______ dB	______ dB	______ dB		56 dB
	+10 MHz	______ dB	______ dB	______ dB		63 dB
16 CH	−10 MHz	______ dB	______ dB	______ dB		61 dB
	−5 MHz	______ dB	______ dB	______ dB		51 dB
	+5 MHz	______ dB	______ dB	______ dB		51 dB
	+10 MHz	______ dB	______ dB	______ dB		61 dB

Adjacent channel leakage power measurement range (for Low Power Input with Option 08 Pre-amplifier Installed) *1

Number of code multiplexities	Detuning frequency	200 MHz	2000 MHz	3000 MHz	Measurement uncritanty	Effective lower limit value
1 CH	−10 MHz	______ dB	______ dB	______ dB	1 dB	63 dB
	−5 MHz	______ dB	______ dB	______ dB		56 dB
	+5 MHz	______ dB	______ dB	______ dB		56 dB
	+10 MHz	______ dB	______ dB	______ dB		63 dB

*1: Measurement is performed with Option 08 Pre-amplifier installed (with Pre-amplifier Off).

IQ Input Modulation Accuracy

Modulation measurement accuracy (IQ input)

Residual vector error	Minimum value	0%
	Measured value	______ %
	Maximum value	1.8%
	Measeurement uncertainty	0.2%

Power Meter Accuracy

Value indicated by power meter (Set_Ref)

		50 MHz	2000 MHz	3000 MHz
SG set value (Set_Ref)	-----	______ dB	______ dB	______ dB
Value indicated by power meter (Read_Ref)	Upper limit value	+10.1 dBm		
	Indicated value	______ dB	______ dB	______ dB
	Lower limit value	−9.9 dBm		

Value measured by ML2530A when attenuation of programmable attenuator (ATT) is changed. (ATT_n)*1

ATT set value	ATT_n	50 MHz	2000 MHz	3000 MHz
10 dB	ATT_10	______ dB	______ dB	______ dB
20 dB	ATT_20	______ dB	______ dB	______ dB
30 dB	ATT_30	______ dB	______ dB	______ dB

Measurement accuracy (for Low Power Input)

Frequency (MHz)	Input level (dBm)	SG & ATT set value	Value measured by tester (dBm)	Measurement accuracy (%)*2	Effective range (dB)
50	+10	Set_Ref	______ dBm	______ dB	±5.8%
	0	Set_Ref + ATT: 10 dB	______ dBm	______ dB	±5.8%
	−10	Set_Ref + ATT: 20 dB	______ dBm	______ dB	±5.8%
	−20	Set_Ref + ATT: 30 dB	______ dBm	______ dB	±5.8%
2000	+10	Set_Ref	______ dBm	______ dB	±5.8%
	0	Set_Ref + ATT: 10 dB	______ dBm	______ dB	±5.8%
	−10	Set_Ref + ATT: 20 dB	______ dBm	______ dB	±5.8%
	−20	Set_Ref + ATT: 30 dB	______ dBm	______ dB	±5.8%
3000	+10	Set_Ref	______ dBm	______ dB	±5.8%
	0	Set_Ref + ATT: 10 dB	______ dBm	______ dB	±5.8%
	−10	Set_Ref + ATT: 20 dB	______ dBm	______ dB	±5.8%
	−20	Set_Ref + ATT: 30 dB	______ dBm	______ dB	±5.8%
Measurement uncertainty			±4.2%		

*1: ATT_n is a negative value

*2: Method for calculating measurement accuracy

$$\text{Measurement accuracy}[\%] = \left(\frac{10^{([\text{Value measured by tester}]/10)}}{10^{(Read\_Ref + ATT\_n)/10}} - 1 \right) \times 100$$

MX860801A/MX860901A/
MX268101A/MX268301A/MX268701A/
MX860801B/MX860901B/
MX268101B/MX268301B/MX268701B
W-CDMA Measurement Software
(For MS8608A/MS8609A/MS2681A/
MS2683A/MS2687A/MS2687B)
Operation Manual
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11th Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS8608A/MS8609A Digital Mobile Radio Transmitter Tester Manual or MS2681A/MS2683A/MS2687A/MS2687B Spectrum Analyzer Operation Manual. Please also refer to this document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W1746AE-11.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

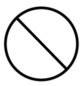
DANGER ⚠ This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

WARNING ⚠ This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

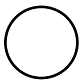
CAUTION ⚠ This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

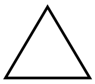
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



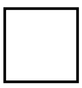
This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



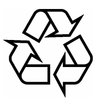
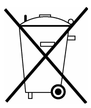
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.



This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

MX860801A/MX860901A/MX268101A/MX268301A/MX268701A/
MX860801B/MX860901B/MX268101B/MX268301B/MX268701B
W-CDMA Measurement Software (For MS8608A/MS8609A/MS2681A/MS2683A/MS2687A/MS2687B)
Operation Manual
Volume 2 of 2

11 April 2000 (First Edition)
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Printed in Japan

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Front Panel Power Switch

To prevent malfunction caused by accidental touching, the front power switch of this equipment turns on the power if it is pressed continuously for about one second in the standby state. If the switch is pressed continuously for one second in the power-on state, the equipment enters the standby state.

In the power-on state, if the power plug is removed from the outlet, then reinserted into it, the power will not be turned on. Also, if the lines is disconnected due to momentary power supply interruption or power failure, the power will not be turned on (enters the standby state) even if the line is recovered.

This is because this equipment enters the standby state and prevents incorrect data from being acquired when the line has to be disconnected and reconnected.

For example, if the sweep time is 1,000 seconds and data acquisition requires a long time, momentary power supply interruption (power failure) might occur during measurement and the line could be recovered automatically to power-on. In such a case, the equipment may mistake incorrect data for correct data without recognizing the momentary power supply interruption.

If this equipment enters the standby state due to momentary power supply interruption or power failure, check the state of the measuring system and press the front power switch to restore power to this equipment.

Further, if this equipment is built into a system and the system power has to be disconnected then reconnected, the power for this equipment must also be restored by pressing the front power switch.
Consequently, if this equipment is built into remote monitoring systems that use MODEMs, please install option 46 "Auto Power Recovery" to equipment.

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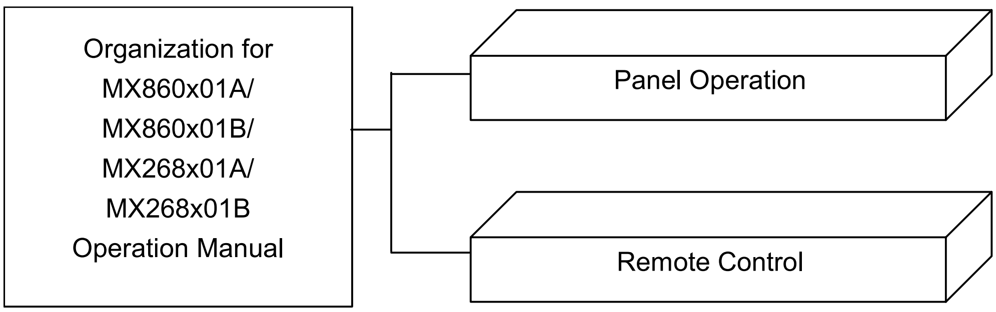
About This Manual

1. This operation manual provides the explanation of the MX860801A/MX860901A/MX268101A/MX268301A/MX268701A/MX860801B/MX860901B/MX268101B/MX268301B/MX268701B W-CDMA Measurement Software when it is installed in the MS8608A/MS8609A Digital Mobile Radio Transmitter Tester and the MS2681A/MS2683A/MS2687A/MS2687B Spectrum Analyzer.
   In this manual, MS8608A/MS8609A is described as MS860x, and MS2681A/MS2683A/MS2687A/MS2687A/MS2687B is described as MS268x.

2. Organization of this manual
   The W-CDMA Measurement Software operation manual is made up of the two parts shown below.



Panel Operation:

Describes the overview, panel explanation, operations and performance test for the W-CDMA Measurement Software.

Remote Control:

Describes the remote control of the W-CDMA Measurement Software via RS-232C/GPIB interface.

II.

MX860801A/MX860901A/MX268101A/MX268301A/ MX268701A/MX860801B/MX860901B/MX268101B/ MX268301B/MX268701B

W-CDMA Measurement Software

(For MS8608A/MS8609A/MS2681A/ MS2683A/MS2687A/MS2687B)

Operation Manual

(Remote Control)

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Section 1 General

This section outlines the remote control and gives examples of system upgrades.

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General

The MS860x/MS268x, when combined with an external controller (host computer, personal computer, etc.), can automate your measurement system. For this purpose, the MS860x/MS268x is equipped with an RS-232C interface port, and GPIB interface bus (IEEE std 488.2-1987) as standard compositions. Ethernet interface can be also installed as an option.

Remote control functions

The remote control functions of the MS860x/MS268x are used to do the following:

(1) Control all functions except a few like the power switch and [LOCAL] key.

(2) Read all parameter settings.

(3) Set the RS-232C interface settings from the panel.

(4) Set the GPIB address from the panel.

(5) Set the IP address for Ethernet interface from the panel. (Optional)

(6) Select the interface port from the panel.

(7) Configure the automatic measurement system when the spectrum analyzer function is combined with a personal computer and other measuring instruments.

Interface port selection functions

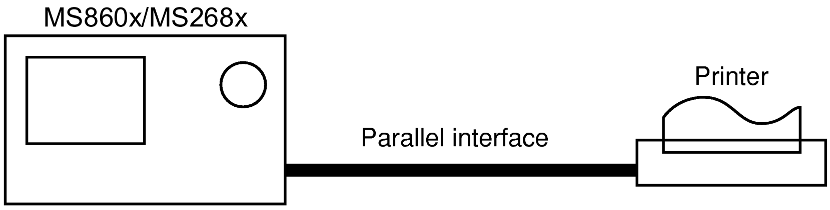
The MS860x/MS268x has RS-232C interface, GPIB interface bus and parallel (Centronics) interface. It can also have Ethernet interface as an option. Use the panel to select the interface port to be used to connect external devices as shown below.

Port for the external controller	:Select RS-232C/GPIB/Ethernet (Option).
Port for the printer	:Parallel interface.

Examples of system upgrades using RS-232C and GPIB

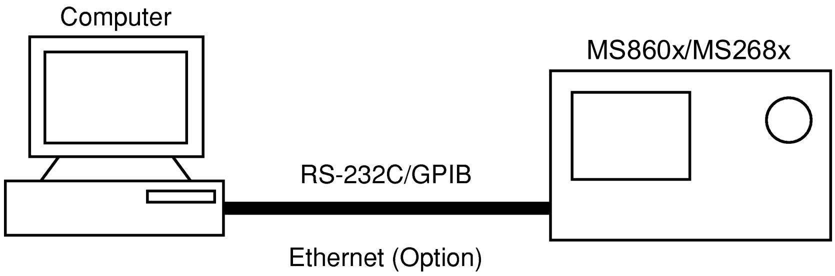
(1) Stand-alone type

Waveforms measured with MS860x/MS268x are output to the printer.



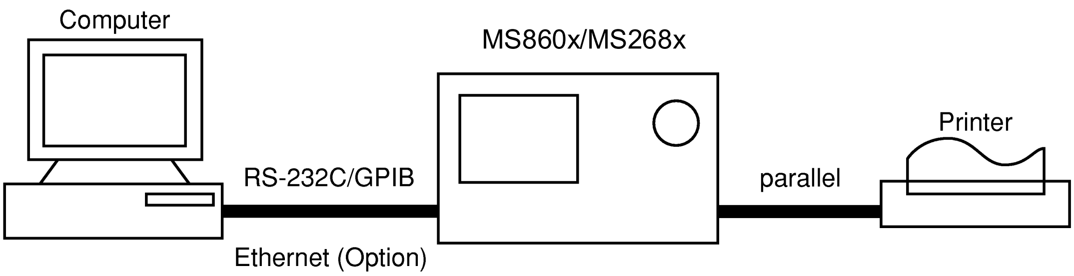
(2) Control by the host computer (1)

The MS860x/MS268x is controlled automatically or remotely from the computer.



(3) Control by the host computer (2)

The waveforms measured by controlling MS860x/MS268x automatically or remotely are output to the printer.



Specifications of RS-232C

The table below lists the specifications of the RS-232C provided as standard in MS860x/MS268x.

Item	Specification
Function	Control from the external controller (except for power-ON/OFF)
Communication system	Asynchronous (start-stop synchronous system), half-duplex
Communication control system	X-ON/OFF control
Baud rate	1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 56 k, 115 k (bps)
Data bits	7 or 8 bits
Parity	ODD, EVEN, NON
Start bit	1 bit
Stop bit (bits)	1 or 2 bits
Connector	D-sub 9-pin, male

Specifications of GPIB

The table below lists the specifications of the GPIB provided as standard in MS860x/MS268x.

Item	Specification and supplementary explanation
Function	Conforms to IEEE488.2 The MS860x/MS268x is controlled from the external controller (except for power-on/off).
Interface function	SH1: All source handshake functions are provided. Synchronizes the timing of data transmission. AH1: All acceptor handshake functions are provided. Synchronizes the timing of data reception. T6: The basic talker functions and serial poll function are provided. The talk only function is not provided. The talker can be canceled by MLA. L4: The basic listener functions are provided. The listen only function is not provided. The listener can be canceled by MTA. SR1: All service request and status byte functions are provided. RL1: All remote/local functions are provided. The local lockout function is provided. PP0: The parallel poll functions are not provided. DC1: All device clear functions are provided. DT1: Device trigger functions are provided. C0: System controller functions are not provided. E2: Output is tri-state.

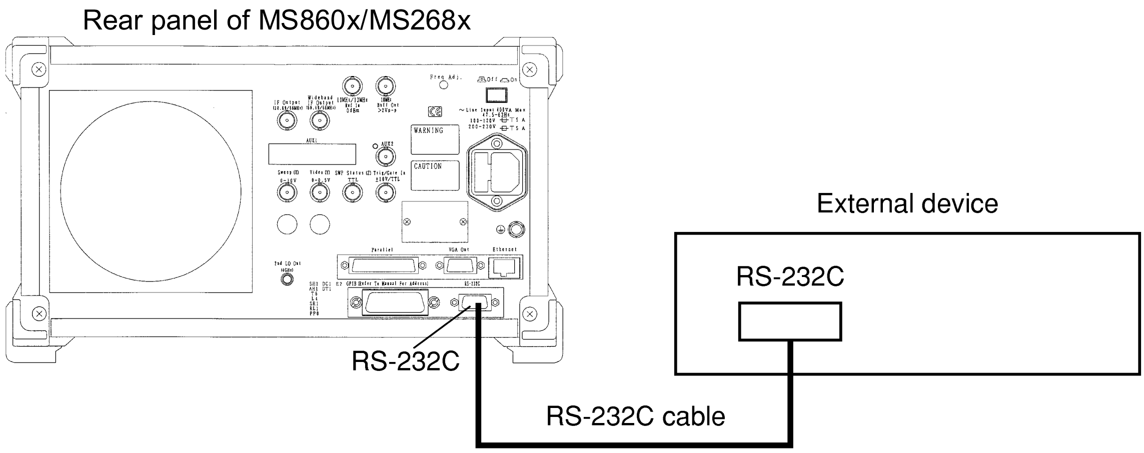
Section 2 Connecting Device

This section describes how to connect external devices such as the host computer, personal computer, and printer to the MS860x/MS268x with RS-232C and GPIB cables. This section also describes how to setup the interfaces of the analyzer function.

Connecting External Device with RS-232C Cable 2-3
Connection Diagram of RS-232C Interface Signals 2-4
Connecting Device with GPIB Cable 2-5
Setting GPIB Address 2-6

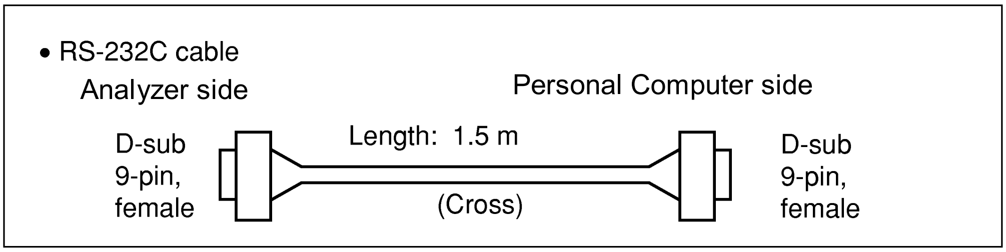
Connecting External Device with RS-232C Cable

Connect the RS-232C connector (D-sub 9-pin, male) on the rear panel of MS860x/MS268x to the RS-232C connector of the external device with an RS-232C cable.



Note:

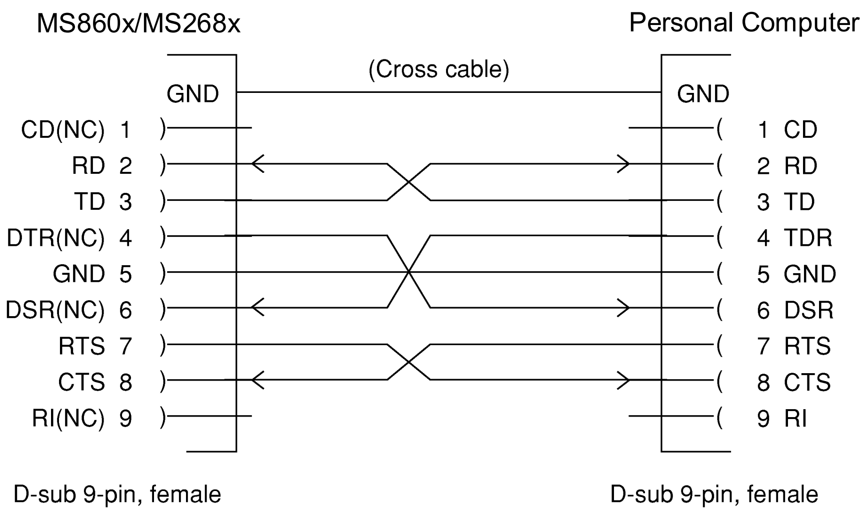
RS-232C connectors with 9 pins and 25 pins are available. When purchasing the RS-232C cable, check the number of pins on the RS-232C connector of the external device. Also, the following RS-232C cable is provided as peripheral parts of MS860x/MS268x.



Connection Diagram of RS-232C Interface Signals

The diagram below shows the RS-232C interface signal connections between MS860x/MS268x and a personal computer.

Connection with Personal Computer



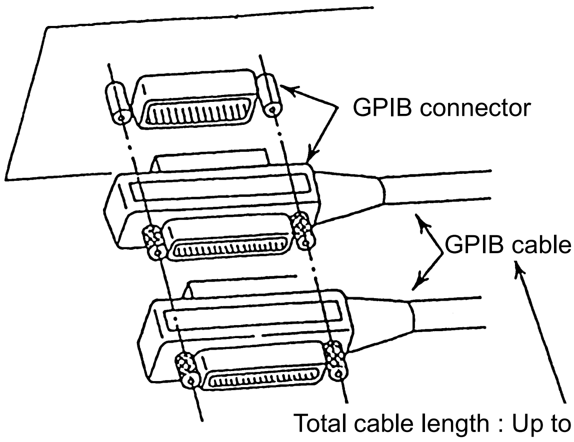
Connecting Device with GPIB Cable

Connect the GPIB connector on the rear panel of MS860x/MS268x to the GPIB connector of an external device with a GPIB cable.

Note:

Be sure to connect the GPIB cable before turning MS860x/MS268x power on.

Up to 15 devices, including the controller, can be connected to one system. Connect devices as shown below:



Total cable length : Up to 20 m
Cable length between devices : Up to 4 m
Number of devices that can be connected : Up to 15

Setting GPIB Address

Set the GPIB address of MS860x/MS268x as follows.

[Config] → Interface → (move cursor) My Address 1 → [Set]

Use the ten-key pad or the rotary knob to enter the GPIB address of MS860x/MS268x, next push [Set] key to confirm address.

Section 3 Device Message Format

This section describes the format of the device messages transmitted on the bus between a controller (host computer) and the device MS860x/MS268x via the RS-232C, GPIB or Ethernet system.

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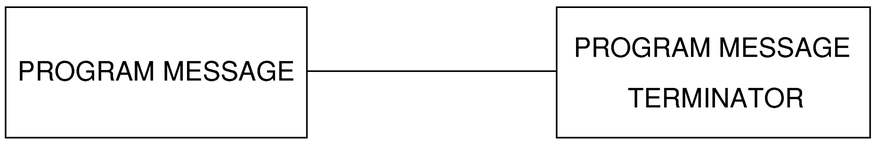
Program Message Format.. 3-3
Response Message Format 3-8

General Description

The device messages are data messages transmitted between the controller and devices, program messages transferred from the controller to this instrument (device), and response messages input from this instrument (device) to the controller. There are also two types of program commands and program queries in the program message. The program command is used to set this instrument's parameters and to instruct it to execute processing. The program query is used to query the values of parameters and measured results.

Program Message Format

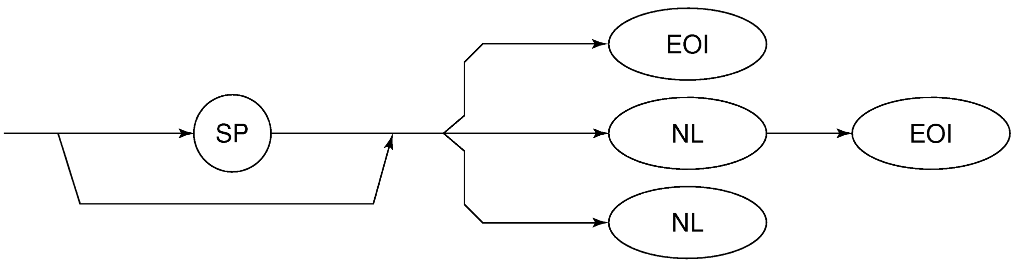
To transfer a program message from the controller program to this instrument using the WRITE statement, the program message formats are defined as follows.




```
WRITE  #1,"CF :1GHZ"
```

PROGRAM MESSAGE: When the program message is transmitted from the controller to this instrument, the specified terminator is attached to the end of the program message.

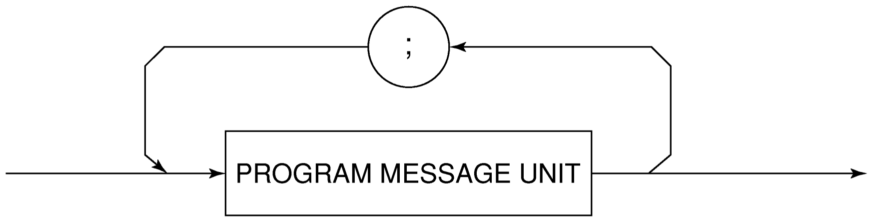
(1) PROGRAM MESSAGE TERMINATOR



NL: Called New line or LF (Line Feed)

Carriage Return (CR) is ignored and is not processed as a terminator.

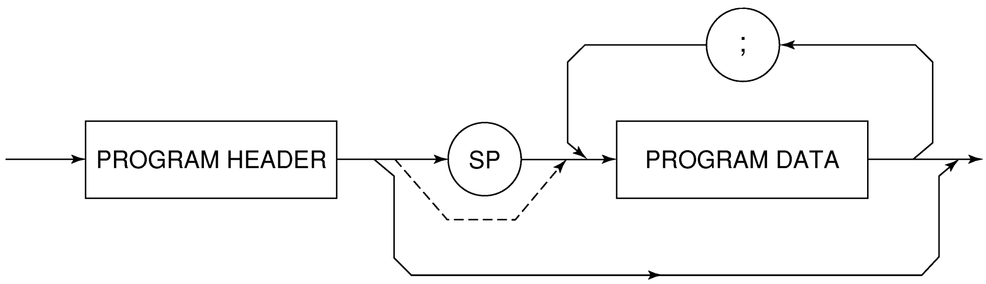
(2) PROGRAM MESSAGE



Multiple program message units can be output sequentially by separating then with a semicolon.

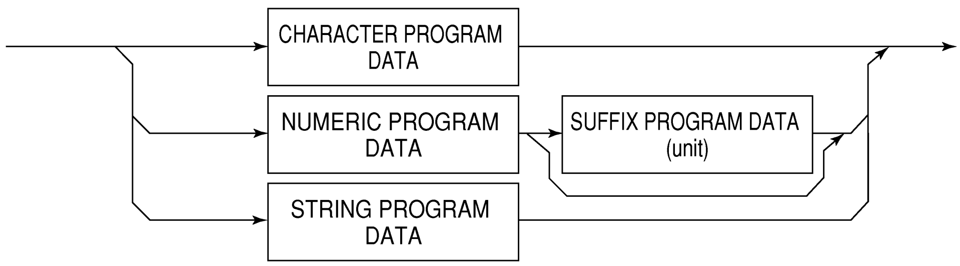
<Example> `WRITE #1;"CF 1GHZ;SP 5ØØKHZ"`

(3) PROGRAM MESSAGE UNIT



- The program header of an IEEE488.2 common command always begins with an asterisk.
- For numeric program data, the SP between the header and data can be omitted.
- The program header of a program query always ends with a question mark.

(4) PROGRAM DATA



(5) CHARACTER PROGRAM DATA

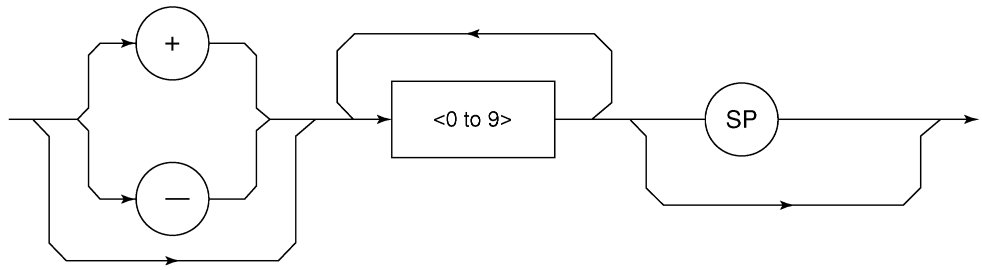
Character program data is specific character string data consisting of the uppercase alphabetic characters from A to Z, lowercase alphabetic characters from a to z, numbers 0 to 9, and underline (_).

<Example> `WRITE #1;"ST AUTO"` ....Sets Sweep Time to "AUTO".

(6) NUMERIC PROGRAM DATA

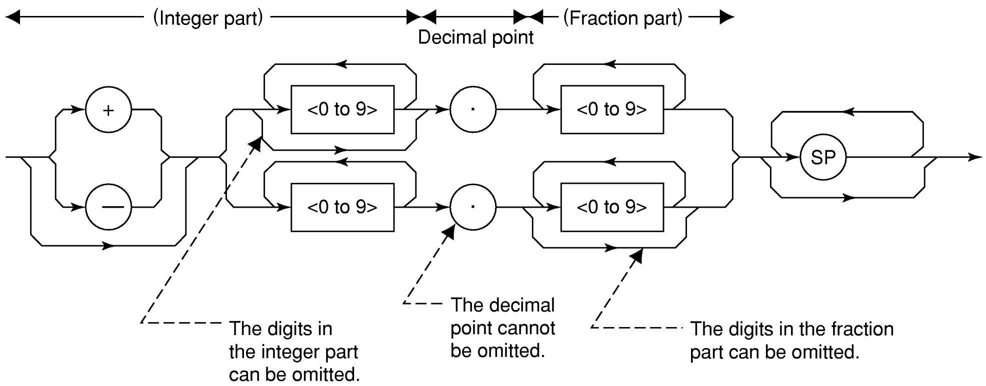
Numeric program data has two types of formats: integer format (NR1) and fixed-point format (NR2).

< Integer format (NR1) >



- Zeros can be inserted at the beginning → 005, +000045
- There must be no spaces between a + or − sign and a number → +5, + △5 (×)
- Spaces can be inserted after a number → +5△△△
- The + sign is optional → +5, 5
- Commas cannot be used to separate digits → 1,234,567 (×)

< Fixed-point format (NR2) >



- The numeric expression of the integer format applies to the integer part.
- There must be no spaces between numbers and the decimal point → +753△ .123 (×)
- Spaces can be inserted after the digits in the fraction part → +753.123△△△
- A number need not be placed before the decimal point → .05
- A + or − sign can be placed before the decimal point → +.05, −.05
- A number can end with a decimal point → 12.

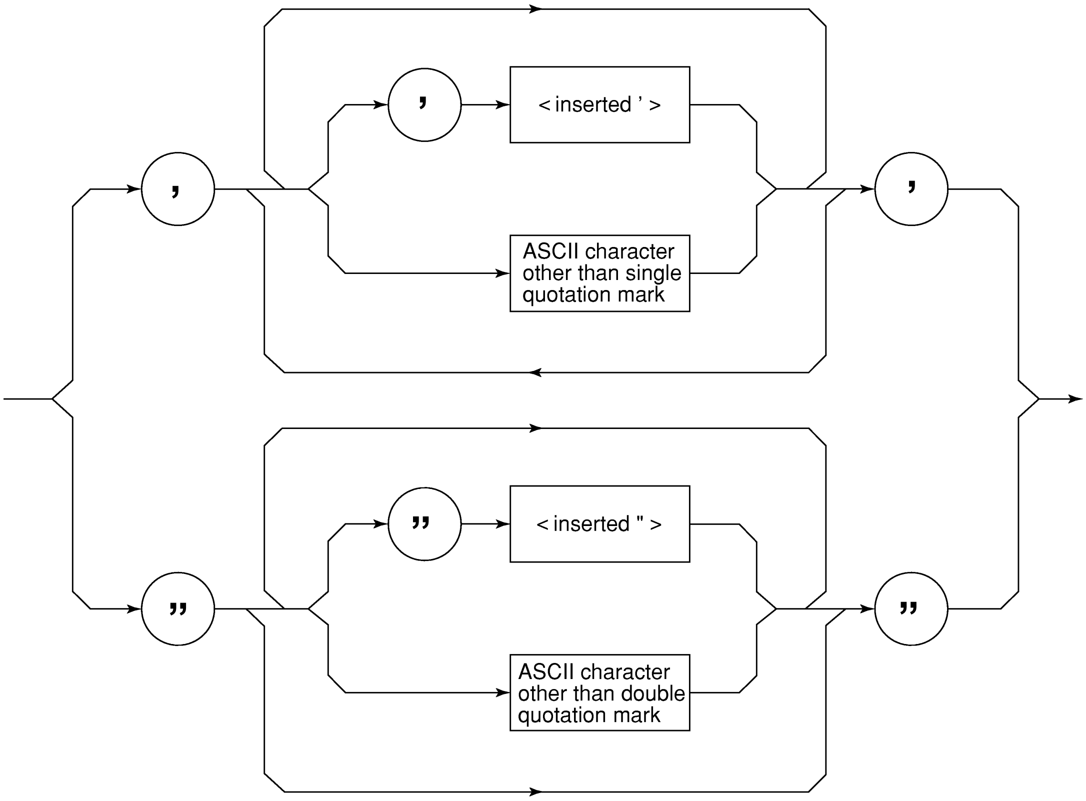
(7) SUFFIX PROGRAM DATA (unit)

The table below lists the suffixes used for MS860x/MS268x.

Table of Suffix Codes

Classification	Unit	Suffix Code
Frequency	GHz	GHZ, GZ
	MHz	MHZ, MZ
	KHz	KHZ, KZ
	Hz	HZ
	Default	HZ
Time	second	S
	m second	MS
	μ second	US
	Default	MS
Level (dB system)	dB	DB
	dBm	DBM, DM
	dBμV	DBUV
	dBmV	DBMV
	dBμV (emf)	DBUVE
	dBμV/m	DBUVM
	Default	Determined in conformance with the set scale unit
Level (V system)	V	V
	mV	MV
	μV	UV
	Default	UV
Level (W system)	W	W
	mW	MW
	μW	UW
	nW	NW
	pW	PW
	fW	FW
	Default	UW

(8) STRING PROGRAM DATA



- String program data must be enclosed with single quotation marks ('...').

    WRITE #1:"TITLE 'MS8608A'"

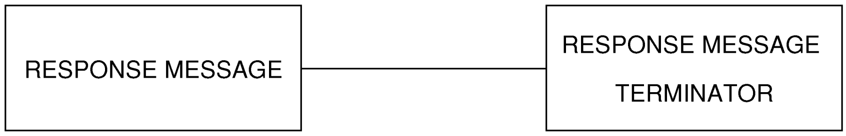
- A single quotation mark used within a character string must be repeated as shown in the double quotation marks.

    WRITE #1;"TITLE 'MS8608A''NOISE MEAS'''"

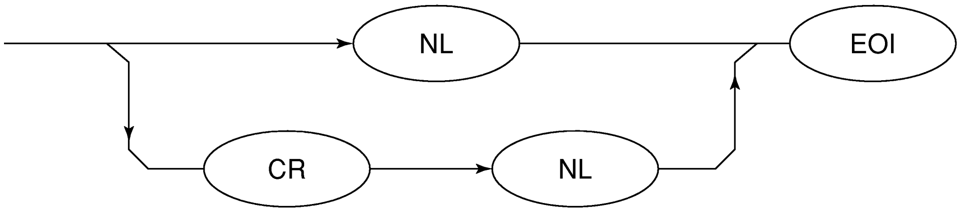
    MS8608A 'NOISE MEAS' is set as the title.

Response Message Format

To transfer the response messages from this instrument to the controller using the READ statement, the response message formats are defined as follows:

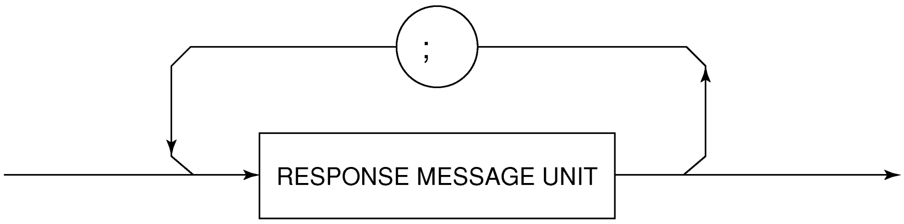


(1) RESPONSE MESSAGE TERMINATOR



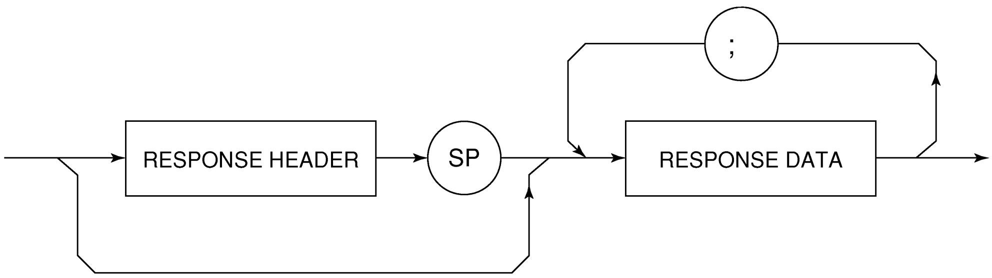
The response message or the terminator to be used depends on the TRM command specification.

(2) RESPONSE MESSAGE

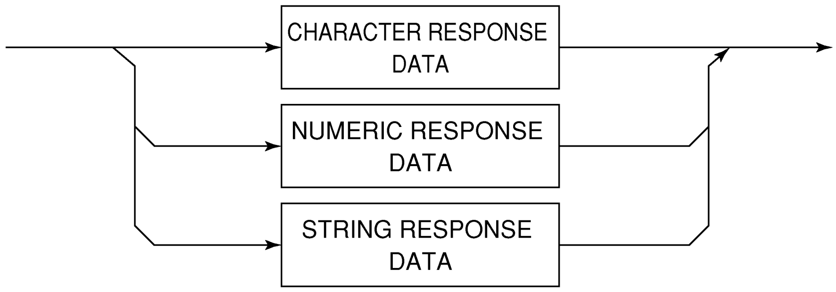


When a query is sent by the WRITE statement with one or more program queries, the response message also consists of one or more response message units.

(3) Usual RESPONSE MESSAGE UNIT



(4) RESPONSE DATA

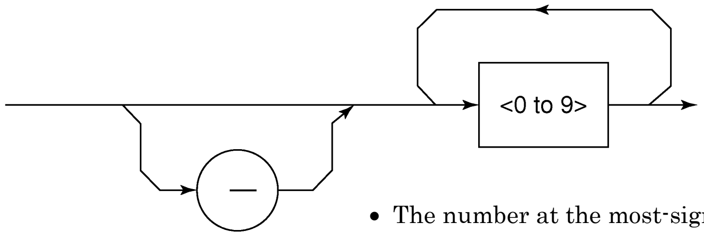


(5) CHARACTER RESPONSE DATA

Character response data is specific character string data consisting of the uppercase alphabetic characters from A to Z, lowercase alphabetic characters from a to z, numbers 0 to 9, and underline (_).

(6) NUMERIC RESPONSE DATA

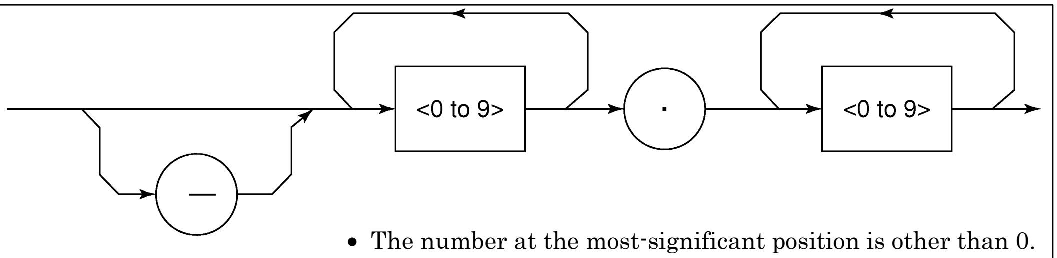
<Integer format (NR1) >



< Example >
123
−1234

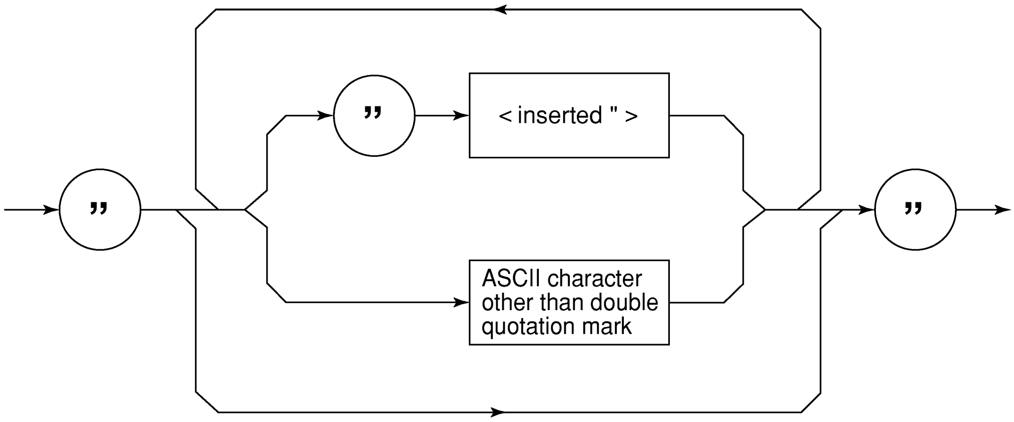
- The number at the most-significant position is other than 0.
- A + sign need not be placed before a positive number.

<Fixed-point format (NR2) >



- The number at the most-significant position is other than 0.
- A + sign need not be placed before a positive number.
- If there are zeros after the decimal point, the numeric data is transmitted in the integer format.

(7) CHARACTER RESPONSE DATA



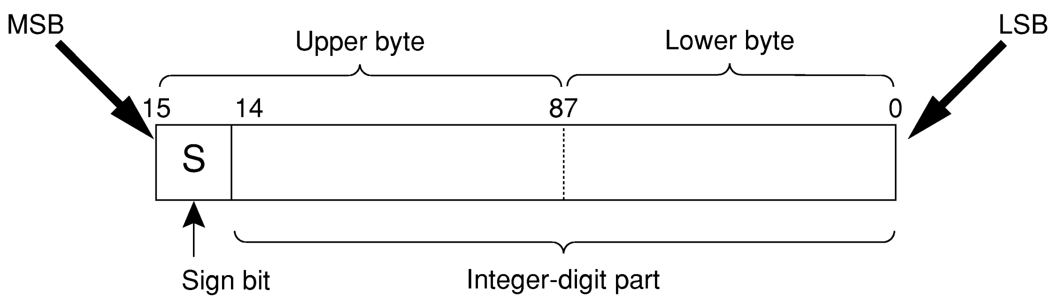
String response data is transmitted as an ASCII character enclosed with double quotation marks.

(8) Response message for input of waveform data using binary data

The waveform binary data is two-byte 65536 integer data from –32768 to 32767, as shown below; and sent in the sequence of upper byte and lower byte.

16-Bit Binary	With Sign	No sign
1000000000000000	–32768	32768
1000000000000001	–32767	32769
1000000000000010	–32766	32770
1111111111111101	–3	65533
1111111111111110	–2	65534
1111111111111111	–1	65535
0000000000000000	0	0
0000000000000001	1	1
0000000000000010	2	2
0000000000000011	3	3
0111111111111101	32765	32765
0111111111111110	32766	32766
0111111111111111	32767	32767

Sign bit: Bit 15(MBS) is used.
Integer-digit part: Bits 0 to 14 are used.
So, 16 bits(two bytes) are used.

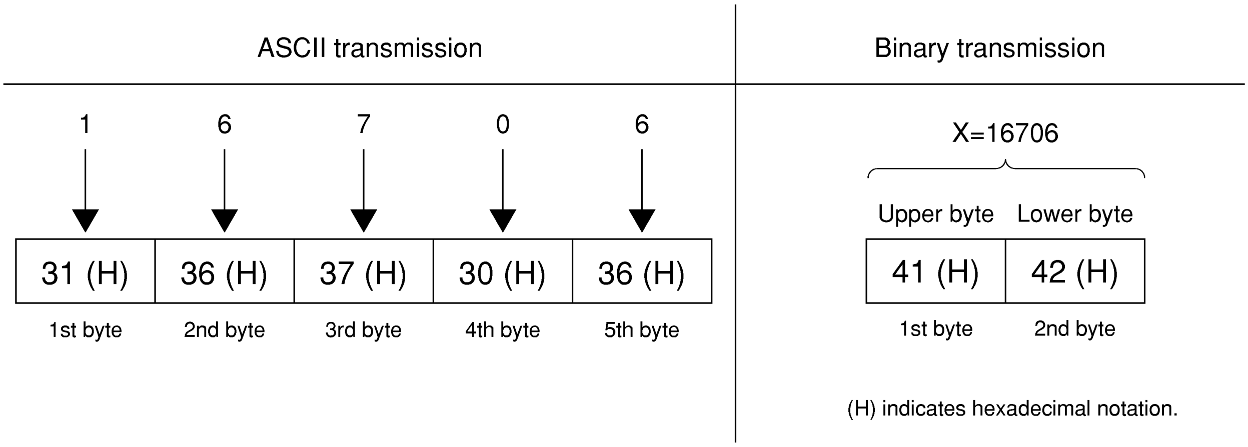


Internal Representation of 2-byte Bynary Data

† When a negative number is stored in a numeric variable, the sign bit 1 is set in the MSB to indicate the negative value.
The negative value is stored in a numeric variable in a 2's complement format.

For an example, to transmit an integer of 16706, the ASCII format is compared with the Binary format, below.

The ASCII format requires 5 bytes. Whereas, the Binary format requires only 2 bytes, and does not need the data format transformation. So, The Binary format is used for a high-speed transmission.



$$16706\ (D) = 4 \times 16^3 + 1 \times 16^2 + 4 \times 16^1 + 2 \times 16^0$$

Binary notation

	Upper byte								Lower byte							
bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X=16706	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0

1st byte → 2nd byte (Transmission order)

bit	7	6	5	4	3	2	1	0	
1st byte	0	1	0	0	0	0	0	1	(Upper byte) = 41 (H)
2nd byte	0	1	0	0	0	0	1	0	(Lower byte) = 42 (H)

The waveform binary data has a number of bytes for

(Number of points to be specified) × 2 bytes + termination code.

Where, termination code is specified by the TRM command, and is LF (0D (H): 1 byte) or CR+LF (0A0D (H): 2 bytes).

Section 4 Status Structure

This section describes the device-status reporting and its data structure defined by the IEEE488.2 when the GPIB interface bus is used. This section also describes the synchronization techniques between a controller and device.

These functions are used to control a device from an external controller using the GPIB interface bus. Most of these functions can also be used to control a device from an external controller using the RS-232C or Ethernet interface.

IEEE488.2 Standard Status Model 4-3
Status Byte (STB) Register 4-5
    ESB and MAV summary messages 4-5
    MS860x/MS268x unique summary messages.......... 4-6
    Reading and clearing the STB register 4-7
Service Request (SRQ) Enabling Operation 4-8
Standard Event Status Register.. 4-9
    Bit definition of Standard Event Status Register 4-9
    Reading, writing, and clearing the Standard Event
        Status Register 4-10
    Reading, writing, and clearing the Standard Event
        Status Enable Register................................. 4-10
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    Reading, writing, and clearing the Extended Event
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Synchronizing MS860x/MS268x with a Controller 4-14
    Wait for a response after the ∗OPC? query is sent... 4-14
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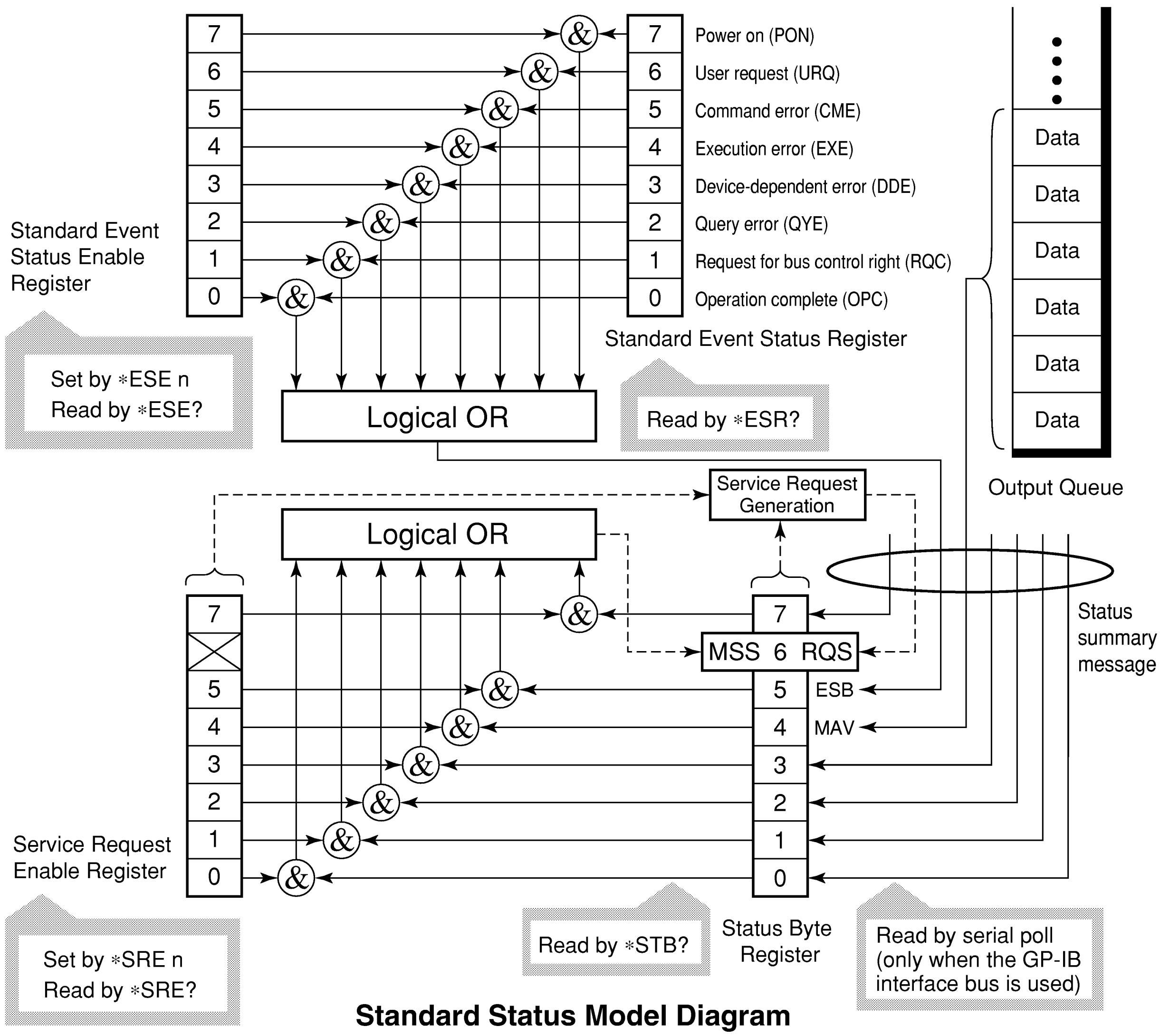
The Status Byte (STB) sent to the controller is based on the IEEE488.2 standard. The bits comprising the STB are called status summary messages because they represent a summary of the current data in registers and queues.

IEEE488.2 Standard Status Model

The diagram below shows the standard model for the status structures defined by the IEEE488.2 standard.



Standard Status Model Diagram

In the status model, IEEE488.2 status bytes are used for the lowest grade status. This status byte is composed of seven summary message bits from the higher grade status structure. To create these summary message bits, the status data structure is composed of two types of register and queue models.

Register model	Queue model
The register model consists of two registers used for recording events and conditions encountered by a device. These two registers are the Event Status Register and Event Status Enable Register. When the results of the AND operation of both register contents are other than 0, the corresponding bit of the status bit becomes 1. In other cases, the corresponding bit becomes 0. When the result of their Logical OR is 1, the summary message bit also becomes 1. If the Logical OR result is 0, the summary message bit also becomes 0.	The queue in the queue model is used to sequentially record the waiting status values or information. If the queue is not empty, the queue structure summary message becomes 1. If the queue is empty, the message becomes 0.

In IEEE488.2, there are three standard models for the status data structure. Two are register models and one is a queue model based on the register model and queue model described above. The three standard models are:

[1] Standard Event Status Register and Standard Event Status Enable Register

[2] Status Byte Register and Service Request Enable Register

[3] Output Queue

Standard Event Status Register	Status Byte Register	Output Queue
The Standard Event Status Register has the same structure as the previously described register model. In this register, the bits for eight types of standard events encountered by a device are set as follows: [1] Power on [2] User request [3] Command error [4] Execution error [5] Device-dependent error [6] Query error [7] Request for bus control right [8] Operation complete The Logical OR output bit is represented by Status Byte Register bit 5 (DIO6) as a summary message for the Event Status Bit (ESB).	The Status Byte Register is a register in which the RQS bit and the seven summary message bits from the status data structure can be set. This register is used together with the Service Request Enable Register. When the results of the OR operation of both register contents are other than 0, SRQ becomes ON. To indicate this, Status Byte Register bit 6 (DIO7) is reserved by the system as the RQS bit. The RQS bit is used to indicate that there is a service request for the external controller. The mechanism of SRQ conforms to the IEEE488.2 standard.	The Output Queue has the structure of the queue model described above. Status Byte Register bit 4 (DIO5) is set as a summary message for Message Available (MAV) to indicate that there is data in the output buffer.

Status Byte (STB) Register

The STB register consists of the STB and RQS (or MSS) messages of the device.

ESB and MAV summary messages

This paragraph describes the ESB and MAV summary messages.

(1) ESB summary message

The ESB (Event Summary Bit) summary message is a message defined by IEEE488.2 which uses bit 5 of the STB register. When the setting permits events to occur, the ESB summary message bit becomes 1 if any one of the events recorded in the Standard Event Status Register becomes 1. Conversely, the ESB summary message bit becomes 0 if one of the recorded events occurs, even if events are set to occur.

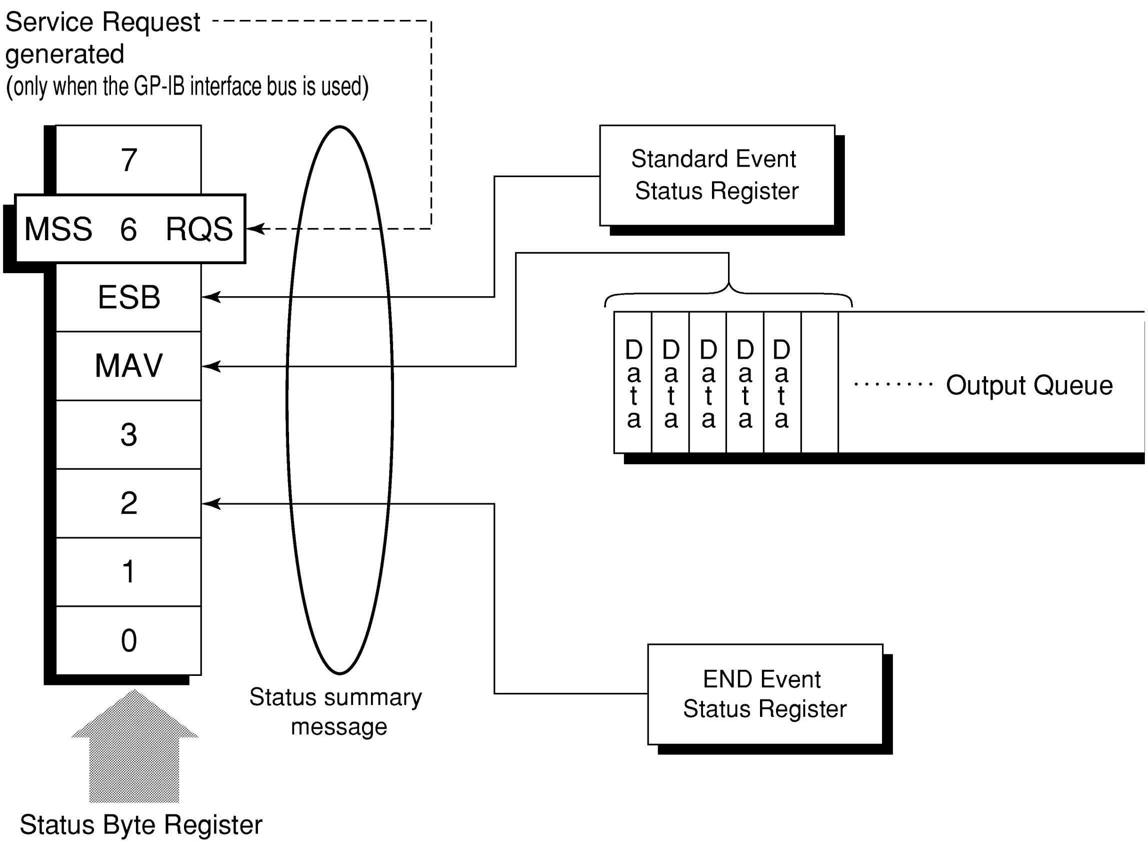
This bit becomes 0 when the ESR register is read by the *ESR? query or when it is cleared by the *CLS command.

(2) MAV summary message

The MAV (Message Available) summary messagee is a message defined by IEEE488.2 which uses bit 4 of the STB register. This bit indicates whether the output queue is empty. The MAV summary message bit is set to 1 when a device is ready to receive a request for a response message from the controller. When the output queue is empty, this bit is set to 0. This message is used to synchronize the information exchange with the controller. For example, this message is available when, after the controller sends a query command to a device, the controller waits until MAV becomes 1. While the controller is waiting for a response from the device, other jobs can be processed. Reading the Output Queue without first checking MAV will cause all system bus operations to be delayed until the device responds.

MS860x/MS268x unique summary messages

As shown in the diagram below, MS860x/MS268x does not use bit 0, 1, 3, and 7, and it uses bit 2 as the summary bit of the Event Status Register.



Reading and clearing the STB register

The STB register can be read using serial polling or the *STB? common query. The IEEE488.2 STB message can be read by either method, but the value sent to bit 6 (position) is different for each method.

The STB register contents can be cleared using the *CLS command.

(1) Reading by serial polling (only when the GPIB interface bus is used)

The IEEE488.2 serial polling allows the device to return a 7-bit status byte and an RQS message bit which conforms to IEEE488.2. The value of the status byte is not changed by serial polling. The device sets the RQS message to 0 immediately after being polled.

(2) Reading by the *STB? common query

The *STB? common query requires the devices to send the contents of the STB register and the integer format response messages, including the MSS (Master Summary Status) summary message. Therefore, except for bit 6, which represents the MSS summary message, the response to *STB? is identical to that of serial polling.

(3) Definition of MSS (Master Summary Status)

MSS indicates that there is at least one cause for a service request. The MSS message is represented at bit 6 response to an *STB? query, but it is not produced as a response to serial polling. It should not be taken as part of the status byte specified by IEEE488.1. MSS is configured by the overall logical OR in which the STB register and SRQ enable (SRE) register are combined.

(4) Clearing the STB register using the *CLS common command

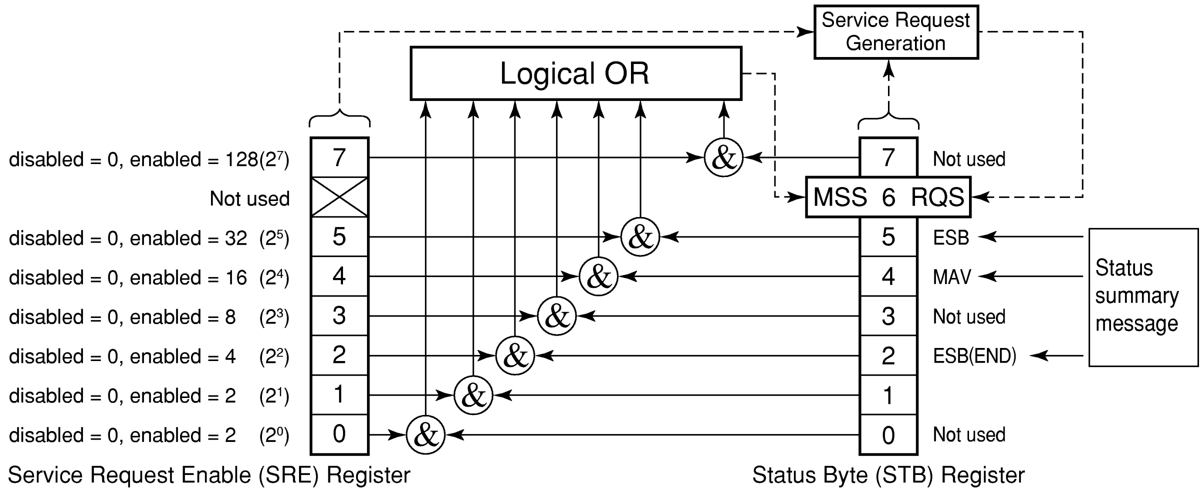
The *CLS common command clears all status data structures as well as the summary messages corresponding to them.

The *CLS command does not affect the settings in the Enable Register.

Service Request (SRQ) Enabling Operation

Bit 0 to 7 of the Service Request Enable Register (SRE) determine which bit of the corresponding STB register can generate SRQ.

The bits in the Service Request Enable Register correspond to the bits in the Status Byte Register. If a bit in the Status Byte Register corresponding to an enabled bit in the Service Request Enable Register is set to 1, the device makes a service request to the controller with the RQS bit set to 1.



(1) Reading the SRE register

The contents of the SRE register are read using the ∗SRE? common query. The response message to this query is an integer from 0 to 255 which is the sum of the bit digit weighted values in the SRE register.

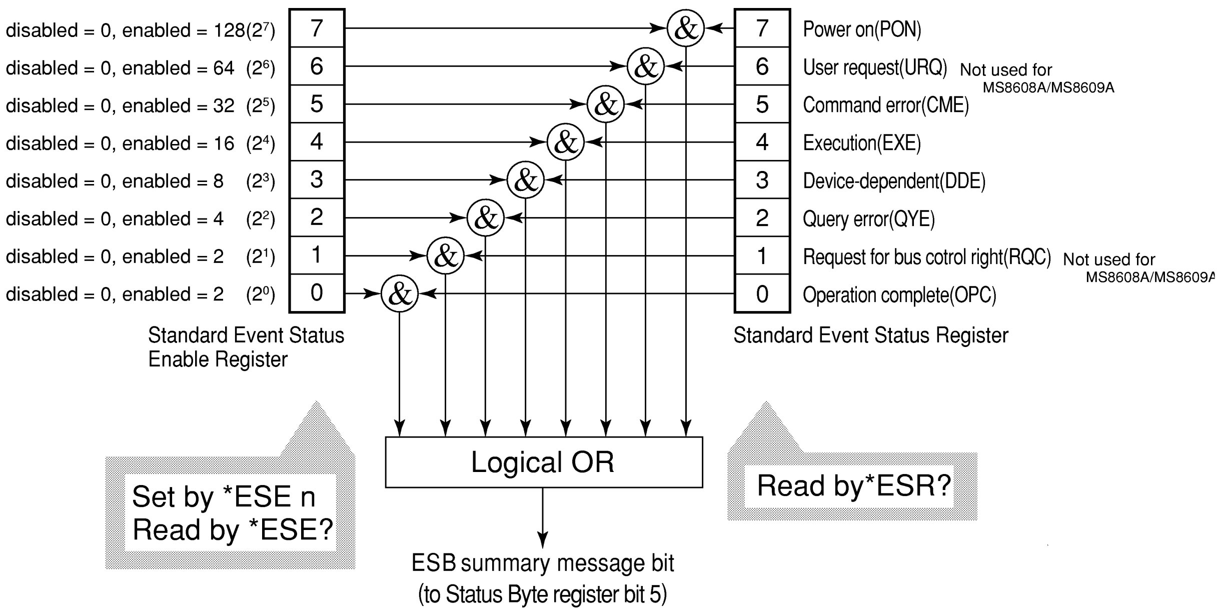
(2) Updating the SRE register

The SRE register is written using the ∗SRE common command. An integer from 0 to 255 is assigned as a parameter to set the SRE register bit to 0 or 1. The value of bit 6 is ignored.

Standard Event Status Register

Bit definition of Standard Event Status Register

The diagram below shows the operation of the Standard Event Status Register.



The Standard Event Status Enable (ESE) Register on the left is used to select which bits in the corresponding Event Register will cause a TRUE summary message when set.

Bit	Event name	Description
7	Power on (PON-Power on)	A transition from power-off to power-on occurred during the power-up procedure.
6	Not used	Not used
5	Command error (CME-Command Error)	An illegal program message or a misspelled command was received.
4	Execution error (EXE-Execution Error)	A legal but unexecutable program message was received.
3	Device-dependent error (DDE-Device-dependent Error)	An error not caused by CME, EXE, or QYE occurred (parameter error, etc.).
2	Query error (QYE-Query Error)	An attempt was made to read data in the Output Queue when it was empty. Or, the data in the Output Queue was lost before it was read.
1	Not used	Not used
0	Operation complete (OPC-Operation Complete)	This bit becomes 1 when this instrument has processed the *OPC command.

Reading, writing, and clearing the Standard Event Status Register

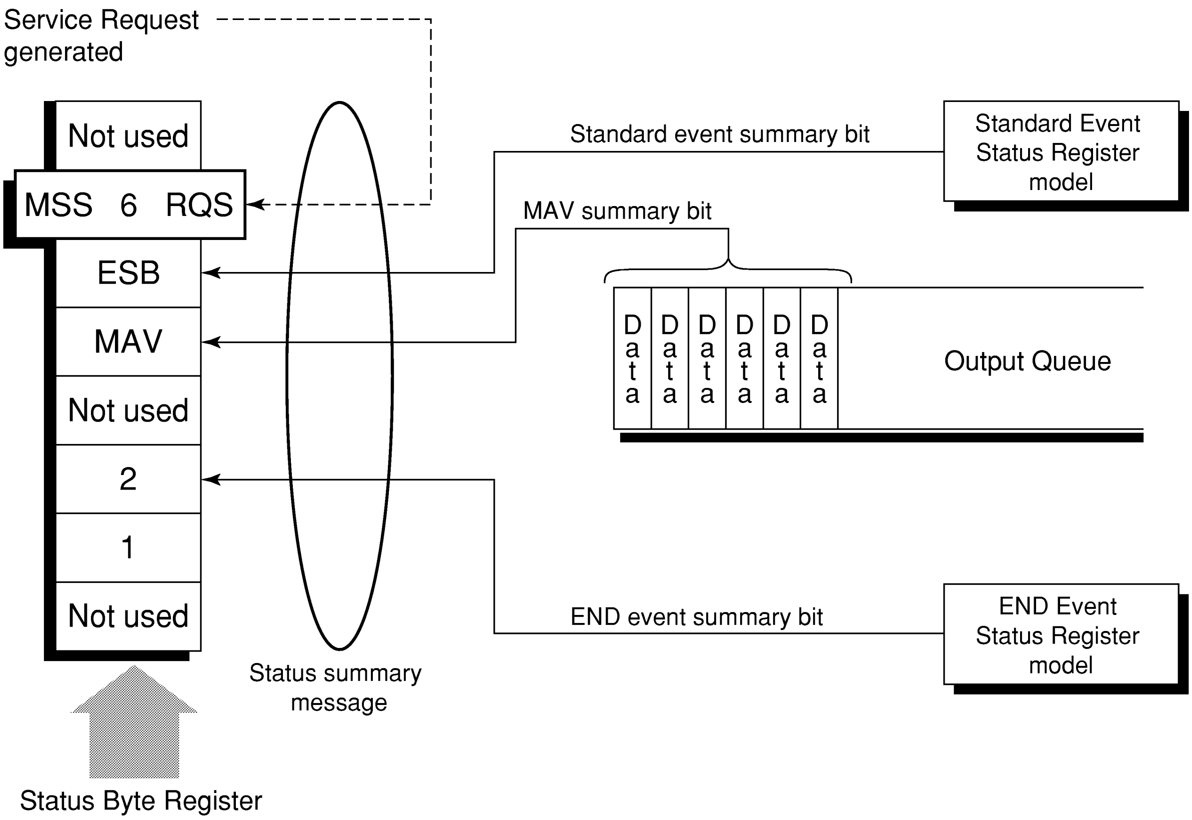
Reading	The register is read using the *ESR? common query. The register is cleared after being read. The response message is integer-format data with the binary weight added to the event bit and the sum converted to decimal.
Writing	With the exception of clearing, data cannot be written to the register from outside.
Clearing	The register is cleared when: [1] A *CLS command is received [2] The power is turned on Bit 7 is set to ON, and the other bits are cleared to 0 [3] An event is read for the *ESR? query command

Reading, writing, and clearing the Standard Event Status Enable Register

Reading	The register is read using the *ESE? common query. The response message is integer-format data with the binary weight added to the event bit and the sum converted to decimal.
Writing	The register is written using the *ESE common command.
Clearing	The register is cleared when: [1] An *ESE command with a data value of 0 is received [2] The power is turned on The Standard Event Enable Register is not affected when: [1] The device clear function status of IEEE488.1 is changed [2] An *RST common command is received [3] A *CLS common command is received

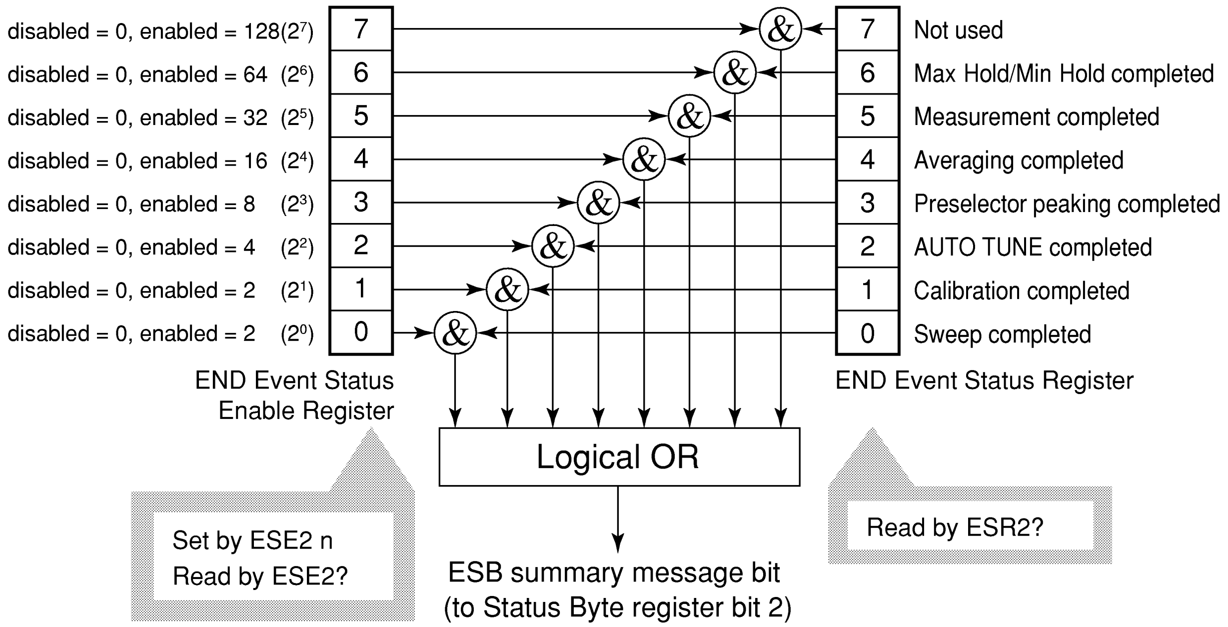
Extended Event Status Register

For MS860x/MS268x, bits 7, 3, 1, and 0 are unused. Bit 2 is assigned to the END summary bit as the status summary bit supplied by the extended register model as shown below.



Bit definition of END Event Status Register

The diagram below shows the operation and event bit names of the END Event Status Register.



The END Event Status Enable Register on the left is used to select which bits in the corresponding Event Register will cause a TRUE summary message when set.

Bit	Event name	Description
7	Not used	Not used
6	Max Hold/Min Hold	Sweeping according to the specified HOLD number has been completed.
5	Measurement completed	Calculation processing for measurements (frequency count, noise, etc.) has been completed.
4	Averaging completed	Sweeping according to the specified AVERAGE number has been completed.
3	Preselector peaking completed	Preselector peaking has been completed.
2	AUTO TUNE completed	AUTO TUNE has been completed.
1	Calibration completed	ALL CAL, LEVEL CAL, or FREQ CAL has been completed.
0	Sweep completed	A single sweep has been completed or is in standby.

Reading, writing, and clearing the Extended Event Status Register

Reading	The ESR2? common query is used to read the register. The register is cleared after being read. The response message is integer-format data with the binary weight added to the event bit and the sum converted to decimal.
Writing	With the exception of clearing, data cannot be written to the register from outside.
Clearing	The register is cleared when: [1] A *CLS command is received [2] The power is turned on [3] An event is read for the ESR2? query command

Reading, writing, and clearing the Extended Status Enable Register

Reading	The ESE2? query is used to read the register. The response message is integer-format data with the binary weight added to the event bit and the sum converted to decimals.
Writing	The ESE2 program command is used to write the register. Because bits 0 to 7 of the registers are weighted with values 1, 2, 4, 8, 16, 32, 64 and 128, respectively, the write data is transmitted as integer-format data that is the sum of the required bit digits selected from the weighted value.
Clearing	The register is cleared when: [1] An ESE2 program command with a data value of 0 is received [2] The power is turned on The Extended Event Status Enable register is not affected when: [1] The device clear function status of IEEE488.1 is changed [2] An *RST common command is received [3] A *CLS common command is received

Synchronizing MS860x/MS268x with a Controller

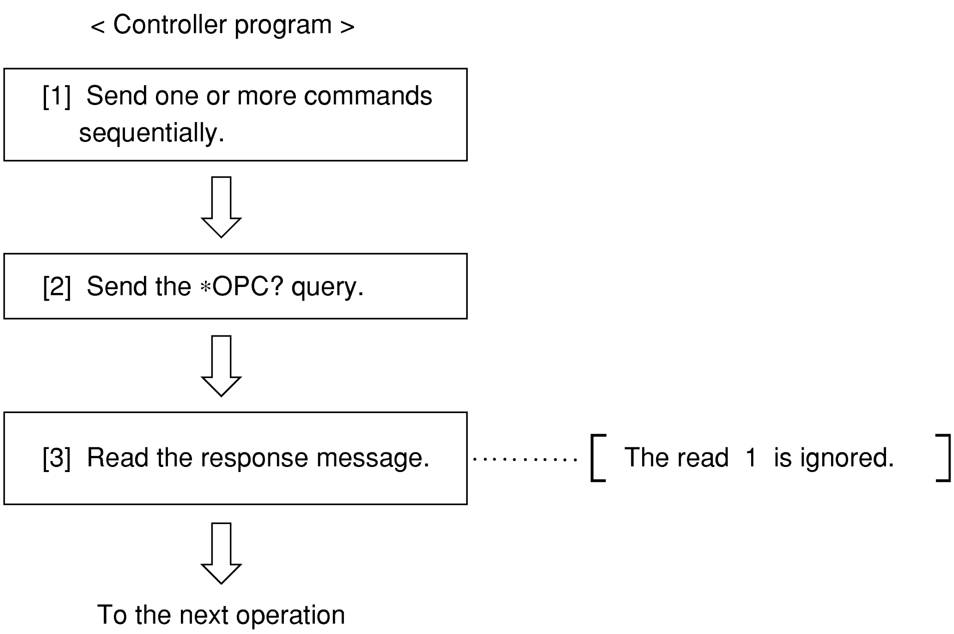
MS860x/MS268x usually treats program messages as sequential commands that do not process newly-received commands until they complete the processing of the previous command. Therefore, no special consideration is necessary for pair-synchronization between MS860x/MS268x and the controller.

If the controller controls and synchronizes with one or more devices, after all the commands specified for MS860x/MS268x have been processed, the next commands must be sent to other devices.

There are two ways of synchronizing MS860x/MS268x with the controller:
[1] Wait for a response after the ∗OPC? query is sent.
[2] Wait for SRQ after ∗OPC is sent.

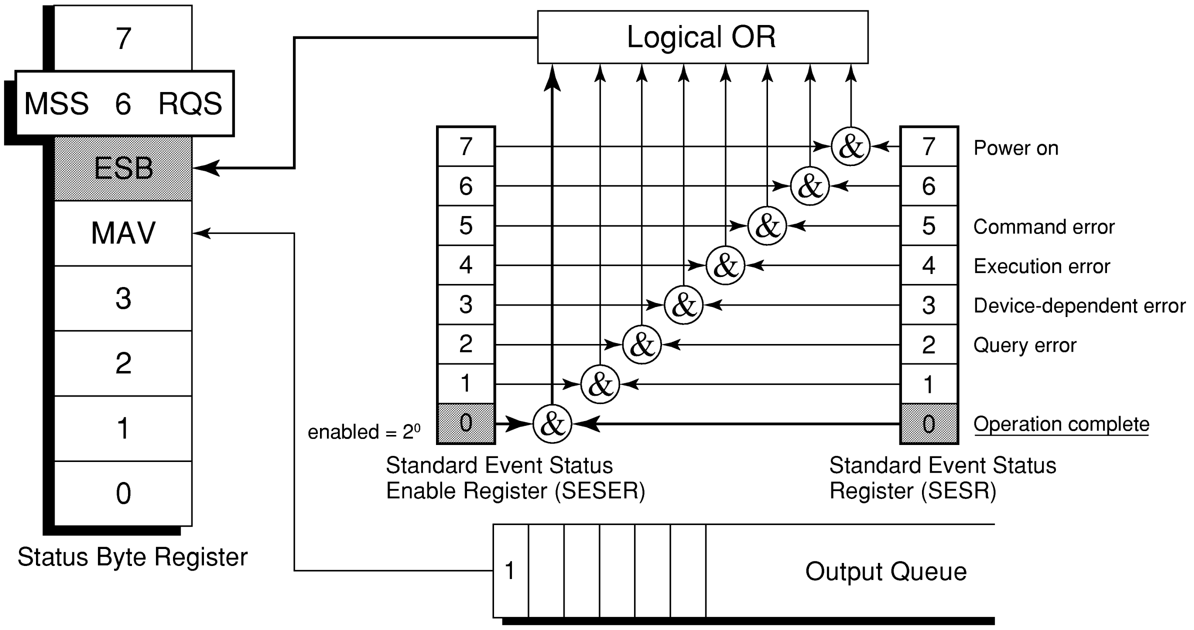
Wait for a response after the ∗OPC? query is sent.

MS860x/MS268x outputs "1" as the response message when executing the ∗OPC? query command. The controller is synchronized with MS860x/MS268x by waiting for the response message to be entered.



Wait for a service request after ∗OPC is sent (only when the GPIB interface bus is used).

MS860x/MS268x sets the operation complete bit (bit 0) to 1 when executing the ∗OPC command. The controller is synchronized with MS860x/MS268x for SRQ when the operation complete bit is set for SRQ.



■ < Controller program >

[1] Enable the 2^0 bit of the Standard Event Status Enable Register.	`PRINT @1;"*ESE 1"`
⇩	
[2] Enable the 2^5 bit of the Service Request Enable Register.	`PRINT @1;"*SRE 32"`
⇩	
[3] Make the device execute the specified operation.	
⇩	
[4] Send the ∗OPC command.	`PRINT @1;"*OPC"`
⇩	
[5] Wait for the SRQ interrupt (ESB summary message).	···Value of status byte: $2^6 + 2^5 = 96$

Section 5 Initial Settings

MS860x/MS268x initializes at three levels in accordance with the IEEE488.2 specifications. This section describes how these three levels of initialization are processed, and how to instruct initialization from the controller.

Bus Initialization Using IFC Statement................................ 5-4
Initialization for Message Exchange by DCL and
SDC Bus Commands.. 5-5
Device Initialization Using ∗RST Command 5-7
Device Initialization Using INI/IP Command 5-8
Device Status at Power-on 5-8

In the IEEE488.2 standard, there are three levels of initialization. The first level is “bus initialization,” the second level is “initialization for message exchange,” and the third level is “device initialization.” This standard also stipulates that a device must be set to a known state when the power is turned on.

Level	Initialization type	Description	Level combination and sequence
1	Bus initialization	The IFC message from the controller initializes all interface functions connected to the bus.	Level 1 can be combined with other levels, but must be executed before level 2.
2	Initialization for message exchange	Message exchanges of all devices and specified devices on the GPIB are initialized using the SDC and DCL GPIB bus commands, respectively. These commands also nullify the function that reports operation completion to the controller.	Level 2 can be combined with other levels, but must be executed before level 3.
3	Device initialization	The *RST or INI/IP command returns a specified device to a known device-specific state, regardless of the conditions under which it was being used.	Level 3 can be combined with other levels, but must be executed after levels 1 and 2.

When using the RS-232C (Standard)/Ethernet (Option) interface port to control the MS860x/MS268x from the controller, the level 3 “device initialization” function of can be used, and the level 1, 2 initialization function cannot be used. When using the GPIB (Standard) interface bus to control the MS860x/MS268x from the controller, the initialization functions of levels 1, 2, and 3 can be used.

The following paragraph describes the commands for initialization at levels 1, 2, and 3 and the items that are initialized. This paragraph also describes the known state that is set when the power is turned on.

Bus Initialization Using IFC Statement

■ Example

```
board% = 0
CALL SendIFC (board%)
```

■ Explanation

This function can be using when using the GPIB interface bus is used to control MS860x/MS268x from the controller.
The IFC statement initializes the interface functions of all devices connected to the GPIB bus line.
The initialization of interface functions involves clearing the interface function states of devices set by the controller, and resetting them to their initial states. In the table below, ○ indicates the functions that are initialized, and △ indicates the functions that are partially initialized.

No	Function	Symbol	Initialization by IFC
1	Source handshake	SH	○
2	Acceptor handshake	AH	○
3	Talker or extended talker	T or TE	○
4	Listener or extended listener	L or LT	○
5	Service request	SR	△
6	Remort/local	RL	
7	Pallel poll	PP	
8	Device clear	DC	
9	Device trigger	DT	
10	Controller	C	○

Bus initialization by the IFC statement does not affect the device operating state (frequency settings, LED on/off, etc.).

Initialization for Message Exchange by DCL and SDC Bus Commands

■ Example

Initializes all devices on the bus for message exchange (sending DCL).

```
board% = 0
addresslist% = NOADDR
CALL DevClearList(board%, addresslist%)
```

Initializes only the device at address 3 for message exchange (sending SDC).

```
board% = 0
address% = 3
CALL DevClear (board%, address%)
```

■ Explanation

This function is available when the GPIB interface is used to control MS860x/MS268x from the controller.

This statement executes initialization for message exchange of all devices or a specified device on the GPIB having the specified select code.

■ Items to be initialized for message exchange

When MS860x/MS268x accepts the DCL or SDC bus command, it does the following:

[1]	Input buffer and Output Queue:	Clears them and also clears the MAV bit.
[2]	Parser, Execution Controller, and Response Formatter:	Resets them.
[3]	Device commands including ∗RST:	Clears all commands that prevent these commands from being executed.
[4]	Processing of the ∗OPC command:	Puts a device in OCIS (Operation Complete Command Idle State). As a result, the operation complete bit cannot be set in the Standard Event Status Register.
[5]	Processing of the ∗OPC? query:	Puts a device in OQIS (Operation Complete Query Idle State). As a result, the operation complete bit 1 cannot be set in the Output Queue.
[6]	Device functions:	Puts all functions associated with message exchange in the idle state. The device continues to wait for a message from the controller.

CAUTION ⚠

The following are not affected even if the DCL and SDC commands are processed.

[1] Current data set or stored in the device
[2] Status of front panel
[3] Status of status byte other than MAV bit
[4] A device operation in progress

Device Initialization Using ∗RST Command

■ Syntax

```
*RST
```

■ Example

For RS-232C/Ethernet

`WRITE #1,"*RST"` ....Initializes MS860x/MS268x at address 1 at level 3.

For GPIB

```
SPA%=1
CALL Send(0,SPA,"*RST",NLend)
```

■ Explanation

The ∗RST (Reset) command is an IEEE488.2 common command that resets a device at level 3.
The ∗RST (Reset) command is used to reset a device (MS860x/MS268x) to a specific initial state.

Note:

The ∗RST command does not affect the following.

[1] IEEE488.1 interface state
[2] Device address
[3] Output Queue
[4] Service Request Enable register
[5] Standard Event Status Enable register
[6] Power-on-status-clear flag setting
[7] Calibration data affecting device specifications
[8] Parameters preset for control of external device, etc.

Device Initialization Using INI/IP Command

■ Syntax

```
INI
IP
```

■ Example (program message)

For RS-232C/Ethernet

`WRITE #1,"INI"` ....Initializes the device (spectrum analyzer function) at address 1 at level 3.

For GPIB

```
SPA%=1
CALL Send(0,SPA%,"INI",NLend)
```

■ Explanation

The INI and IP commands are MS860x/MS268x device-dependent messages that initialize a device at level 3.

Device Status at Power-on

When the power is turned on:

[1] The device is set to the status it was in at power-off.

[2] The Input Buffer and Output Queue are cleared.

[3] The Parser, Execution Controller, and Response Formatter are initialized.

[4] The device is put into OCIS (Operation Complete Command Idle State).

[5] The device is put into OQIS (Operation Complete Query Idle State).

[6] The Standard Event Status Resister and the Standard Event Status Enable Register are cleared. Events can be recorded after the registers have been cleared.

Section 6 Command List

This section lists the external control commands to be used by W-CDMA Measurement Software.

This list of commands is described for each measurement screen of the MS860x Digital Mobile Ratio Transmitter Tester/MS268x Spectrum Analyzer.

See Section 7 “Detailed Explanations of Commands,” for the details of each command.

List of Commands on Each Measurement Screen 6-3
Commands Commonly Used on All Measurement Screens................. 6-4
Setup Common Parameter 6-8
Modulation Analysis 6-11
Transmitter Power 6-22
Occupied Bandwidth 6-28
Adjacent Channel Power... 6-30
Spurious Emission... 6-35
Power Meter 6-42
IQ Level 6-43
Demodulation Data.. 6-44
Spectrum Emission Mask.. 6-49
CCDF 6-52

List of Commands on Each Measurement Screen

The following pages show a list of commands (device messages) for each item on W-CDMA Software Measurement screen.

■ Meanings of device message character strings

(a) Uppercase character: Reserved word

(b) Numeric value: Reserved word (Numerical code)

(c) Lowercase character: Parameter (Argument)

Parameter	Meaning	Value/Form	Unit/Suffix code
f	frequency	Real or integer number with a decimal point	GHZ, MHZ, KHZ, HZ, GZ, MZ, KZ, When omitted: HZ
t	time	Real or integer number with a decimal point	S, SC, MS, US, None : MS
l	level	Real or integer number with a decimal point	DB, DBM, DM, DBMV, DBUV, DBUVE, V, MV, UV, W, MW, UW, NW, When omitted : (default unit)
n	Integer number with no unit, or integer number with a specified unit	Decimal integer	None or specified
o	Integer number with no unit	Octal integer	None
h	Integer number with no unit	Hexadecimal integer	None
r	Integer number with no unit, or integer number with a specified unit	Real number	None or specified
j	Numeric value judgment	PASS (Passable)/ FAIL (Outside the specified range)	None
s	Binary judgment	ON/OFF	None
u	Unit specification	DB, DBM, DM, DBMV, DBUV, DBUVE, V, MV, UV, W, MW, UW, NW	None

Commands Commonly Used on All Measurement Screens

This section lists the commands used on all the measurement screens for W-CDMA Software Measurement.

For more information on external control commands commonly used in all the measurement modes for the MS860x/MS268x, See the separate MS860x/MS268x operation manual.

Measurement mode switching

Function	Item	Program Message	Query Message	Response Message	Remarks
Spectrum Analyzer		PNLMD SPECT	PNLMD?	SPECT	
Tx Tester		PNLMD SYSTEM		SYSTEM	
Config		PNLMD CONFIG		CONFIG	

Measurement system switching

Function	Item	Program Message	Query Message	Response Message	Remarks
System - 1 (F1)		SYS 1	SYS?	1	
System - 2 (F2)		SYS 2		2	
System - 3 (F3)		SYS 3		3	

Output data format

Function	Item	Program Message	Query Message	Response Message	Remarks
Binary code		BIN ON	BIN?	ON	
		BIN 1			
ASCII character string		BIN OFF		OFF	
		BIN 0			

Input connector switching

Function	Item	Program Message	Query Message	Response Message	Remarks
High		RFINPUT HIGH	RFINPUT?	HIGH	*1
Low		RFINPUT LOW		LOW	

*1 Valid only when this unit is MS8608A

Initialization

Function	Item	Program Message	Query Message	Response Message	Remarks
Preset		PRE	—	—	
		INI	—	—	
		IP	—	—	

Measurement screen switching

Function	Item	Program Message	Query Message	Response Message	Remarks
Setup Common Parameter		DSPL SETCOM	DSPL?	SETCOM	
Modulation Analysis		DSPL MODANAL		MODANAL	
Transmitter Power	Filtered Power & Tx Power	DSPL RFPWR, FILTER		RFPWR,FILTER	
	Filterd Power	DSPL RFPWR, RRCFILTER		RFPWR,RRCFILTER	
	Tx Power	DSPL RFPWR, NONFILTER		RFPWR,NONFILTER	
	TPC	DSPL RFPWR, TPC		RFPWR,TPC	
	RACH	DSPL RFPWR, RACH		RFPWR,RACH	*1
	Setup TPC	DSPL SETTPC		SETTPC	
	Setup TPC2	DSPL SETTPC2		SETTPC2	*1
Occupied Bandwidth	Spectrum	DSPL OBW,SPECT		OBW,SPECT	
	FFT	DSPL OBW,FFT		OBW,FFT	
		DSPL OBW,HIGH			
Adjacent Channel Power	Spectrum (All)	DSPL ADJ,SPECT		ADJ,SPECT1	
		DSPL ADJ,SPECT1			
	Spectrum (Separate)	DSPL ADJ,SPECT2		ADJ,SPECT2	
	Modulation	DSPL ADJ,MOD		ADJ,MOD	
Spurious Emission	Spot	DSPL SPURIOUS,SPOT		SPURIOUS,SPOT	
	Search	DSPL SPURIOUS,SEARCH		SPURIOUS,SEARCH	
	Sweep	DSPL SPURIOUS,SWEEP		SPURIOUS,SWEEP	
	Setup Frequency Table: Spot	DSPL SETTBL_SPU, SPOT		SETTBL_SPU,SPOT	
	Setup Frequency Table: Search & Sweep	DSPL SETTBL_SPU, SWEEP		SETTBL_SPU,SWEEP	
Spectrum Emission Mask	Spectrum Emission Mask	DSPL SMASK		SMASK	
	Setup Spectrum Emission Mask Template	DSPL SETTEMP_SMASK		SETTEMP_SMASK	
CCDF	CCDF	DSPL CCDF,CCDF		CCDF,CCDF	*1
	APD	DSPL CCDF,APD		CCDF,APD	
Power Meter		DSPL PWRMTR		PWRMTR	*2
IQ Level		DSPL IQLVL		IQLVL	*3
Demodulation Data		DSPL DEMOD		DEMOD	
Back Screen		BS	---	---	

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: For MS268x, this command is available when Option-17 or -18 is installed.

Measurement error reading

Function	Item	Program Message	Query Message	Response Message	Remarks
Normal		—	MSTAT?	0	
RF Level Limit		—		1	
Level Over		—		2	
Level Under		—		3	
Signal Abnormal		—		4	
No Synchronization		—		5	
Trigger Timeout		—		6	
No Measure		—		9	

Measurement start

Function	Item	Program Message	Query Message	Response Message	Remarks
Single	No Sync	SNGLS	—	—	
		S2	—	—	
	Sync	SWP	—	—	
		TS	—	—	
Continuous	No Sync	CONTS	—	—	
		S1	—	—	
Measurement status	END	—	SWP?	SWP 0	
	Measuring	—		SWP 1	

Measurement screen switching + Measurement starting

Function	Item	Program Message	Query Message	Response Message	Remarks
Setup Common Parameter		MEAS SETCOM	MEAS?	SETCOM	
Modulation Analysis		MEAS MODANAL		MODANAL	
Transmitter Power	Filtered Power & Tx Power	MEAS RFPWR,FILTER		RFPWR,FILTER	
	Filtered Power	MEAS RFPWR,RRCFILTER		RFPWR,RRCFILTER	
	Tx Power	MEAS RFPWR,NONFILTER		RFPWR,NONFILTER	
	TPC	MEAS RFPWR,TPC		RFPWR,TPC	
	RACH	MEAS RFPWR,RACH		RFPWR,RACH	*1
	Setup TPC	MEAS SETTPC		SETTPC	
	Setup TPC2	MEAS SETTPC2		SETTPC2	*1
Occupied Bandwidth	Spectrum	MEAS OBW,SPECT		OBW,SPECT	
	FFT	MEAS OBW,FFT		OBW,FFT	
		MEAS OBW,HIGH			
Adjacent Channel Power	Spectrum (All)	MEAS ADJ,SPECT		ADJ,SPECT1	
		MEAS ADJ,SPECT1			
	Spectrum (Separate)	MEAS ADJ,SPECT2		ADJ,SPECT2	
	Modulation	MEAS ADJ,MOD		ADJ,MOD	

Measurement screen switching + Measurement starting

Function	Item		Program Message	Query Message	Response Message	Remarks
Spurious Emissions	Spot		MEAS SPURIOUS,SPOT	MEAS?	SPURIOUS,SPOT	
	Search		MEAS SPURIOUS,SEARCH		SPURIOUS,SEARCH	
	Sweep		MEAS SPURIOUS,SWEEP		SPURIOUS,SWEEP	
	Setup Frequency Table	Spot	MEAS SETTBL_SPU,SPOT		SETTBL_SPU,SPOT	
		Search & Sweep	MEAS SETTBL_SPU,SWEEP		SETTBL_SPU,SWEEP	
Spectrum Emission Mask	Spectrum Emission Mask		MEAS SMASK		SMASK	
	Setup Spectrum Emission Mask Template		MEAS SETTEMP_SMASK		SETTEMP_SMASK	
CCDF	CCDF		MEAS CCDF,CCDF		CCDF,CCDF	*1
	APD		MEAS CCDF,APD		CCDF,APD	
Power Meter			MEAS PWRMTR		PWRMTR	*2
IQ Level			MEAS IQLVL		IQLVL	*3
Demodulation Data			MEAS DEMOD		DEMOD	

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: For MS268x, this command is available when Option-17 or -18 is installed.

Pre Ampl (Option 08)

Function	Item	Program Message	Query Message	Response Message	Remarks
On		PREAMP ON	PREAMP?	ON	*1
Off		PREAMP OFF		OFF	

*1: This Command is available when main unit option MS2681A-08/MS2683A-08 is installed

Correction

Function	Item	Program Message	Query Message	Response Message	Remarks
Off		CORR 0	CORR?	0	
Table 1		CORR 1		1	
Table 2		CORR 2		2	
Table 3		CORR 3		3	
Table 4		CORR 4		4	
Table 5		CORR 5		5	

Setup Common Parameter

The list below shows the correspondence between the external control commands and the setting items on the Setup Common Parameter screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Terminal	RF	TERM RF	TERM?	RF	
	IQ-DC	TERM IQDC		IQDC	*1
	IQ-AC	TERM IQAC		IQAC	*1
	IQ-Balance	TERM IQBAL		IQBAL	*1
Impedance	50 Ω	IQINZ 50	IQINZ?	50	*1
	1 MΩ	IQINZ 1M		1M	
Spectrum		SPREV ON	SPREV?	ON	*2
		SPRLV OFF		OFF	
Reference Level		RFLVL l	RFLVL?	l	l: <High> (-10+offset) to (42+offset) dBm <Low> (-30+offset) to (22+offset) dBm
Reference Level Offset		RFLVLOFS l	RFLVLOFS?	l	l: -99.99 to +99.99 dB
Channel		CHAN n	CHAN?	n	n: 1 to 20000
Frequency		FREQ f	FREQ?	f	f: (MS8608A) 100 Hz to 7.8 GHz (MS8609A) 100 Hz to 13.2 GHz (MS2681A) 100 Hz to 3.0 GHz (MS2683A) 100 Hz to 7.8 GHz (MS2687A/B) 100 Hz to 30 GHz
Channel & Frequency		CHFREQ n,f	—	—	n: 1 to 20000 f: (MS8608A) 100 Hz to 7.8 GHz (MS8609A) 100 Hz to 13.2 GHz (MS2681A) 100 Hz to 3.0 GHz (MS2683A) 100 Hz to 7.8 GHz (MS2687A/B) 100 Hz to 30 GHz
Channel Spacing		CHSPC f	CHSPC?	f	f: -10.0 to 10.0 GHz

*1: For MS268x, this command is available when Option-17 or -18 is installed.

*2: Available only for MX860x01B/MX268x01B.

Setup Common Parameter (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Measuring Object	Up Link		MEASOBJ UPLNK	MEASOBJ?	UPLNK	
	Up Link (RACH)		MEASOBJ UPLNKRACH		UPLNKRACH	*1
	Down Link		MEASOBJ DNLNK		DNLNK	
	Down Link (Compress)		MEASOBJ DNLNKCOMP		DNLNKCOMP	*1
	QPSK		MEASOBJ QPSK		QPSK	
Filter	No Filter		FILTER OFF	FILTER?	OFF	
	Filtering		FILTER ON		ON	
Scrambling Code Sync.	Up Link	Long	UPCODESYNC LONG	UPCODESYNC?	LONG	
		Short	UPCODESYNC SHORT		SHORT	
	Down Link	Auto	CODESYNC AUTO	CODESYNC?	AUTO	
		Set	CODESYNC SET		SET	
Scrambling Code Number			CODENO h	CODENO?	h	h: <Up Link> 000000 to FFFFFF <Down Link> 00000 to 3FFFF
Scrambling Code Number (RACH)			CODENORACH h	CODENORACH?	h	h: 0000 to 1FFF *1
Spreading Factor Mode	Up Link	DPCCH	SFMD DPCCH	SFMD?	DPCCH	
		Set	SFMD SET		SET	
	Down Link	P-CPICH	SFMD PCPICH		PCPICH	
		Set	SFMD SET		SET	
Spreading Factor			SF n	SF?	n	n:512(Down Link Only), 256,128,64,32.16.8,4
Channelization Code Nunber			SCNO n	SCNO?	n	n:0 to (Spreading Factor−1)
Spreading Factor for DPDCH			SFDPDCH n	SFDPDCH?	n	n:256,128,64,32,16,8,4
Slot Format for DPCCH			SLTFORM n	SLTFORM?	n	n:0 to 5 *1
Spreading Factor for DPCH			SFDPCH n	SFDPCH?	n	n:512,256,128,64,32,16, 8,4

*1: Available only for MX860x01B/MX268x01B.

Setup Common Parameter (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Trigger	Free Run	TRG FREE	TRG?	FREE	
	External	TRG EXT	TRG?	EXT	
	Wide IF	TRG WIDEVID	TRG?	WIDEVID	*1
Trigger Edge	Rise	TRGEDGE RISE	TRGEDGE?	RISE	
	Fall	TRGEDGE FALL	TRGEDGE?	FALL	
Trigger Delay		TRGDLY r	TRGDLY?	r	r: -384000.0 to 384000.0 chip
Trigger Level	High	TRGLVL HIGH	TRGLVL?	HIGH	*1
	Middle	TRGLVL MIDDLE	TRGLVL?	MIDDLE	
	Low	TRGLVL LOW	TRGLVL?	LOW	

*1: Available only MX860x01B/MX268x01B.

Modulation Analysis

The list below shows the correspondence between the external control commands and the reading of the setting items and measured results on the Modulation Analysis screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Trace Format	None	TRFORM NON	TRFORM?	NON	
	Constellation	TRFORM CONSTEL		CONSTEL	
	Eye Diagram	TRFORM EYE		EYE	
	EVM	TRFORM VECT		VECT	
	Phase Error	TRFORM PHASE		PHASE	
	Magnitude Error	TRFORM MAGTD		MAGTD	
	Code Domain	TRFORM CORD		CORD	
	Code vs Time	TRFORM CDVSTM		CDVSTM	*1
Operation Phase	I	OPRTP I	OPRTP?	I	
	Q	OPRTP Q		Q	
Code Domain Display	Power	CDDSPL PWR	CDDSPL?	PWR	
	Error	CDDSPL ERR		ERR	
Storage Mode	Normal	STRG_MOD NRM	STRG_MOD?	NRM	
	Average	STRG_MOD AVG		AVG	
	Overwrite	STRG_MOD OVER		OVER	
Average Count		AVR_MOD n	AVR_MOD?	n	n:2 to 9999
Refresh Interval	Every	INTVAL_MOD EVERY	INTVAL_MOD?	EVERY	
	Once	INTVAL_MOD ONCE		ONCE	
Average Mode	Normal	AVGMD_MOD NRM	AVGMD_MOD?	NRM	*1
	Continuous	AVGMD_MOD CONTS		CONTS	
Peak Hold	On	PHOLD_MOD ON	PHOLD_MOD?	ON	*1
	Off	PHOLD_MOD OFF		OFF	
Continuous Avg. Length		CONTAVGLENGTH a	CONTAVGLENGTH?	a	a: 15 to 150 *1
Interpolation	Non	INTPOL NON	INTPOL?	NON	
	Linear	INTPOL LIN		LIN	
	10points	INTPOL POINT 10		POINT10	
	Linear & Symbol Position	INTPOL LINSYM		LINSYM	
	10 points & Symbol Position	INTPOL P10SYM		P10SYM	
Error Scale	5 %	ERRSC 5	ERRSC?	5	
	10 %	ERRSC 10		10	
	20 %	ERRSC 20		20	
	OFF	ERRSC OFF		OFF	
Phase Offset	0°	SCOFS 0	SCOFS?	0	
	45°	SCOFS 45		45	

*1: Available only for MX860x01B/MX268x01B

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Vertical Scale (EVM, Phase Error, Magnitude Error)	5 % or 5 deg	VSCALE 5	VSCALE?	5	
	10 % or 10 deg	VSCALE 10		10	
	20 % or 20 deg	VSCALE 20		20	
	50 % or 50 deg	VSCALE 50		50	
	100 % or 100 deg	VSCALE 100		100	
Vertical Scale (Code Domain Power)	20 dB	VSCALE_CDP 20	VSCALE_CDP?	20	*1
	40 dB	VSCALE_CDP 40		40	
	60 dB	VSCALE_CDP 60		60	*1
	80 dB	VSCALE_CDP 80		80	
Virtical Scale (Code vs Time)	20 dB	VSCALE_CVT 20	VSCALE_CVT?	20	*1
	40 dB	VSCALE_CVT 40		40	
	60 dB	VSCALE_CVT 60		60	
	80 dB	VSCALE_CVT 80		80	
Square Scale	1	SSCALE 1	SSCALE?	1	*1
	2	SSCALE 2		2	
	5	SSCALE 5		5	
	10	SSCALE 10		10	
Analysis Start		ANLYSTA n	ANLYSTA?	n	n: 0 to 38400 chip
Analysis Length		ANLYLEN n	ANLYLEN?	n	n: <Up Link> 256/512 to 2560 chip <Down Link> 256/512 to 2560 chip <QPSK> 4 to 2560 chip
Max Spreading Factor	256	MAXSF 256	MAXSF?	256	
	512	MAXSF 512	MAXSF?	512	
Exclude EVM Origin Offset	On	EXEVMORGOFST ON	EXEVMORGOFST?	ON	*1
	Off	EXEVMORGOFST OFF		OFF	
Threshold		THRESH_MOD l	THRESH_MOD?	l	l: -50.0 to –10.0 dB *1
Threshold	Auto	THRESHMD_MOD AUTO	THRESHMD_MOD	AUTO	*1
	Manual	THRESHMD_MOD MANUAL		MANUAL	
Spreading Factor		SF_CDP n	SF_CDP?	n	n: 512 (Down Link Only), 256,128,64,32,16,8,4
		SF_CDANAL n	SF_CDANAL?	n	
	Up Link I	SF_CDP n,I	SF_CDP? I	n	n:256,128,64,32,16,8,4
	Up Link Q	SF_CDP n,Q	SF_CDP? Q	n	
Auto Rate Detection	On	AUTODET ON	AUTODET?	ON	
	Off	AUTODET OFF	AUTODET?	OFF	

*1: Available only for MX860x01B/MX268x01B

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Spreading Factor (Code Domain)		SF_CDANAL n	SF_CDANAL?	n	n: <Up Link> 4, 8, 16, 32, 64, 128, 256 <Down Link> 4, 8, 16, 32, 64, 128, 256, 512
Refresh Wave Memory	On	TAKEWAVE_MOD ON	TAKEWAVE_MOD?	ON	*1
	Off	TAKEWAVE_MOD OFF		OFF	
Operation Trace	Code vs Time	OPRTTR CDVSTM	OPRTTR?	CDVSTM	*1
	Code Domain	OPRTTR CODE		CODE	
Trace View	Code vs Time & Code Domain	TRVIEW_MOD CDCDVSTM	TRVIEW_MOD?	CDCDVSTM	*1
	Code vs Time	TRVIEW_MOD CDVSTM		CDVSTM	
	Code Domain	TRVIEW_MOD CODE		CODE	
Scramble Code (Code Domain)	Ordinary	CODEDANAL ORD	CODECDANAL?	ORD	*1
	Left Alternative	CODECDANAL LALTN		LALTN	
	Right Alternative	CODECDANAL RALTN		RALTN	
Zoom	Zoom In	ZOOM_MOD IN	ZOOM_MOD?	IN	*1
	Zoom Out	ZOOM_MOD OUT		OUT	
Unit for Code vs Time	dBm	UNIT_MOD DBM	UNIT_MOD?	DBM	
	dB	UNIT_MOD DB		DB	
Unit for Code Domain Power	dBm	UNIT_CDP DBM	UNIT_CDP?	DBM	*1
	dB	UNIT_CDP DB		DB	
Unit	dBm	UNIT_MOD DBM	UNIT_MOD?	DBM	*1
	dB	UNIT_MOD DB		DB	
Compressed Frame Marker Mode	Auto	CFMKR_MOD AUTO	CFMKR_MOD?	AUTO	*1
	Manual	CFMKR_MOD MAN		MAN	
DTX Setup	Off	DTXSETUP_MOD OFF	DTXSETUP_MOD?	OFF	*1
	On	DTXSETUP_MOD ON	DTXSETUP_MOD?	ON	
PICH Channelization Code		PICHCNO_MOD n	PICHCNO_MOD?	n	n : 0 to 255 *1
PICH Timing Offset		PICHTIMINGOFS_MOD n	PICHTIMINGOFS_MOD?	n	n : 0 to 149 *1

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Channel Setup	Down Link	SETCH_CDVSTM na,nb,nc	SETCH_CDVSTM? nc	na,nb	na: Channelization Code nb: Spreading Factor nc: <Down Link> 1 <Down Link(Compress)> 1 (Normal Frame) 2 (Compressed Frame) <Up Link> 1 (I) 2 (Q) *1
Compressed Frame Scramble Code	Ordinary	CFSC_CDVSTM ORD	CFSC_CDVSTM?	ORD	Compressed Frame Marker Mode: Auto *1
	Alternative	CFSC_CDVSTM ALTN		ALTN	
	Ordinaly	CFSC_CDVSTM ORD		ORD	Compressed Frame Marker Mode: Manual *1
	Left Alternative	CFSC_CDVSTM LALTN		LALTN	
	Right Alternative	CFSC_CDVSTM RALTN		RALTN	
Slot Length		SLTLEN_MOD n	SLTLEN_MOD?	n	n: 15 to 150 *1
Filter Type	Tx Power	FLTTYPE_MOD TXPOWER	FLTTYPE_MOD?	TXPOWER	*1
	Filtered Power	FLTTYPE_MOD RRCFILTER		RRCFILTER	
Result Type	Normal	RSLTTYPE_MOD NRM	RSLTTYPE_MOD?	NRM	*1
	Average	RSLTTYPE_MOD AVG		AVG	
Scrambling Code Result			SCCODENO_MOD?	h	h: <Down Link> 00000 to 3FFFF <Up Link> 000000 to FFFFFF
Marker Mode	Normal	MKR_MOD NRM	MKR_MOD?	NRM	
	Off	MKR_MOD OFF		OFF	
Marker Type	Normal	MKR_CDVSTM NRM	MKR_CDVSTM?	NRM	*1
	Zoom	MKR_CDVSTM ZOON		ZOOM	

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Marker Position	Costellation, Eye Diagram, EVM, Phase Error, Magnitude Error	MKP_MOD r	MKP_MOD?	r	r: 0 to (Analysis Length – 1) chip
	Code Domain	MKP_CDP n	MKP_CDP?	n	n: 0 to Max Marker Position
		MKP_CDP n,I	MKP_CDP? I		
		MKP_CDP n,Q	MKP_CDP? Q		
	Code vs Time (Normal Marker)	MKPSLT_CDVSTM n	MKPSLT_CDVSTM?	n	n: 1 to Slot Length *1
	Code vs Time (Zoom Marker)	MKPZOOM_CDVSTM n	MKPZOOM_CDVSTM?		n: 1 to (Slot Length – 14) *1
Marker Level	Constellation, Eye Diagram, EVM, Phase Error, Magnitude Error	—	MKL_MOD?	r	
		—	MKL_MOD? I		
		—	MKL_MOD? Q		
	Code Domain Power (Relative)	—	MKCDP?	l	
		—	MKCDP? I		
		—	MKCDP? Q		
	Code Domain Power (Absolute)	—	MKCDPABS?	l	
		—	MKCDPABS? I		
		—	MKCDPABS? Q		

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Marker Level	Code Domain Error	—	MKCDPERR?	l	
		—	MKCDPERR? I		
		—	MKCDPERR? Q		
	Waveform Quality	—	MKWAV?	l	
		—	MKWAV? I		
		—	MKWAV? Q		
	Spreading Factor	—	MKSF?	n	
		—	MKSF? I		
		—	MKSF? Q		
	Channelization Code Number	—	MKSCNO?	n	
		—	MKSCNO? I		
		—	MKSCNO? Q		
	Signal	—	MKSGNL?	s	
		—	MKSGNL? I		
		—	MKSGNL? Q		
	Max Marker Position	—	MKPMAX_CDP?	n	
		—	MKPMAX_CDP? I		
		—	MKPMAX_CDP? Q		
	Code vs Time	—	MKCDVSTM? n	la,lb	n: <Up Link> 0: Total 1: I Channel 2: Q Channel <Down Link> 0: Total 1: Channel <Down Link (Compress)> 0: Total 1: NF Channel 2: CF Channel *1
		—	MKCDVSTM? n,REL	la	
		—	MKCDVSTM? n,ABS	lb	
	Carrier Frequency Error for Code vs Time	—	MKCDVSTMCARRFERR? u	f	u: HZ or PPM *1
	Scrambling Code Number for Code vs Time	—	MKCDVSTMSCCODENO?	n	*1
Adjust Range		ADJRNG	-----	-----	

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Power Calibration		PWRCAL	PWRCAL?	l	l: –10.00 to 10.00 dB *2
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCALDATA	—	—	*1, *3
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *3
Calibration Cancel		CALCANCEL	—	—	
Calibration Value		CALVAL l	CALVAL?	n,l	n:mode (0:Uncalibrated, 1:Internal calibrated 2:External writing, 3:Internal calibrated (Multi Carr.Cal) l: –10.00 to 10.00 dB
Averaged Code Domain Power		—	SLTAVG_MOD? na	lb,lc	na: 0, 1, 2, ALL *1
		—	SLTAVG_MOD? na, REL	lb	na:1, 2, ALL
		—	SLTAVG_MOD? na,ABS	lc	na: 0, 1, 2, ALL *1
Averaged Carrier Frequency Error		—	SLTAVGCARRFERR? u	f	u: HZ or PPM *1
All Slot Scrambling Code Number	All	—	SLTAVGSCCODENO? ALL	n, PASS n, FAIL n, OFF	n: Scrambling code number *1
	Number		SLTAVGSCCODENO? NUMBER	n	
	Judge		SLTAVGSCCODENO? JUDGE	PASS FAIL OFF	

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MX860x.

*3: Available only when MS8609A-33 is installed.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Result	Tx Power	—	TXPWR? u	l	u: DBM or WATT
	Carrier Frequency	—	CARRF?	f	
	Carrier Frequency Error	—	CARRFERR?	f	
		—	CARRFERR? HZ	f	
		—	CARRFERR? PPM	r	unit: ppm
	Waveform Quality Factor		WAVQUAL?	r	
	RMS EVM	—	VECTERR?	r	unit:%
	Peak EVM	—	PVECTERR?	r	unit:%
	Phase Error	—	PHASEERR?	r	unit:deg
	Magnitude Error	—	MAGTDERR?	r	unit:%
	Origin Offset	—	ORGNOFS?	l	
	Timing Offset	—	TIMINGOFS?	l	
	SCH Level	—	SCHPWR?	la,lb,lc	la: Primary SCH lb: Secondary SCH lc: Total SCH *1
		—	SCHPWR? PSCH	la	
		—	SCHPWR? SSCH	lb	
		—	SCHPWR? TSCH	lc	
		—	SCHPWR? ALL	la,lb,lc	
	Peak Code Domain Error	—	PPCDPERR?	l	*1
		—	PPCDPERR? ERR		
		—	PPCDPERR? CH	na	na:Channelization Code Number *1
		—	PPCDPERR? SF	nb	nb:Spreading Factor *1
		—	PPCDPERR? PHASE	a	a: I or Q *1

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Wave Data	I Phase Data (Constellation, Eye Diagram)	XMC 0,na,nb	XMC? 0,nc,nd	ne(1),ne(2),….,ne(nd)	na: 0 to 25590 (white address for data) nb: −32768 to 32767 (write data) nc: 0 to 25591 (read address for data) nd: 1 to 25600 (number of reading points) ne: −32768 to 32767 (reading data ideal signal "1"= 1000)
	Q Phase Data (Constellation, Eye Diagram)	XMC 1,na,nb	XMC? 1,nc,nd		
	Origin I–Q Signal	OXMC, na,nb	OXMC? na	nc	na: 0,1 nb: −32768 to 32767 *1
	EVM	XMV na,nb	XMV? nc,nd	ne(1),ne(2),….,ne(nd)	na: 0 to 2559 (white address for data) nb: −32768 to 32767 (write data) nc: 0 to 2559 (read addres for data) nd: 1 to 2560 (number of reading points) ne: −32768 to 32767 (read-data 1 % = 100)
	Phase Error	XMP na,nb	XMP? nc,nd		
	Magnitude Error	XMN na,nb	XMN? nc,nd		

*1: Available only for MX860x01B/MX268x01B.

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Code Domain Data	One Point	—	CDANAL? na,nb	la,lb,r,lc	na: Spreading Factor nb:Channelization Code Number la: Code Domain Power (Relative) lb: Code Domain Error r: Waveform Quarlity lc: Code Domain Power (Absolute)
		—	CDANAL? na,nb,I		
		—	CDANAL? na,nb,Q		
	Code Domain Power (Relative)	—	CDANAL? PWR	na1,nb1,la1,na2,nb2,la2…	na: Spreading Factor nb:Channelization Code Number la: Code Domain Power (Relative)
		—	CDANAL? PWR,I		
		—	CDANAL? PWR,Q		
	Code Domain Error	—	CDANAL? ERR	na1,nb1,lb1,na2,nb2,lb2,…	na: Spreading Factor nb: Channelization Code Number lb: Code Domain Error
		—	CDANAL? ERR,I		
		—	CDANAL? ERR,Q		
	Waveform Quality	—	CDANAL? WAVE	na1,nb1,r1,na2,nb2,r2,…	na: Spreading Factor nb: Channelization Code Number r: Waveform Quality
		—	CDANAL? WAVE,I		
		—	CDANAL? WAVE,Q		
	Code Domain Power (Absolute)	—	CDANAL? PWRABS	na1,nb1,lc1,na2,nb2,lc2,…	na: Spreading Factor nb: Channelization Code Number lc: Code Domain Power (Absolute)
		—	CDANAL? PWRABS,I		
		—	CDANAL? PWRABS,Q		

Modulation Analysis (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Code Domain Error	All	—	CDANAL? ALL	na1,nb2,la1,lb1,r1,lc1,na2,nb2,la2,lb2,r2,lc2,…	na: Spreading Factor nb: Chanellization Code Number la: Code Domain Power (Relative) lb: Code Domain Error r: Waveform Quarlity lc: Code Domain Power (Absolute)
		—	CDANAL? ALL,I		
		—	CDANAL? ALL,Q		
Code vs Time		—	SLTCDPWR? na,nb	la,lb	na: <Up Link> 0: Total 1: I Channel 2: Q Channel <Down Link> 0: Total 1: Channel <Down Link (Compress)> 0: Total 1: NF Channel 2: CF Channel nb: Slot Number la: Relative Power lb: Absolute Power *1
		—	SLTCDPWR? na,nb, REL	la	
		—	SLTCDPWR? na,nb, ABS	lb	
Carrier Frequency Error for Code vs Time		—	SLTCARRFERR? n,u	f	n: slot number u: HZ or PPM f: frequency Error *1
Scrambling Code Number for Code vs Time		—	SLTSCCODENO? n	a	n: slot number a: Scrambling Code Number *1
Measure Result	Total Active Channel	—	TOTALSNGL?	n	*1
		—	TOTALSNGL? I		
	Channel Number	—	TOTALSNGL? Q		

*1: Available only for MX860x01B/MX268x01B.

Transmitter Power

The list below shown correspondence between the external control commands and the reading of setting items and measured results on the Transmitter Power screen (including the Setup TPC screen).

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Method	Filtered Power & Tx Power	DSPL RFPWR, FILTER	DSPL?	RFPWR,FILTER	
	Filtered Power	DSPL RFPWR, RRCFILTER		RRCFILTER	
	Tx Power	DSPL RFPWR NONFILTER		NONFILTER	
	TPC	DSPL RFPWR,TPC		RFPWR,TPC	
	RACH	DSPL RFPWR,RACH		RFPWR,RACH	*1
Waveform Display	On	WAVEFORM ON	WAVEFORM?	ON	
	Off	WAVEFORM OFF		OFF	
Smoothing Filter	On	SMOFLT ON	SMOFLT?	ON	
	Off	SMOFLT OFF		OFF	
Level	Relative	LVLREL_RFPWR ON	LVLREL_RFPWR?	ON	*1
	Absolute	LVLREL_RFPWR OFF		OFF	
Analysis Length		ANLYLEN_RFPWR t	ANLYLEN_RFPWR?	t	t: <TPC> 400.0 to 666.5 <RACH> 400.0 to 1066.5 *1
Slot Length		SLTLEN_RFPER n	SLTLEN_RFPWR?	n	n: 15 to 150 *1
Capture Time		CAPTIME_RFPWR t	CAPTIME_RFPWR?	t	t: 10 to 100 msec *1
Trace View	Total & Expand	TRVIEW_RFPWR EXPNDTOTAL	TRVIEW_RFPWR?	EXPNDTOTAL	*1
	Total	TRVIEW_RFPWR TOTAL		TOTAL	
	Expand	TRVIEW_RFPWR EXPND		EXPND	
Window	Slot	WINDOW_RFPWR SLOT	WINDOW_RFPWR?	SLOT	*1
	Leading	WINDOW_RFPWR LEAD		LEAD	
	Trailing	WINDOW_RFPWR TRAIL		TRAIL	
	Leading & Trailing	WINDOW_RFPWR LEADTRAIL		LEADTRAIL	
Zoom	Zoom In	ZOOM_RFPWR IN	ZOOM_RFPWR?	IN	*1
	Zoom Our	ZOOM_RFPWR OUT		OUT	

*1: Available only for MX860x01B/MX268x01B.

Transmitter Power (continued.)

<table>
<tr><th>Function</th><th>Item</th><th>Program Message</th><th>Query Message</th><th>Response Message</th><th>Remarks</th></tr>
<tr><td rowspan="4">Operation Trace</td><td>Total</td><td>OPRTTR_RFPWR TOTAL</td><td rowspan="4">OPRTTR_RFPWR?</td><td>TOTAL</td><td rowspan="4">*1</td></tr>
<tr><td>Expand</td><td>OPRTTR_RFPWR EXPND</td><td>EXPND</td></tr>
<tr><td>Total (Trail)</td><td>OPRTTR_RFPWR TOTALTRAIL</td><td>TOTALTRAIL</td></tr>
<tr><td>Expand (Trail)</td><td>OPRTTR_RFPWR EXPNDTRAIL</td><td>EXPNDTRAIL</td></tr>
<tr><td rowspan="3">Vertical Scale</td><td>Total</td><td>VSCALE_RFPWR TOTAL,la,lb</td><td>VSCALE_RFPWR? TOTAL</td><td>la,lb,TOTAL</td><td rowspan="3">la (Range):
20,40,60,80,100 dB
lb (Top Level):
0 to 50 dB
or
(Reference Level – 50) to (Reference Level + 50) dB
*1</td></tr>
<tr><td>Leading</td><td>VSCALE_RFPWR LEAD,la,lb</td><td>VSCALE_RFPWR? LEAD</td><td>la,lb,LEAD</td></tr>
<tr><td>Trailing</td><td>VSCALE_RFPWR TRAIL,la,lb</td><td>VSCALE_RFPWR? TRAIL</td><td>la,lb,TRAIL</td></tr>
<tr><td rowspan="2">Filter Type</td><td>Tx Power</td><td>FLTTYPE_RFPWR TXPOWER</td><td rowspan="2">FLTTYPE_RFPWR?</td><td>TXPOWER</td><td rowspan="2">*1</td></tr>
<tr><td>RRC</td><td>FLTTYPE_RFPWR RRCFILTER</td><td>RRCFILTER</td></tr>
<tr><td rowspan="2">Marker Mode</td><td>Normal</td><td>MKR_RFPWR NRM</td><td rowspan="2">MKR_RFPWR?</td><td>NRM</td><td rowspan="2"></td></tr>
<tr><td>Off</td><td>MKR_RFPWR OFF</td><td>OFF</td></tr>
<tr><td rowspan="2">Marker Type</td><td>Slot</td><td>MKR_TPC NRM</td><td rowspan="2">MKR_TPC?</td><td>NRM</td><td rowspan="2">*1</td></tr>
<tr><td>Zoom</td><td>MKR_TPC ZOOM</td><td>ZOOM</td></tr>
<tr><td colspan="2">Marker Position</td><td>MKP_RFPWR t</td><td>MKP_RFPWR?</td><td>t</td><td>t: –30.0 to 700.0 usec</td></tr>
<tr><td colspan="2" rowspan="3">TPC Marker Position (Total Waveform)</td><td>MKPTOTAL_RFPWR la</td><td>MKPTOTAL_RFPWR?</td><td rowspan="3">la</td><td rowspan="3">*1</td></tr>
<tr><td>MKPTOTAL_RFPWR la,LEAD</td><td>MKPTOTAL_RFPWR? LEAD</td></tr>
<tr><td>MKPTOTAL_RFPWR la,TRAIL</td><td>MKPTOTAL_RFPWR? TRAIL</td></tr>
<tr><td colspan="2">RACH Marker Position (Total Waveform)</td><td>MKP_RACH n</td><td>MKP_RACH?</td><td>n</td><td>n: 1 to
(Total Preamble)
*1</td></tr>
<tr><td colspan="2">Marker Position (Expand Waveform)</td><td>MKPEXPND_RFPWR la,lb</td><td>MKPEXPND_RFPWR? lb</td><td>la</td><td>*1</td></tr>
<tr><td colspan="2">Marker Level</td><td>-----</td><td>MKL_RFPWR?</td><td>l</td><td></td></tr>
</table>

*1: Available only for MX860x01B/MX268x01B.

Transmitter Power (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Marker Level (Expand waveform)		—	MKLEXPND_RFPWR?	l	*1
	Leading	—	MKLEXPND_RFPWR? LEAD		
	Trailing	—	MKLEXPND_RFPWR? TRAIN		
Storage Mode	Normal	STRG_RFPWR NRM	STRG_RFPWR?	NRM	
	Average	STRG_RFPWR AVG		AVG	
Average Count		AVR_RFPWR n	AVR_RFPWR?	n	n: 2 to 9999
Refresh Interval		INTVAL_RFPWR EVERY	INTVAL_RFPWR?	EVERY	
		INTVAL_RFPWR ONCE		ONCE	
Tester Root Zero Set		TZEROSET	—	—	*1
Tester Root Zero Set Value		—	TZEROSETVAL?	l	*1
Tester Root Zero Set Value Setting		TZEROSET_SW n	TZEROSET_SW?	n	n: 0 or 1 *1
Adjust Range		ADJRNG	—	—	
Adjust Range Offset	0 dB	ADJRNGOFS 0	ADJRNGOFS?	0	
	10 dB	ADJRNGOFS 10		10	
Power Calibration		PWRCAL	PWRCAL?	l	l: –10.00 to 10.00 dB *2
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCALDATA	—	—	*1, *3
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *3
Calibration Cancel		CALCANCEL	—	—	
Calibration Value		CALVAL l	CALVAL?	n,l	n: mode (0: Uncalibrated, 1: Internal calibrated 2: External writing 3: Internal calibrated (Multi Carr. Cal)) l: –10.00 to 10.00 dB
Setup TPC		DSPL SETTPC	DSPL?	SETTPC	
Setup TPC2		DSPL SETTPC2	DSPL?	SETTPC2	*1
Input Level (Slot 1)		INPLVL l	INPLVL?	l	l: –70.00 to 50.00 dBm
Transmitter Power Control (Slot 2 to 15)	1 slot	TPC na,UP,nb	TPC? na	UP,nc	na: 2 to 150 nb: 1,2,3 *1
		TPC na,DN,nb		DN,nc	
		TPC na,NO,nb		NO,nc	
	All	ALLTPC UP,n	—	—	n: 1,2,3 *1
		ALLTPC DN,n		—	
		ALLTPC NO,n		—	

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: Available only when MS8609A-33 is installed.

Transmitter Power (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Judgement	On	JALLTPC ON	JALLTPC?	ON	
	Off	JALLTPC OFF		OFF	
Relative Limit		RLALLTPC la,lb,lc	RLALLTPC? lb,lc	ld	la: 0.00 to 99.99 dB lb: 0,1,2 (Command) lc: 1,2,3 (step)
Absolute Limit		ALALLTPC l	ALALLTPC?	l	l: 0.00 to 99.99dB
Power Control Tolerance		RLTPCTOL la,lb,na,nb	RLTPCTOL? na,nb	l	la: –99.99 to 99.99 dB (Lower Limit) lb: –99.99 to 99.99 dB (Upper Limit) na: 0,1,2 (Command) nb: 1,2,3 (Step) *1
Measure Result	Tx Power	—	TXPWR? u	l	u: DBM or WATT
	Filtered Power	—	FILTERPWR? u	l	u: DBM or WATT
	RC Filtered Power	—	RCFILTERPWR? u	l	u: DBM or WATT *1
	Wide Tx Power	—	WIDETXPWR? u	l	u: DBM or WATT *1
	Off Power	—	OFFPWR? u	la,lb,lc	u: DBM or WATT la: Average lb: Leading lc: Trailing *1
	Ratio	—	RATIO?	l	
	Total Premble	—	TOTALPREAM?	n	
	Signature	—	SIGNATURE?	n	n: 0 to 15 *1
	Timing (p-m)	—	TIMINGPM?	l	
	Timing (t-p)	—	TIMINGTP?	l	*1
	Slot Power (Relative & Absolute)	—	SLTPWR? n	la,lb	n: 1 to 15 (Slot) la: slot n relative level lb: slot n absolute level

*1: Available only for MX860x01B/MX268x01B

Transmitter Power (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Result	Slot Power (Relative)	—	SLTPWR? n,REL	la	n: 1 to15 (Slot) la: slot n relative level
	Slot Power (Absolute)	—	SLTPWR? n,ABS	lb	n: 1 to15 (Slot) lb: slot n absolute level
	Slot Power (All)	—	SLTPWR? ALL	la1,lb1,la2,lb2,…, la15,lb15	n: 1 to15 (Slot) la: slot n relative level lb: slot n absolute level
	Slot Power (Relative All)	—	SLTPWR? ALL,REL	la1,la2,la3, …, la15	la: slot n relative level
	Slot Power (Absolute All)	—	SLTPWR? ALL,ABS	lb1,lb2,lb3, …, lb15	lb: slot n absolute level
	Judgment (Relative & Absolute)	—	TPCPASS? n	ja,jb	n: 1 to 15 (Slot) ja: judgment of slot n relative limit jb: judgment of slot n absolute limit
	Judgment (Relative)	—	TPCPASS? n, REL	ja	n: 1 to 15 (Slot) ja: judgment of slot n relative limit
	Judgment (Absolut)	—	TPCPASS? n, ABS	jb	n: 1 to 15 (Slot) jb: judgment of slot n absolute limit
	Judgment (ALL)	—	TPCPASS? ALL	ja1,jb1,ja2,jb2, …, ja15,jb15	ja: judgment of slot n relative limit jb: judgment of slot n absolute limit
	Judgment (Relative All)	—	TPCPASS? ALL, REL	ja1,ja2,ja3, …, ja15	ja: judgment of slot n relative limit
	Judgment (Absolute All)	—	TPCPASS? ALL, ABS	jb1,jb2,jb3, …, jb15	jb: judgment of slot n absolute limit
	Total Judgment	—	TOTALPASS?	j	j: total judgmemt

Transmitter Power (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Wave Data		XMD na,nb	XMD? nc,nd	ne(1),ne(2),…,ne(nd)	na: 0 to 292(Tx Power, Filtered Power),3468(TPC),5068(RACH) (write address for data) nb: −32768 to 32767 (write data 1 dBm = 100) nc: 0 to 292(Tx Power, Filtered Power),3468(TPC),5068(RACH) (read-start address for data) nd: 1 to 293(Tx Power Filtered Power),3469(TPC),5069(RACH) (number of reading data) ne: −32768 to 32767 (read data 1 dBm = 100)
Wave Data (TPC Trailing)		XMDE na,nb	XMDE? nc,nd	ne(1),ne(2),…,ne(nd)	na: 0 to 3468 (write address for data) nb: −32786 to 32767 (write data 1 dBm = 100) nc = 0 to 3468 (read-start address for data) nd = 1 to 3469 (number of reading data) ne: −32768 to 32767 (read data 1 dBm = 100) *1
Wave Data (RACH Total)		XMDR na,nb	XMDR? nc,nd	ne(1),ne(2),…,ne(nd)	na: 0 to 1040 (write address for data) nb: −32786 to 32767 (write data 1 dBm = 100) nc = 0 to 1040 (read-start address for data) nd = 1 to 1041 (number of reading data) ne: −32768 to 32767 (read data 1 dBm = 100) *1

*1: Available only for MX860x01B/MX268x01B.

Occupied Bandwidth

The list below shows the correspondence between the external control commands and the reading of the setting items and measured results on the Occupied Bandwidth screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Method	Spectrum	DSPL OBW, SPECT	DSPL?	OBW,SPECT	
	FFT	DSPL OBW, FFT		OBW,FFT	
		DSPL OBW, HIGH			
Storage Mode	Normal	STRG_OBW NRM	STRG_OBW?	NRM	
	Average	STRG_OBW AVG		AVG	
Average Count		AVR_OBW n	AVR_OBW?	n	n: 2 to 9999
Refresh Interval	Every	INTVAL_OBW EVERY	INTVAL_OBW?	EVERY	
	Once	INTVAL_OBW ONCE		ONCE	
Ref Level		RL_OBW l	RL_OBW?	l	
Attenuator Ref Level Mode	Auto	ATTRLMD_OBW AUTO	ATTRLMD_OBW?	AUTO	
	Manual	ATTRLMD_OBW MAN		MAN	
Attenuator		ATT_OBW l	ATT_OBW?	l	
Attenuator Mode	Auto	ATTMD_OBW AUTO	ATTMD_OBW?	AUTO	
	Manual	ATTMD_OBW MAN		MAN	
RBW		RBW_OBW n	RBW_OBW?	n	
RBW Type	Normal	RBD_OBW NRM	RBD_OBW?	NRM	
	Digital	RBD_OBW DGTL		DGTL	
VBW		VBW_OBW n	VBW_OBW?	n	
VBW Mode	Auto	VBM_OBW AUTO	VBM_OBW?	AUTO	
	Manual	VBM_OBW MAN		MAN	
VBW/RBW Ratio		VBR_OBW n	VBR_OBW?	n	
Sweep Time		SWT_OBW t	SWT_OBW?	t	
Sweep Time Mode	Auto	STM_OBW AUTO	STM_OBW?	AUTO	
	Manual	STM_OBW MAN		MAN	
Detection	Position	DET_OBW POS	DET_OBW?	POS	
	Sample	DET_OBW SMP		SMP	
	Negative	DET_OBW NEG		NEG	
	Average	DET_OBW AVG		AVG	
	RMS	DET_OBW RMS		RMS	
Data Points	501	DPTS_OBW 501	DPTS_OBW?	501	
	1001	DPTS_OBW 1001		1001	

Occupied Bandwidth (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Adjust Range		ADJRNG	—	—	
Power Calibration		PWRCAL	PWRCAL?	l	*1
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCALDATA	—	—	*1, *2
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *2
Caribration Cancel		CALCANCEL	—	—	
Calibration Value		CALVAL l	CALVAL?	n,l	n: mode (0: Uncalibrated, 1: Internal calibrated, 2: External writing, 3: Internal calibrated (multi Carr.Cal)) l: –10.00 to 10.00 dB
Measure Result	Occupied Bandwidth	—	OCCBW?	f	
		—	OBW?	f	
	Upper Limit	—	OBWFREQ? UPPER	f	
		—	OBWFREQ? +	f	
	Lower Limit	—	OBWFREQ? LOWER	f	
		—	OBWFREQ? -	f	
	Center (Upper + Lower)/ 2	—	OBWFREQ? CENTER	f	
	Span Width	—	FSPAN_OBW?	f	
Wave Data		XME na,nb	XME? nc,nd	ne(1),ne(2), ...,ne(nd)	na: 0 to 500/1000 (write address for data) nb: –32768 to 32767 (write data of a 16-bit waveform) nc: 0 to 500/1000 (read-start address for data) nd: 0 to 501/1001 (number of reading points) ne: –32768 to 32767 (read data of a 16-bit waveform)

*1: Valid only when this unit is MS860x.

*2: Available only when MS8609A-33 is installed.

Adjacent Channel Power

The list below shows the correspondence between the external control commands and the reading of the setting items and measured results on the Adjacent Channel Power screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Method	Spectrum (All)	DSPL ADJ,SPECT	DSPL?	ADJ,SPECT1	
		DSPL ADJ,SPECT1			
	Sprectrum (Separate)	DSPL ADJ,SPECT2		ADJ,SPECT2	
	Modulation	DSPL ADJ,MOD		ADJ,MOD	
Wide Dynamic Range	On	WIDE_ADJ ON	WIDE_ADJ?	ON	
	Off	WIDE_ADJ OFF		OFF	
RRC Filter	On	RRCFLT_ADJ ON	RRCFLT_ADJ?	ON	
	Off	RRCFLT_ADJ OFF		OFF	
Unit	dB	UNIT_ADJ DB	UNIT_ADJ?	DB	
	dBm	UNIT_ADJ DBM		DBM	
	mW	UNIT_ADJ MW		MW	
	uW	UNIT_ADJ UW		UW	
	nW	UNIT_ADJ NW		NW	
Storage Mode	Normal	STRG_ADJ NRM	STRG_ADJ?	NRM	
	Average	STRG_ADJ AVG		AVG	
Average Count		AVR_ADJ n	AVR_ADJ?	n	n: 2 to 9999
Refresh Interval	Every	INTVAL_ADJ EVERY	INTVAL_ADJ?	EVERY	
	Once	INTVAL_ADJ ONCE		ONCE	
Ref Level		RL_ADJ l	RL_ADJ?	l	
Attenuator Ref Level Mode	Auto	ATTRLMD_ADJ AUTO	ATTRLMD_ADJ?	AUTO	
	Manual	ATTRLMD_ADJ MAN		MAN	
Attenuator		ATT_ADJ l	ATT_ADJ?	l	
Attenuator Mode	Auto	ATTMD_ADJ AUTO	ATTMD_ADJ?	AUTO	
	Manual	ATTMD_ADJ MAN		MAN	
RBW		RBW_ADJ n	RBW_ADJ?	n	
RBW Type	Normal	RBD_ADJ NRM	RBD_ADJ?	NRM	
	Digital	RBD_ADJ DGTL		DGTL	
VBW		VBW_ADJ n	VBW_ADJ?	n	
VBW Mode	Auto	VBM_ADJ AUTO	VBM_ADJ?	AUTO	
	Manual	VBM_ADJ MAN		MAN	
VBW/RBW Ratio		VBR_ADJ n	VBR_ADJ?	n	
Sweep Time		SWT_ADJ t	SWT_ADJ?	t	
Sweep Time Mode	Auto	STM_ADJ AUTO	STM_ADJ?	AUTO	
	Manual	STM_ADJ MAN		MAN	

Adjacent Channel Power (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Detection	Positive	DET_ADJ POS	DET_ADJ?	POS	
		DET_ADJ POS,SPECT1	DET_ADJ? SPECT1		
		DET_ADJ POS,SPECT2	DET_ADJ? SPECT2		
	Sample	DET_ADJ SMP	DET_ADJ?	SMP	
		DET_ADJ SMP,SPECT1	DET_ADJ? SPECT1		
		DET_ADJ SMP,SPECT2	DET_ADJ? SPECT2		
	Negative	DET_ADJ NEG	DET_ADJ?	NEG	
		DET_ADJ NEG,SPECT1	DET_ADJ? SPECT1		
		DET_ADJ NEG,SPECT2	DET_ADJ? SPECT2		
	Average	DET_ADJ AVG	DET_ADJ?	AVG	
		DET_ADJ AVG,SPECT1	DET_ADJ? SPECT1		
		DET_ADJ AVG,SPECT2	DET_ADJ? SPECT2		
	RMS	DET_ADJ RMS	DET_ADJ?	RMS	
		DET_ADJ RMS,SPECT1	DET_ADJ? SPECT1		
		DET_ADJ RMS,SPECT2	DET_ADJ? SPECT2		
Data Points		DPTS_ADJ n	DPTS_ADJ?	n	n: 501, 1001 *1
		DPTS_ADJ n,SPECT1	DPTS_ADJ? SPECT1		
		DPTS_ADJ n,SPECT2	DPTS_ADJ? SPECT2		

*1: Available only for MX860x01B/MX268x01B.

Adjacent Channel Power (continued.)

<table>
<tr><th>Function</th><th>Item</th><th>Program Message</th><th>Query Message</th><th>Response Message</th><th>Remarks</th></tr>
<tr><td colspan="2">Adjust Range</td><td>ADJRNG</td><td>—</td><td>—</td><td></td></tr>
<tr><td colspan="2">Power Callibration</td><td>PWRCAL</td><td>PWRCAL?</td><td>l</td><td>*2</td></tr>
<tr><td colspan="2">Multi Carrier Calibration</td><td>MLTCARRCAL</td><td>—</td><td>—</td><td></td></tr>
<tr><td colspan="2">Load Multi Carrier Calibration</td><td>LOADMLTCALDATA</td><td>—</td><td>—</td><td>*1, *3</td></tr>
<tr><td colspan="2">Write Multi Carrier Calibration</td><td>WRTMLTCALDATA</td><td>—</td><td>—</td><td>*1, *3</td></tr>
<tr><td colspan="2">Callibration Cancel</td><td>CALCANCEL</td><td>—</td><td>—</td><td></td></tr>
<tr><td colspan="2">Calibration Value</td><td>CALVAL l</td><td>CALVAL?</td><td>n,l</td><td>n: mode
(0: Not calibrated,
1: Internal calibrated,
2: External writing
3: Internal calibrated
(Multi Carr,cal))
l: –10.00 to 10.00 dB</td></tr>
<tr><td rowspan="2">Marker Mode</td><td>Normal</td><td>MKR_ADJ NRM</td><td>MKR_ADJ?</td><td>NRM</td><td></td></tr>
<tr><td>Off</td><td>MKR_ADJ OFF</td><td>MKR_ADJ?</td><td>OFF</td><td></td></tr>
<tr><td rowspan="3">Marker Position</td><td>Point</td><td>MKP_ADJ n</td><td>MKP_ADJ?</td><td>n</td><td>n: 38 to 462
(Data point 501)
76 to 924
(Data point 1001)</td></tr>
<tr><td rowspan="2">Frequency</td><td>MKRS_ADJ f</td><td>MKRS_ADJ?</td><td>f</td><td>f: –10.60 to
+10.60 MHz</td></tr>
<tr><td>MKN_ADJ f</td><td>MKN_ADJ?</td><td>f</td><td>f: –10.60 to
+10.60 MHz</td></tr>
<tr><td colspan="2" rowspan="2">Marker Level</td><td>—</td><td>MKL_ADJ?</td><td>l</td><td></td></tr>
<tr><td>—</td><td>MKL_ADJ? u</td><td>l</td><td>u: DB, DBM,
WATT</td></tr>
</table>

*1: Available only for MX860x01B/MX268x01B.

*2: Valid for when this unit is MS860x.

*3: Available only when MS8609A-33 is installed.

Adjacent Channel Power (continued.)

<table>
<tr><th>Function</th><th colspan="2">Item</th><th>Program Message</th><th>Query Message</th><th>Response Message</th><th>Remarks</th></tr>
<tr><td rowspan="27">Measure Result</td><td colspan="2" rowspan="2">Tx Power</td><td>—</td><td>TXPWR? u</td><td>l</td><td>u: DBM or WATT</td></tr>
<tr><td>—</td><td>ADJCH?</td><td>l</td><td>unit: dBm</td></tr>
<tr><td colspan="2">Filtered Power</td><td>—</td><td>CHPWR?</td><td>l</td><td>unit: dBm</td></tr>
<tr><td rowspan="20">Adjacent Channel Power (RRC Filter OFF)</td><td rowspan="4">−10.00 MHz</td><td>—</td><td>ADJCH? LOW2</td><td rowspan="4">l</td><td></td></tr>
<tr><td>—</td><td>CHPWR? LOW2</td><td></td></tr>
<tr><td>—</td><td>ADJCH? LOW2,u</td><td rowspan="2">u: DB,DBM,MW,UW, NW</td></tr>
<tr><td>—</td><td>CHPWR? LOW2,u</td></tr>
<tr><td rowspan="4">−5.00 MHZ</td><td>—</td><td>ADJCH? LOW1</td><td rowspan="4">l</td><td></td></tr>
<tr><td>—</td><td>CHPWR? LOW1</td><td></td></tr>
<tr><td>—</td><td>ADJCH? LOW1,u</td><td rowspan="2">u: DB,DBM,MW,UW, NW</td></tr>
<tr><td>—</td><td>CHPWR? LOW1,u</td></tr>
<tr><td rowspan="4">5.00 MHz</td><td>—</td><td>ADJCH? UP1</td><td rowspan="4">l</td><td></td></tr>
<tr><td>—</td><td>CHPWR? UP1</td><td></td></tr>
<tr><td>—</td><td>ADJCH? UP1,u</td><td rowspan="2">u: DB,DBM,MW,UW, NW</td></tr>
<tr><td>—</td><td>CHPWR? UP1,u</td></tr>
<tr><td rowspan="4">10.00 MHz</td><td>—</td><td>ADJCH? UP2</td><td rowspan="4">l</td><td></td></tr>
<tr><td>—</td><td>CHPWR? UP2</td><td></td></tr>
<tr><td>—</td><td>ADJCH? UP2,u</td><td rowspan="2">u: DB,DBM,MW,UW, NW</td></tr>
<tr><td>—</td><td>CHPWR? UP2,u</td></tr>
<tr><td rowspan="4">All</td><td>—</td><td>ADJCH? ALL</td><td rowspan="4">la,lb,lc,ld</td><td rowspan="2">la: level at −10.00 MHz
lb: level at −5.00 MHz
lc: level at 10.00 MHz
ld: level at 5.00 MHz</td></tr>
<tr><td>—</td><td>CHPWR? ALL</td></tr>
<tr><td>—</td><td>ADJCH? ALL,u</td><td rowspan="2">la: level at −10.00 MHz
lb: level at −5.00 MHz
lc: level at 10.00 MHz
ld: level at 5.00 MHz
u: DB,DBM,MW,UW, NW</td></tr>
<tr><td>—</td><td>CHPWR? ALL,u</td></tr>
<tr><td colspan="2">Span Width</td><td>—</td><td>FSPAN_ADJ?</td><td>f</td><td>u: DB,DBM,MW,UW, NW</td></tr>
</table>

Adjacent Channel Power (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Measure Result	Adjacent Channel Power (RRC Filter On)	−10.00 MHz	—	ACPRRC? LOW2,u	l	u: DB,DBM,MW,UW,NW
		−5.00 MHz	—	ACPRRC? LOW1,u		
		+5.00 MHz	—	ACPRRC? UP1,u		
		+10.00 MHz	—	ACPRRC? UP2,u		
		All	—	ACPRRC? ALL,u	la,lb,lc,ld	la: level at −10.00 MHz lb: level at −5.00 MHz lc: level at 5.00 MHz ld: level at 10.00 MHz u: DB,DBM,MW,UW, NW
Wave Data	Spectrum All		XMB na,nb	XMB? nc,nd	ne(1),ne(2), . ..,ne(nd)	na: 0 to 500/1000 (write address for data) nb: −32768 to 32767 (write data) nc: 0 to 500/1000 (read-start address for data) nd: 1 to 501/1001 (number of reading points) ne: −32768 to 32767 (read data)
	Spectrum Separate		XMBS na,nb	XMBS? nc,nd	ne(1),ne(2), . ..,ne(nd)	na: 0 to 2504/5004 (write address for data) nb: −32768 to 32767 (write data) nc: 0 to 2504/5004 (read-start address for data) nd: 1 to 2505/5005 (number of reading points) ne: −32768 to 32767 (read data)
	Spectrum All Integral waveform		XMAG na,nb	XMAG? nc,nd	ne(1),ne(2), . ..,ne(nd)	na: 0 to 500/1000 (write address for data) nb: −32768 to 32767 (write data) nc: 0 to 500/1000 (read-start address for data) nd: 1 to 501/1001 (number of reading points) ne: −32768 to 32767 (read data)

Spurious Emission

The list below shows the correspondence between the external control commands and the reading of the setting items and measured results on the Spurious Emission screen.

Function	Item		Program Message	Query Message	Response Message	Remarks
Spurious Mode	Spot		DSPL SPURIOUS,SPOT	DSPL?	SPURIOUS, SPOT	
	Search		DSPL SPURIOUS, SEARCH		SPURIOUS, SEARCH	
	Sweep		DSPL SPURIOUS,SWEEP		SPURIOUS, SWEEP	
Storage Mode	Normal		STRG_SPU NRM	STRG_SPU?	NRM	*1
	Average		STRG_SPU AVG		AVG	
Average Count			AVR_SPU n	AVR_SPU?	n	n: 2 to 9999 *1
Refresh Interval	Every		INTVAL_SPU EVERY	INTVAL_SPU?	EVERY	*1
	Once		INTVAL_SPU ONCE		ONCE	
Detect Mode	Spot	Positive Peak	DET_SPU SPOT,POS	DET_SPU? SPOT	POS	
		Sample	DET_SPU SPOT,SMP		SMP	
		Negative Peak	DET_SPU SPOT,NEG		NEG	
		Average	DET_SPU SPOT,AVG		AVG	
		RMS	DET_SPU SPOT,RMS		RMS	
	Search	Positive Peak	DET_SPU SEARCH,POS	DET_SPU? SEACH	POS	
		Sample	DET_SPU SEARCH,AMP		SMP	
		Negative Peak	DET_SPU SEARCH,NEG		NEG	
		Average	DET_SPU SEARCH,AVG		AVG	
		RMS	DET_SPU SEARCH,RMS		RMS	
	Sweep	Positive Peak	DET_SPU SWEEP,POS	DET_SPU? SWEEP	POS	
		Sample	DET_SPU SWEEP,SMP		SMP	
		Negative Peak	DET_SPU SWEEP,NEG		NEG	
		Average	DET_SPU SWEEP,AVG		AVG	
		RMS	DET_SPU SWEEP,RMS		RMS	

*1: Available only for MX860x01B/MX268x01B.

Spurious Emission (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Unit	dBm		UNIT_SPU DBM	UNIT_SPU?	DBM	
	dB		UNIT_SPU DB		DB	
Preselector	Normal		BAND 0	BAND?	0	*1
	Spurious		BAND 1		1	
View	Judgement		VIEW_SPU JDG	VIEW_SPU?	JDG	
	VBW, SWT		VIEW_SPU BWSWT		BWSWT	
	Ref Level, ATT		VIEW_SPU REFATT		REFATT	
Waveform Display	Off		WAVEFORM_SPU OFF	WAVEFORM_SPU?	OFF	*2
	On		WAVEFORM_SPU ON		ON	
Display Waveform Table Number			WAVETBLNO_SPU Fn	WAVETBLNO_SPU?	Fn	*2
Setup Frequency Table	Spot		DSPL SETTBL_SPU,SPOT	DSPL?	SETTBL_SPU, SPOT	
	Search & Sweep		DSPL SETTBL_SPU,SWEEP		SETTBL_SPU, SWEEP	
Spot Table	Frequency		TBLFREQ_SPU SPOT,Fn,f	TBLFREQ_ SPU? SPOT,Fn	f	n: 1 to 15 f: 100 Hz to 7.9 GHz
	Harmonics		TBLFREQ_SPU SPOT,HRM		f	
	Attenuator or Ref Level Mode	Auto	TBLATTRLMD_SPU SPOT,AUTO	TBLATTRLMD_SPU? SPOT	AUTO	
		Manual	TBLATTRLMD_SPU SPOT,MAN		MAN	
	Attenuator Mode	Auto	TBLATTMD_SPU SPOT,AUTO	TBLATTMD_ SPU? SPOT	AUTO	
		Manual	TBLATTMD_SPU SPOT,MAN		MAN	
	Ref Level		TBLRL_SPU SPOT,Fn,l	TBLRL_SPU? SPOT,Fn	l	n: 1 to 15
	Attenuator		TBLATT_SPU SPOT,Fn,l	TBLATT_SPU? SPOT,Fn	l	n: 1 to 15
	RBW		TBLRBW_SPU SPOT,Fn,f	TBLRBW_SPU? SPOT,Fn	f	n: 1 to 15 f: 300 Hz,1 kHz, 3 kHz,10 kHz, 30 kHz,100 kHz, 300 kHz,1 MHz, 3 MHz,5 MHz, 10 MHz,20 MHz

*1: Available only when MS8608A-03 or MS2683A-03 is installed.

*2: Available only for MX860x01B/MX268x01B.

Spurious Emission (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Spot Table	RBW Mode	Auto	TBLRBWMD_SPU SPOT,AUTO	TBLRBWMD_SPU? SPOT	AUTO	
		Manual	TBLRBWMD_SPU SPOT,MAN		MAN	
	RBW Type	Normal	TBLRBWTP_SPU SPOT,NRM	TBLRBWTP_SPU? SPOT	NRM	
		Digital	TBLRBWTP_SPU SPOT,DGTL		DGTL	
	VBW		TBLVBW_SPU SPOT,Fn,f	TBLVBW_SPU? SPOT,Fn	f	n: 1 to 15 f: 1 Hz to 3 MHz (1 – 3 sequence), Off
	VBW Mode	Auto	TBLVBWMD_SPU SPOT,AUTO	TBLVBWMD_SPU? SPOT	AUTO	
		Manual	TBLVBWMD_SPU SPOT,MAN		MAN	
	RBW / VBW Ratio		TBLVBWRT_SPU SPOT,r	TBLVBWRT_SPU? SPOT	r	r: 0.0001 to 100
	SWT		TBLSWT_SPU SPOT,Fn,ta	TBLSWT_SPU? SPOT,Fn	tb	t: 10 ms to 1000 s
	SWT Mode	Auto	TBLSWTMD_SPU SPOT,AUTO	TBLSWTMD_SPU? SPOT	AUTO	
		Manual	TBLSWTMD_SPU SPOT,MAN		MAN	
	Limit		SPULMT SPOT,Fn,l	SPULMT? SPOT,Fn	l	
		Rel	SPULMT SPOT, Fn,l,REL	SPULMT? SPOT,Fn,REL,	l	*1
		Abs	SPULMT SPOT,Fn,l,ABS,	SPULMT? SPOT,Fn,ABS,	l	*1
	Judge Unit		JUDGUNIT_SPTBL s	JUDGUNIT_SPTBL?	s	*1
			JUDGUNIT_SPTBL ABS		ABS	
			JUDGUNIT_SPTBL REL		REL	
			JUDGUNIT_SPTBL RELABS		RELABS	
	Split Sweep	On	SPLITSWP_SPU ON	SPLITSWP_SPU?	ON	
		Off	SPLITSWP_SPU OFF		OFF	
	View	RBW, VBW, SWT	TBLVIEW_SPU SPOT,BWSWT	TBLVIEW_SPU? SPOT	BWSWT	
		Ref Level Attenuator	TBLVIEW_SPU SPOT,REFATT		REFATT	
		Limit	TBLVIEW_SPU SPOT,LMT		LMT	

*1: Available only for MX860x01B/MX268x01B.

Spurious Emission (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Search and Sweep Table	Start Frequency		TBLFREQ_SPU START,Fn,f	TBLFREQ_SPU? START,Fn	f	n: 1 to 15 f: 1 kHz to 7899.999 MHz
	Start Frequency Cancel		TBLFREQ_SPU START, Fn, 0	TBLFREQ_START,Fn	0	n: 1 to 15
	Stop Frequency		TBLFREQ_SPU STOP,Fn,f	TBLFREQ_SPU? STOP,Fn	f	n: 1 to 15 f: 2 kHz to 7900.000 MHz
	Stop Frequency Cancel		TBLFREQ_SPU STOP,Fn,0	TBLFREQ_SPU? STOP,Fn	0	n: 1 to 15
	Attenuator Ref Level Mode	Auto	TBLATTRLMD_SPU SWEEP,AUTO	TBLATTRLMD_SPU? SWEEP	AUTO	
		Manual	TBLATTRLMD_SPU SWEEP,MAN		MAN	
	Attenuator Mode	Auto	TBLATTMD_SPU SWEEP,AUTO	TBLATTMD_SPU? SWEEP	AUTO	
		Manual	TBLATTMD_SPU SWEEP,MAN		MAN	
	Ref Level		TBLRL_SPU SWEEP,Fn,l	TBLRL_SPU? SWEEP,Fn	l	n: 1 to 15
	Attenuator		TBLATT_SPU SWEEP,Fn,l	TBLATT_SPU? SWEEP,Fn	l	n: 1 to 15
	RBW		TBLRBW_SPU SWEEP,Fn,f	TBLRBW_ SPU? SWEEP,Fn	f	n: 1 to 15 f: 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 3 MHz, 5 MHz, 10 MHz, 20 MHz
	RBW Mode	Auto	TBLRBWMD_SPU SWEEP,AUTO	TBLRBWMD_SPU? SWEEP	AUTO	
		Manual	TBLRBWMD_SPU SWEEP,MAN		MAN	
	RBW Type	Normal	TBLRBWTP_SPU SWEEP,NRM	TBLRBWTP_ SPU? SWEEP	NRM	
		Digital	TBLRBWTP_SPU SWEEP,DGTL		DGTL	
	VBW		TBLVBW_SPU SWEEP,Fn,f	TBLVBW_ SPU? SWEEP,Fn	f	n: 1 to 15
	VBW Mode	Auto	TBLVBWMD_SPU SWEEP,AUTO	TBLVBWMD_SPU? SWEEP	AUTO	
		Manual	TBLVBWMD_SPU SWEEP,MAN		MAN	
	RBW/VBW Ratio		TBLVBWRT_SPU SWEEP,r	TBLVBWRT_ SPU? SWEEP	r	
	SWT		TBLSWT_SPU SWEEP,Fn,ta	TBLSWT_SPU? SWEEP,Fn	tb	n: 1 to 15

Spurious Emission (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Search and Sweep Table	SMT Mode	Auto	TBLSWTMD_SPU SWEEP,AUTO	TBLSWTMD_SPU? SWEEP	AUTO	
		Manual	TBLSWTMD_SPU SWEEP,MAN		MAN	
	Limit		SPULMT SWEEP,Fn,l	SPULMT? SWEEP,Fn	l	
		Rel	SPULMT SWEEP,Fn,l,REL	SPULMT? SWEEP, Fn,REL,	l	*1
		Abs	SPULMT SWEEP,Fn,l,ABS	SPULMT? SWEEP,Fn,ABS	l	
	Judge Unit		JUDGUNIT_SWTBL ON	JUDGUNIT_ SWTBL?	ON	*1
			JUDGUNIT_SWTBL OFF		OFF	
			JUDGUNIT_ SWTBL ABS		ABS	
			JUDGUNIT_ SWTBL REL		REL	
			JUDGUNIT_ SWTBL RELABS		RELABS	
	View	RBW, VBW, SWT	TBLVIEW_SPU SWEEP,BWSWT	TBLVIEW_ SPU? SWEEP	BWSWT	
		Ref Level,Att enuator	TBLVIEW_SPU SWEEP,REFATT		REFATT	
		Limit	TBLVIEW_SPU SWEEP,LMT		LMT	
Adjust Range			ADJRNG	—	—	
Power Calibration			PWRCAL	PWRCAL?	l	l: –10.00 to 10.00 dB *2
Multi Carrier Calibration			MLTCARRCAL	—	—	
Load Multi Carrier Calibration			LOADMLTCALDATA	—	—	*1, *3
Write Multi Carrier Caribration			WRTMLTCALDATA	—	—	*1, *3
Calibration Cancel			CALDANCEL	—	—	
Calibration Value			CALVAL l	CALVAL?	n,l	n: mode (0: Not calibrated, 1: Internal calibrated, 2: External writing 3: Internal calibrated (Multi Carr.Cal) l: –10.00 to 10.00 dB)
Marker Position			MKP_SPU n	MKP_SPU?	n	n: 0 to 500 *1
Marker Level			MKL_SPU Fna,nb,u	MKL_SPU? Fna,nb,u	l	na: 1 to 15 nb:0,1 u: DB,DBM

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: Available only when MX8609A-33 is installed.

Spurious Emission (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Result	Tx Power	—	TXPWR? u		u: DBM or WATT
	Frequency	—	SPUFREQ? Fna,nb	f(1),f(2),…, f(nb)	na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results)
	Level	—	SPULVL? Fna,nb	l(1),l(2),…, l(nb)	na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results)
			SPULVL? Fna,nb,u		na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results) u; DBM, DB
	Frequency and Level	—	SPUFREQLVL? Fna,nb	f(1),l(1),f(2),l(2),…, f(nb),l(nb)	na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results)
		—	SPUFREQLVL? Fa,nb,u		na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results) u; DBM, DB
	Ref Level	—	SPURL? Fna,nb	l(na),l(na+1),…, l(na+nb)	
	Attenuator	—	SPUATT? Fna,nb	l(na),l(na+1),…, l(na+nb)	
	RBW	—	SPURBW? Fna,nb	f(na),f(na+1),…, f(na+nb)	
	WBW	—	SPUVBW? Fna,nb	f(na),f(na+1),…, f(na+nb)	
	Sweep Time	—	SPUSWT? Fna,nb	f(na),f(na+1),…, f(na+nb)	
	Judge Level	—	SPUJUDGLVL? Fna,nb	nc,nd	na: 1 to 15 (read-starting frequency table Number) nb: 1 to 15 (number of reading results) *1

*1:Available only for MX860x01B/MX268x01B.

Spurious Emission (continued.)

Function	Item		Program Message	Query Message	Response Message	Remarks
Measure Result	All		—	SPUALL? Fna,nb,u	fa(na),la(na), lb(na),lc(na), fb(na),fc(na), t(na),..., fa(na+nb), la(na+nb), lb(na+nb), lc(na+nb), fb(na+nb), fc(na+nb), t(na+nb)	
	Judgment		—	SPUPASS? Fn	jn	
		All		SPUPASS? ALL	j1,j2,…,j15	
	Total Judgement		—	SPUJDG?	j	
Wave Data	Time Domain		XMGT Fna,nb,nc	XMGT? Fna,nd,ne	f(1),f(2),..., f(nd)	na: 1 to 15 (read-starting frequency table nunber) nb: 0 to 500 (write address for data) nc: -32768 to 32767 (write data) nd 0 to 500 (read address for data) ne: 1 to 501 (number of reading data) *1
	Frequency Domain		XMG Fna,nb,nc	XMG? Fna,nd,ne	f(1),f(2),...,f(nd)	

*1: Available only for MX860x01B/MX268x01B

Power Meter

The list below shows the correspondence between the external commands and the reading of the setting items measured results on the Power Meter screen.

These commands are valid only when this unit is MS860x.

Function	Item	Program Message	Query Message	Response Message	Remarks
Zero Set		ZEROSET	—	—	
		ZAJ	—	—	
Adjust Range		ADJRNG	—	—	
Range Up		RNG UP	—	—	
Range Down		RNG DN	—	—	
Range1		RNG1	—	—	
Range2		RNG2	—	—	
Range3		RNG3	—	—	
Range4		RNG4	—	—	
Range5		RNG5	—	—	
Set Relative		SETREL	—	—	
Measure Result	Power	—	POWER? DBM	l	
		—	POWER? WATT	l	
		—	POWER? DB	l	

IQ Level

The list below shows the correspondence between the external commands and the reading of the setting items on the IQ Level screen.
For MS268x, these commands are available when Option-17, 18 is installed.

Function	Item		Program Message	Query Message	Response Message	Remarks
Storage Mode	Normal		STRG_IQL NRM	STRG_IQL?	NRM	
	Average		STRG_IQL AVG		AVG	
Average count			AVR_IQL n	AVR_IQL?	n	n: 2 to 9999
Refresh Interval	Every		INTVAL_IQL EVERY	INTVAL_IQL?	EVERY	
	Once		INTVAL_IQL ONCE		ONCE	
Unit	mV		UNIT_IQL MV	UNIT_IQL?	MV	
	dBmV		UNIT_IQL DBMV		DBMV	
Measure Result	Level	All	—	IQLVL?	la,lb,lc,ld	la: I Level(rms) lb: Q Level(rms) lc: I p-p ld: Q p-p
			—	IQLVL? MV		
			—	IQLVL? DBMV		
		I (rms)	—	ILVL?	l	
			—	ILVL? MV		
			—	ILVL? DBMV		
		Q (rms)	—	QLVL?	l	
			—	QLVL? MV		
			—	QLVL? DBMV		
		I p-p	—	IPPLVL?		
			—	IPPLVL? MV		
			—	IPPLVL? DBMV		
		Q p-p	—	QPPLVL?		
			—	QPPLVL? MV		
			—	QPPLVL? DBMV		
	I/Q Phase difference		—	IQPHASE?	r	unit: deg

Demodulation Data

The list below shows the correspondence between the external commands and the reading of the setting items and measured results on the Demodulation Data screen

Function	Item	Program Message	Query Message	Response Message	Remarks
Demodulation Phase	I	DEMODPHASE I	DEMODPHASE?	I	
	Q	DEMODPHASE Q		Q	
Spreading Factor		SF_DEMOD n	SF_DEMOD?	n	n: 512 (Down Link), 256, 128, 64, 32, 16, 8, 4
Channelization Code		SCNO_DEMOD n	SCNO_DEMOD?	n	n: 0 to (Spreading Factor – 1)
Rotation		ROTATION	—	—	
Pilot Symbol Sync	On	PSSYNC_DEMOD ON	PSSYNC_DEMOD?	ON	
	Off	PSSYNC_DEMOD OFF		OFF	
Display Page		PAGE_DEMOD n	PAGE_DEMOD?	n	n: 1 to 80(Down Link) 40(Up Link)
Timing Offset		TIMINGOFS_DEMOD n	TIMINGOFS_ DEMOD?	n	n: 0 to 150 chip
Adjust Range		ADJRNG	—	—	
Power Calibration		PWRCAL	PWRCAL?	l	l: –10.00 to 10.00 dB *1
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCARDATA	—	—	*1, *3
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *3
Calibration Cansel		CALCANCEL	—	—	
Calibration Value		CALVAL l	CALVAL?	n,l	n: mode (0: Uncalibrated 1: Internal caribrated 2: External writing 3. Internal caribrated (Multi Carr.Cal) l: –10.00 to 10.00 dB
Marker Position		MKPSLT_DEMOD n	MKPSLT_DEMOD?	n	n: 1 to (Demodulation Frame * 15) *2
Operation Trace	Demodulation	OPRTTR_DEMOD DEMOD	OPRTTR_DEMOD?	DEMOD	*2
	Code vs Time	OPRTTR_DEMOD CDVSTM		CDVSTM	
CF Marker Mode	Auto	CFMKR_DEMOD AUTO	CFMKR_DEMOD?	AUTO	*2
	Manual	CFMKR_DEMOD MAN		MAN	

*1: Valid only when this unit is MS860x.

*2: Available only for MX860x01B/MX268x01B.

*3: Available only when MS8609A-33 is installed.

Demodulation Data (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Setup Channel Data		SETCH_DEMOD na,nb,nc	SETCH_DEMOD?	na,nb	na:Channelization Code nb: Spreading Factor nc: <Up Link> 1(I) 2(Q) <Down Link> 1 <Down Link (Compress)> 1 (Normal Frame) 2 (Compressed Frame) *2
Demodulate Channel	Normal Frame	DEMODCHAN_DEMOD NF	DEMODCHAN_DEMOD ?	NF	*1
	Compressed Frame	DEMODCHAN_DEMOD CF		CF	
Marker Data		—	MKDEMOD?	r	r: 0 to 65535 *1
	Decimal	—	MKDEMOD? DEC	r	r: 0 to 65535 *1
	Hexadecimal	—	MKDEMOD? HEX	h	h: 0 to FFFF
Marker Position		MRP_DEMOD r	MKP_DEMOD?	r	r: 0 to (Demodulation Length – 1) *1
Slot Demodulation Output	Decimai	—	SLT_DEMOD? na,nb,DEC,c	l	na: 1 to (Demodulation Frame *15) nb: 1 to ((Demodulation Frame *15) – a +1) c: 0 or 1 l: 0 to 65535 *1
	Hexadecimal	—	SLT_DEMOD? na,nb,HEX,c	h	na: 1 to (Demodulation Frame *15) nb: 1 to ((Demodulation Frame *15) – a +1) c: 0 or 1 h: 0 to FFFF *1
Scrambling Code Result		—	SCCODENO_DEMOD? SCCODENO_DEMOD? NF SCCODENO_DEMOD? CF	h	<Up Link> h: 000000 to FFFFFF <Down Link> h: 000000 to 3FFFF *1

*1: Available only for MX860x01B/MX268x01B.

Demodulation Data (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Code vs Time		---	SLTCDPWR_DEMOD? na,nb	la,lb	na: <Up Link> 0: Total,1: I Channel 2: Q Channel nb: Slot Number la: Relative Power lb: Absolute Power <Down Link> 0: Total,1: Channel <Down Link(Compress)> 0: Total,1: NF Channel 2: CF Channel*1
		---	SLTCDPWR_DEMOD? na,nb, REL	la	
		---	SLTCDPWR_DEMOD? na,nb, ABS	lb	
Compressed Frame Scramble Code	Ordinary	CFSC_DEMOD ORD	CFSC_DEMOD?	ORD	Compressed Frame Marker Mode: Auto *1
	Alternative	CFSC_DEMOD ALTN		ALTN	
	Ordinary	CFSC_DEMOD ORD		ORD	Compressed Frame Marker Mode:Manual *1
	Left Alternative	CFSC_DEMOD LALTN		LALTN	
	Right Alternative	CFSC_DEMOD RALTN		RALTN	
Frame Demodulation Output	On	FRMDM ON	FRMDM?	ON,1	
		FRMDM ON,n		ON,n	n: 1 to 10
	Off	FRMDM OFF		OFF,0	
Refresh Wave Memory	On	TAKEWAVE ON	TAKEWAVE?	ON	
	Off	TAKEWAVE OFF		OFF	
Write Demodulation Data down to the PC Card		WRDATA_DEMOD a	—	—	a: Hex or Bin
Demodulation Data	Dec	XMM na,nb	XMM? nc,nd	ne(1),ne(2),…,ne(nd)	na: 0 to 11999 (write address for data) nb: –32768 to 32767 (write data) nc: 0 to 11999 (read-start address for data) nd: 1 to 12000 (number of reading points) ne: –32768 to 32767
	Hex	XMMH na,ha	XMMH? nc,nd	hb(1),hb(2),…,hb(nd)	na: 0 to 11999 (write address for data) ha: 0 to FFFF(write data) nc: 0 to 11999 (read-start address for data) nd: 1 to 12000(number of reading points) hb: 0 to FFFF (read data)

*1: Available only for MX860x01B/MX268x01B.

Demodulation Data (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Closed Loop Mode	Off	CLOOP_DEMOD OFF	CLOOP_DEMOD?	OFF	*1
	Mode 1	CLOOP_DEMOD MODE1	CLOOP_DEMOD?	MODE1	
	Mode 2	CLOOP_DEMOD MODE 2	CLOOP_DEMOD?	MODE2	
Slot Format	0	SLTFORMAT_DEMOD 0	SLTFORMAT_DEMOD?	0	*1
	1	SLTFORMAT_DEMOD 1	SLTFORMAT_DEMOD?	1	
	2	SLTFORMAT_DEMOD 2	SLTFORMAT_DEMOD?	2	
	3	SLTFORMAT_DEMOD 3	SLTFORMAT_DEMOD?	3	
	4	SLTFORMAT_DEMOD 4	SLTFORMAT_DEMOD?	4	
	5	SLTFORMAT_DEMOD 5	SLTFORMAT_DEMOD?	5	
	6	SLTFORMAT_DEMOD 6	SLTFORMAT_DEMOD?	6	
	7	SLTFORMAT_DEMOD 7	SLTFORMAT_DEMOD?	7	
	8	SLTFORMAT_DEMOD 8	SLTFORMAT_DEMOD?	8	
	9	SLTFORMAT_DEMOD 9	SLTFORMAT_DEMOD?	9	
	10	SLTFORMAT_DEMOD 10	SLTFORMAT_DEMOD?	10	
	11	SLTFORMAT_DEMOD 11	SLTFORMAT_DEMOD?	11	
	12	SLTFORMAT_DEMOD 12	SLTFORMAT_DEMOD?	12	
	13	SLTFORMAT_DEMOD 13	SLTFORMAT_DEMOD?	13	
	14	SLTFORMAT_DEMOD 14	SLTFORMAT_DEMOD?	14	
	15	SLTFORMAT_DEMOD 15	SLTFORMAT_DEMOD?	15	
	16	SLTFORMAT_DEMOD 16	SLTFORMAT_DEMOD?	16	

*1: Available only for MX860x01B/MX268x01B.

Demodulation Data (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
CF Slot Format	0A	CFSLTFORM_DEMOD 0A	CFSLTFORM_DEMOD?	0A	
	2A	CFSLTFORM_DEMOD 2A	CFSLTFORM_DEMOD?	2A	
	3A	CFSLTFORM_DEMOD 3A	CFSLTFORM_DEMOD?	3A	
	4A	CFSLTFORM_DEMOD 4A	CFSLTFORM_DEMOD?	4A	
	5A	CFSLTFORM_DEMOD 5A	CFSLTFORM_DEMOD?	5A	
	6A	CFSLTFORM_DEMOD 6A	CFSLTFORM_DEMOD?	6A	
	7A	CFSLTFORM_DEMOD 7A	CFSLTFORM_DEMOD?	7A	
	8A	CFSLTFORM_DEMOD 8A	CFSLTFORM_DEMOD?	8A	
	9A	CFSLTFORM_DEMOD 9A	CFSLTFORM_DEMOD?	9A	
	10A	CFSLTFORM_DEMOD 10A	CFSLTFORM_DEMOD?	10A	
	11A	CFSLTFORM_DEMOD 11A	CFSLTFORM_DEMOD?	11A	
	12A	CFSLTFORM_DEMOD 12A	CFSLTFORM_DEMOD?	12A	
	13A	CFSLTFORM_DEMOD 13A	CFSLTFORM_DEMOD?	13A	
	14A	CFSLTFORM_DEMOD 14A	CFSLTFORM_DEMOD?	14A	
	15A	CFSLTFORM_DEMOD 15A	CFSLTFORM_DEMOD?	15A	
	16A	CFSLTFORM_DEMOD 16A	CFSLTFORM_DEMOD?	16A	
	0B	CFSLTFORM_DEMOD 0B	CFSLTFORM_DEMOD?	0B	
	1B	CFSLTFORM_DEMOD 1B	CFSLTFORM_DEMOD?	1B	
	2B	CFSLTFORM_DEMOD 2B	CFSLTFORM_DEMOD?	2B	
	3B	CFSLTFORM_DEMOD 3B	CFSLTFORM_DEMOD?	3B	
	4B	CFSLTFORM_DEMOD 4B	CFSLTFORM_DEMOD?	4B	
	5B	CFSLTFORM_DEMOD 5B	CFSLTFORM_DEMOD?	5B	
	6B	CFSLTFORM_DEMOD 6B	CFSLTFORM_DEMOD?	6B	
	7B	CFSLTFORM_DEMOD 7B	CFSLTFORM_DEMOD?	7B	
	8B	CFSLTFORM_DEMOD 8B	CFSLTFORM_DEMOD?	8B	
	9B	CFSLTFORM_DEMOD 9B	CFSLTFORM_DEMOD?	9B	
	10B	CFSLTFORM_DEMOD 10B	CFSLTFORM_DEMOD?	10B	
	11B	CFSLTFORM_DEMOD 11B	CFSLTFORM_DEMOD?	11B	
	12B	CFSLTFORM_DEMOD 12B	CFSLTFORM_DEMOD?	12B	
	13B	CFSLTFORM_DEMOD 13B	CFSLTFORM_DEMOD?	13B	
	14B	CFSLTFORM_DEMOD 14B	CFSLTFORM_DEMOD?	14B	
	15B	CFSLTFORM_DEMOD 15B	CFSLTFORM_DEMOD?	15B	

Spectrum Emission Mask

The list below shows the correspondence between the extern the control commands and the reading of the setting items and measured results on the Spectrum Emission Mask screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Detect Mode	Positive Peak	DET_SMASK POS	DET_SMASK?	POS	
	Sample	DET_SMASK SMP		SMP	
	Negative Peak	DET_SMASK NEG		NEG	
	Average	DET_SMASK AVG		AVG	
	RMS	DET_SMASK RMS		RMS	
Storage Mode	Normal	STRG_SMASK NRM	STRG_SMASK?	NMR	
	Average	STRG_SMASK AVG		AVG	
Average Count		AVR_SMASK n	AVR_SMASK?	n	n: 2 to 9999
Refresh Interval	Every	INTVAL_SMASK EVERY	INTVAL_SMASK?	EVERY	
	Once	INTVAL_SMASK ONCE		ONCE	
Unit	dBm	UNIT_SMASK DBM	UNIT_SMASK?	DBM	
	mW	UNIT_SMASK MD		MW	
	μW	UNIT_SMASK UD		UW	
	nW	UNIT_SMASK ND		NW	
	dB	UNIT_SMASK DB		DB	
Ref Level		RL_SMASK l	RL_SMASK?	l	
Attenuator Ref Level Mode	Auto	ATTRLMD_SMASK AUTO	ATTRLMD_SMASK?	AUTO	
	Manual	ATTRLMD_SMASK MAN		MAN	
Attenuator		ATT_SMASK l	ATT_SMASK?	l	
Attenuator Mode	Auto	ATTMD_SMASK AUTO	ATTMD_SMASK?	AUTO	
	Manual	ATTMD_SMASK MAN		MAN	
Frequency Offset		TEMPLVL_SMASK n,l	TEMPLVL_SMASK? n		
Sweep Time		SWT_SMASK t	SWT_SMASK?	t	
Sweep Time Mode	Manual	STM_SMASK MAN	STM_SMASK?	MAN	
	Auto	STM_SMASK AUTO		AUTO	
RBW Type	Normal	RBD_SMASK NRM	RBD_SMASK?	NRM	
	Digital	RBD_SMASK DGTL		DGTL	

*1: Available only for MX860x01B/MX268x01B.

Spectrum Emission Mask (Continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
VBW Mode	Manual	VBM_SMASK MAN	VBM_SMASK?	MAN	
	Auto	VBM_SMASK AUTO		AUTO	
VBW/RBW Ratio		VBR_SMASK l	VBR_SMASK?	l	l: 0.0001 to 100
VBW		VBW_SMASK n	VBW_SMASK?	n	n: 0 (OFF) to 3000000
Display Data Type	Level	DISPTYPE_SMASK LVL	DISPTYPE_SMASK?	LVL	
	Margin	DISPTYPE_SMASK MARGIN		MARGIN	
Filter Power	Tx Power	FLTTYPE_SMASK TXPOWER	FLTTYPE_SMASK?	TXPOWER	
	Filtered Power	FLTTYPE_SMASK RRCFILTER		RRCFILTER	
Template Power		TEMPPWR_SMASK l	TEMPPWR_SMASK?	l	l: −100.0 to 100.0
Template Condition	Standard	SLCTTEMP_SMASK STD	SLCTTEMP_SMASK?	STD	
	Not Selected	---		NOT	
Template Type	Up Link	TEMPTYPE_SMASK UPLNK	TEMPTYPE_SMASK?	UPLNK	
	Down Link (P>=43 dBm)	TEMPTYPE_SMASK DNLNK1		DNLNK1	*1
	Down Link (39<=P<43 dBm)	TEMPTYPE_SMASK DNLNK2		DNLNK2	*1
	Down Link (31<=P<39 dBm)	TEMPTYPE_SMASK DNLNK3		DNLNK3	*1
	Down Link (P<31 dBm)	TEMPTYPE_SMASK DNLNK		DNLNK	*1
Adjust Range		ADJRNG	—	—	
Power Calibration		PWRCAL	PWRCAL?	l	l: −10.00 to 10.00 dB *2
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCALDATA	—	—	*1, *3
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *3
Calibration Cancel		CALCANCEL	—	—	
Calibration Value		CALVAL l	CALVAL?	n,l	n:mode (0: Uncaliblated 1: Internal calibrated 2: External writing 3: Internal calibrated (Multi Carr.Cal) l: −10.00 to 10.00 dB
Marker Mode	Normal	MKR_SMASK NRM	MKR_SMASK?	NRM	
	Off	MKR_SMASK OFF		OFF	

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: Available only when MS8609A-33 is installed.

Spectrum Emission Mask (Continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Marker Position	Point	MKP_SMASK n	MKP_SMASK?	n	n: 0 to 798 (Up Link) 0 to 840 (Down Link)
	Frequency	MKRS_SMASK f	MKRS_SMASK?	f	f: –12.5 to 12.5 MHz
		MKN_SMASK f	MKN_SMASK?	f	f: –12.5 to 12.5 MHz
	Digital	RBD_SMASK DGTL	RBD_SMASK?	DGTL	
Marker Level		—	MKL_SMASK? u	l	u: DB,DBM,WATT
Tx Power		—	TXPWR? u	l	u: DBM,WATT
Span Width		—	FSPAN_SMASK?	f	
Peak Data		—	PEAK_SMASK? Ln,u	l,PASS	n: 1 to 4 (Up Link) 1 to 5 (Down Link) u:DB,DBM,W,MW,UW,NW
			PEAK_SMASK? Un,u		
			PEAK_SMASK? PEAK,u	l,FAIL	
			PEAK_SMASK? ALL,u		
Template Judgment		—	TEMPPASS_SMASK?	PASS or FAIL	
Wave Data		XMFN na,nb	XMFN? nc,nd	ne	na: 0 to 2400 (write address for data) nb: –32768 to 32767 (write data of a 16-bit waveform) nc: 0 to 2400 (read-start address for data) nd: 1 to 2401 (number of reading address) ne: –32768 to 32767 (read data of a 16-bit waveform)

CCDF

The list below shows the correspondence between the external commands and the reading of the setting items on the CCDF screen.

Function	Item	Program Message	Query Message	Response Message	Remarks
Measure Method	CCDF	DSPL CCDF,CCDF	DSPL?	CCDF,CCDF	*1
	APD	DSPL CCDF,APD		CCDF,APD	
Trace Format	Positive	TRFORM_CCDF POS	TRFORM_CCDF?	POS	*1
	Negative	TRFORM_CCDF NEG		NEG	
	Positive & Negative	TRFORM_CCDF POSNEG		POSNEG	
Horizontal Scale	2 dB	HSCALE_CCDF 2	HSCALE_CCDF?	2	*1
	5 dB	HSCALE_CCDF 5		5	
	10 dB	HSCALE_CCDF 10		10	
	20 dB	HSCALE_CCDF 20		20	
	50 dB	HSCALE_CCDF 50		50	
Display Data Type	Probability	DISPTYPE_CCDF PROB	DISPTYPE_CCDF?	PROB	*1
	Distribution	DISPTYPE_CCDF DSTRBT		DSTRBT	
Reference Trace	Off	REFTR_CCDF OFF	REFTR_CCDF?	OFF	*1
	Save	REFTR_CCDF SAVE		SAVE	
	Gaussian	REFTR_CCDF GAUSS		GAUSS	
	Save & Gaussian	REFTR_CCDF SAVEGAUSS		SAVEGAUSS	
Save Trace		SAVETR_CCDF	—	—	*1
Filter Type	20 MHz	RBW_CCDF 20MHZ	RBW_CCDF?	20MHZ	*1
	10 MHz	RBW_CCDF 10MHZ		10MHZ	
	5 MHz	RBW_CCDF 5MHZ		5MHZ	
	3 MHz	RBW_CCDF 3MHZ		3MHZ	
	3.84 MHz (RRC)	RBW_CCDF RRC		RRC	
	3.84 MHz (RC)	RBW_CCDF RC		RC	
Data Count		DCOUNT_CCDF n	DCOUNT_CCDF?	n	n: 10000 to 2000000000 *1
Analysis Length		ANLYLEN_CCDF t	ANLYLEN_CCDF?	t	t:1 to 100000 *1
Marker Mode	Off	MKR_CCDF OFF	MKR_CCDF?	OFF	*1
	Normal	MKR_CCDF NRM		NRM	
Adjust Range		ADJRNG	—	—	*1

*1: Available only for MX860x01B/MX268x01B.

CCDF (continued.)

Function	Item	Program Message	Query Message	Response Message	Remarks
Power Calibration		PWRCAL	PWRCAL?	l	l: −10.00 to 10.00 dB *1, *2
Multi Carrier Calibration		MLTCARRCAL	—	—	
Load Multi Carrier Calibration		LOADMLTCALDATA	—	—	*1, *3
Write Multi Carrier Calibration		WRTMLTCALDATA	—	—	*1, *3
Calibration Cancel		CALCANCEL	—	—	*1
Calibration Cancel		CALVAL l	CALVAL?	n,l	n: mode (0: Uncalibrated 1: Internal calibrated 2: External writing) 3: Internal calibrated (Multi Carr.Cal) l: −10.00 to 10.00 dB *1
Power		—	POWER_CCDF?	la,lb,lc,ld,le	*1
Power at x %		—	PROBPWR_CCDF?	la,lb,lc,ld,le,lf	*1
Distribution at grid		—	PWRPROB_CCDF?	la,lb,lc,ld,le	*1
Marker Mode	Normal	MKR_CCDF NRM	MKR_CCDF?	NRM	*1
	Off	MKR_CCDF OFF		OFF	
Marker Positon		MKP_CCDF a	MKP_CCDF?	a	a: 0.0001 to 100.000 (probability) −50.00 to 50.00 (distribution) *1
Marker Level		—	MKL_CCDF? n, PROB	la	n: 0,1 *1
		—	MKL_CCDF? n, DSTRBT	lb	n: 0,1 *1
		—	MKL_CCDF? ALL,PROB	la,lc,ld	*1
		—	MKL_CCDF? ALL,DSTRBT	lb,le,lf	*1
Delta Marker		—	DELTAMKR_CCDF?	l	*1
Wave Data		—	CCDFDSTRBT? la,lb,lc	ld	la: −50.0 to 50.0 (CCDF) 0.0 to 50.0 (APD) lb: 1 to 1001 (CCDF) 1 to 501 (APD) lc: 0,1,2 *1

*1: Available only for MX860x01B/MX268x01B.

*2: Valid only when this unit is MS860x.

*3: Available only when MS8609A-33 is installed.

Section 7 Detailed Explanations of Commands

This section provides the detailed explanation of the external control commands which can be used by the W-CDMA Measurement Software, in alphabetical order.

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ATTMD_ADJ 7-27
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Detailed Explanation of External Control Commands in Alphabetical Order

This section provides the detailed specifications of the external control commands in alphabetical order. See Section 6 “Command List” to search a command for a desired function.

■ Description of the detailed explanation for each command

[1] CHAN

[2] ■ Function

Channel

Sets a channel.

[3] ■ Syntax

Program Message	Query Message	Response Message
CHAN *ch*	CHAN?	*ch*

[4] ■ Parameter

ch

Channel

Range	Resolution	Initial value
0 to 20000	1	9600

[5] ■ Restrictions

- The “Terminal” must be set to “RF” before hand (*cf.* TERM).
- If the Frequency falls outside the specified setting range due to the Channel Spacing value, the Channel cannot be changed even within the specified channel setting range. (*cf.* CHSPC)

[6] ■ Initialization command

*RST

[7] ■ Use examples

Sets the channel to 5.

<Program>

TERM RF

CHAN 5

CHAN?

<Response>

5

[1] A command name. In this section, the command name is taken from the header of each device message.

[2] ■ Function: The command for setting the Tx Power is the function of the Program Message, while the command for reading out the measured results is the function of the Response Message.

[3] ■ Syntax: Shows how to create a device message. A single space character comes between the message header and parameter (shown in italics).

[4] ■ Parameter: Shows the meaning for the device message argument.
The character string shown in the “Value” field is substituted for the parameter during item setting.
Likewise, the numeric value shown in the “Range” field is substituted for the parameter during numeric setting.
“Resolution” shows a step value set for both the program message and the query message, or shows the resolution of the measured results for the response message.

[5] ■ Restrictions: Shows the precautions in using the command. The restrictions concern commands marked “*Cf.*”.

[6] ■ Initialization command: Shows the command that initializes the item targeted to be set by this command.

[7] ■ Use example: Shows the basic order for this command’s use. The value of <Response> shown in the command example which reads out the measured result is different from an actual value.

ACPALL

■ Function

Adjacent Channel Power

When Measure Method is set to SPA (All) or SPA (Separate), reads both the measured results weighted by the RRC filter and those not weighted by it during Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	ACPALL? *a*	*c,d*
---	ACPALL? *a, b*	*c,d*
---	ACPALL? ALL	*e,f,g,h,i,j,k,l*
---	ACPALL? ALL, *b*	*e,f,g,h,i.j,k,l*

■ Value of a

Offset frequency

Value	Offset Frequency
LOW2	−10.00 MHz
LOW1	−5.00 MHz
UP1	5.00 MHz
UP2	10.00 MHz

■ Value of b

Output unit

Value	Output unit
None	Depends on current set value (*cf.* UNIT_ADJ)
DB	dB
DBM	dBm
MW	mW
UW	uW
NW	nW

■ Value of c

Power resolution unit at the frequency set for a:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of d

Power resolution unit that us weighted by the RRC filter at the frequency set for a:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of e

Power resolution unit at −10.00MHz.

Resolution	Unit
0.01	Depends on the value for b.

■ Value of f

Power resolution unit that is weighted by the RRC Filter at −10.00MHz.

Resolution	Unit
0.01	Depends on the value for b.

■ Value of g

Power resolution unit at −5.00MHz

Resolution	Unit
0.01	Depends on the value for b.

■ Value of h

Power resolution unit that is weighted by the RRC filter at −5.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of i

Power resolution unit at 10.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of j

Power resolution unit that is weighted by the RRC Filter at 10.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of k

Power resolution unit at 5.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of l

Power resolution unit that us weighted by the RRC filter at 5.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Restrictions

None

■ Use example

To read Power that is weighted by the RRC Filter:

<Program>

DSPL ADJ,SPECT1

SWP

ACPALL? UP2,DB

<Response>

−1.63

ACPRRC

■ Function

Adjacent Channel Power with Root Raised Cosine Filtering.
When Measure Method is set to SPA (All) or SPA (Separate), reads the measured results weighted by the RRC filter during Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	ACPRRC? *a*	*c*
---	ACPRRC? *a, b*	*c*
---	ACPRRC? ALL	*d,e,f,g*
---	ACPRRC? ALL, *b*	*d,e,f,g*

■ Value of a

Offset frequency

Value	Offset Frequency
LOW2	−10.00 MHz
LOW1	−5.00 MHz
UP1	5.00 MHz
UP2	10.00 MHz

■ Value of b

Output unit

Value	Output unit
None	Depends on current set value (*cf.* UNIT_ADJ)
DB	dB
DBM	dBm
MW	mW
UW	μW
NW	nW

■ Value of c

Power resolution unit at the frequency set for a:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of d

Power resolution unit at −10.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of e

Power resolution unit at −5.00MHz.

Resolution	Unit
0.01	Depends on the value for b.

■ Value of f

Power resolution unit at 10.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Value of g

Power resolution unit at 5.00MHz:

Resolution	Unit
0.01	Depends on the value for b.

■ Restrictions

None

■ Use example

To read Power at 10.00MHz in dB unit:

<Program>

```
DSPL ADJ,SPECT1
SWP
ACPRRC? UP2,DB
```

<Response>

−1.63

ADJCH

■ Function

Adjacent Channel Power measurement, outputs the measured results by for Adjacent Channel Power Offset or that Filtered Power or Leakage Power due to Modulation when the measuring method select is Spectrum or Modulation, respectively.
This command functions the same as the CHPWR command.

■ Syntax

Program Message	Query Message	Response Message
---	ADJCH?	*filteredpower*
---	ADJCH? *offset*	*offsetpower*
---	ADJCH? *offset,unit*	*offsetpower*
---	ADJCH? ALL	*low2,low1,up2,up1*
---	ADJCH? ALL,*unit*	*low2,low1,up2,up1*

■ Parameter

offset

Offset frequency

Value	Offset Frequency
LOW2	−10.00 MHz
LOW1	−5.00 MHz
UP1	5.00 MHz
UP2	10.00 MHz

unit

Output unit

Value	Output unit
None	Depends on current set value (cf. UNIT_ADJ)
DB	dB
DBM	dBm
MW	mW
UW	μW
NW	nW

filtered power

Filtered Power

Resolution	Unit
0.01	dBm

offsetpower

Power at the frequency specified by *Offset*.

Resolution	Unit
0.01	Set value for unit

low2

Power at −10.00 MHz

Resolution	Unit
0.01	Set value for unit

low1

Power at −5.00 MHz

Resolution	Unit
0.01	Set value for unit

up1

Power at 5.00 MHz

Resolution	Unit
0.01	Set value for unit

up2

Power at 10.00 MHz

Resolution	Unit
0.01	Set value for unit

■ Use example

Reads out the power at 10.00MHz in dB unit.

<Program>

DSPL ADJ,SPECT1

SWP

ADJCH? UP2,DB

<Response>

−1.63

ADJRNG

■ Function

Adjust Range

Executes Adjust Range.

■ Syntax

Program Message	Query Message	Response Message
ADJRNG	---	---

■ Restrictions

- This function cannot be executed when the measurement screen is Setup Common Parameter or IQ Level screen.

■ Example of Use

Executes Adjust Range.

<Program>

ADJRNG

ADJRNGGOFS

■ Function

Adjust Range Offset
Sets the offset value for Adjust the Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
ADJRNGGOFS *offset*	ADJRNGOFS?	*offset*

■ Parameter

offset
Offset value of Adjust Range

Value	Adjust Range Offset	Initial value
0	0 dB	*
10	10 dB	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set the offset value of Adjust Range to 10dB
<Program>
DSPL RFPWR.FILTER
ADJRNGOFS 10
ADJRNGOFS?

<Response>
10

ALALLTPC

■ Function

Sets the Absolute Limit for TPC Slot Nos..1 thru 15

■ Syntax

Program Message	Query Message	Response Message
ALALLTPC *absolute*	ALALLTPC?	*absolute*

■ Parameter

absolute

Absolute Limit

Range	Resolution	Initial Value	Unit
0.00 to 99.99	0.01	0.80	dB

□ Suffix code

None: dB

DB: dB

■ Restrictions

- The “Terminal” must be set to “RF” beforehand. (*cf.* TERM)

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets the Absolute Limit for TPC to 40.00dB.

<Program>

DSPL SETTPC

ALALLTPC 40.00DB

ALALLTPC?

<Response>

40.00

ALLTPC

■ Function

Sets TPC Slot Nos.. 2 thru Analysis Slot in a batch.

■ Syntax

Program Message	Query Message	Response Message
ALLTPC *up_down, step*	---	---

■ Parameter

up_down

Specifies Up/Down for TPC

Value	Specifies Up/Dowm for TPC	Initial Value
UP	Specifies Up for all the slots.	*
DN	Specifies Down for all the slots.	
NO	Specifies 0 for all the slots.	

step

Specifies Up/Down level for TPC

Value	Specifies Up/Dowm level for TPC	Unit	Initial Value
None	Specifies 1 dB		*
1,2,3	Specifies set value.	dB	

■ Restrictions

- The value No (up-down) can be chosen only when the using measurement system is MX860x01B/ MX268x01B.
- The parameter step is can be set only when the using measurement system is MX860x01B/ MX268x01B

■ Initialization command

PRE, INI, IP, *RST

■ Use Example

Specifies Down for all the TPC slots.

<Program>

DSPL SETTPC

ALLTPC ON

■ Remarks

- Use the TPC command to check the set value for each slot.

ANLYLEN

■ Function

Analysis Length
Sets the analysis length of the modulated signal.

■ Syntax

Program Message	Query Message	Response Message
ANLYLEN *chip*	ANLYLEN?	*chip*

■ Parameter

chip
Number of analyzed chip

Range	Measuring Object (*cf.* MEASOBJ)	Resolution	Initial Value	Unit
256 to 2560	Up Link	256	2360	chip
Max SF to 2560	Down Link	Max SF	2048	chip
4 to 2560	QPSK	1	2560	chip

Max SF: Maximum value for the dispersion rate set by using the MAXSF command (*cf.* MAXSF)

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets the analysis length to 256 chips when performing a modulation analysis of the Up Link signal.
<Program>
MEASOBJ UPLNK
DSPL MODANAL
ANLYLEN 256
ANLYLEN?

<Response>
256

ANLYLEN_CCDF

■ Function

Analysis Length for CCDF

Sets the analysis length during CCDF measurement.

Refer to the following table for a relation between filter and analysis data at the minimum analysis time.

Filter (Hz)	Analysis data
20 MHz	64
10 MHz	32
5 MHz	32
3 MHz	32
3.84 MHz (RC)	32
3.84 MHz (RRC)	32

■ Syntax

Program Message	Query Message	Response Message
ANLYLEN_CCDF *a*	ANLYLEN_CCDF?	*a*

■ Parameter

a

Analysis length

Range	Resolution	Initial value
1 to 100000	1 μs	500 (500 μs)

□ Suffix code

None: μs

S: s

MS: ms

US: μs

■ Initialization command

PRE,INI,IP,∗RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the analysis length to 1 msec.

<Program>
DSPL CCDF,CCDF
ANLYLEN_CCDF 1MS
ANLYLEN_CCDF?

<Response>
1000

ANLYLEN_RFPWR

■ Function

Analysis Length for Transmitter Power
Sets analysis length for average power measurement during Transmitter Power measurement.
An analysis start position is set to (center position − (analysis length/ 2)).

■ Syntax

Program Message	Query Message	Response Message
ANLYLEN_RFPWR *a*	ANLYLEN_RFPWR?	*a*

■ Parameter

a
Analysis Length

Range	Resolution	Initial Value	Unit	Measure Method (*cf.* DSPL)
400.0 to 666.5	0.5	616.5	μs	TPC
400.0 to 1066.5	0.5	1016.5	μs	RACH

■ Initialization command

PRE,INI,IP,*RST

■ Restrictions

- This setting is possible only when Measure Method is set to TPC or RACH.
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets analysis length in 600.0 μs during TPC measurement.
<Program>
DSPL RFPWR,TPC
ANLYLEN_RFPWR 600.0
ANLYLEN_RFPWR?

<Response>
600.0

ANLYSTA

■ Function

Analysis Start

Sets a chip from which to start modulation analysis.

■ Syntax

Program Message	Query Message	Response Message
ANLYSTA *chip*	ANLYSTA	*chip*

■ Parameter

chip

Analysis-starting chip

Range	Measuring Object (*cf.* MEASOBJ)	Resolution	Initial value	Unit
0 to 38400	Up Link	256	0	chip
	Down Link	Max SF	512	chip
	QPSK	1	0	chip

Max SF: Maximum value for the dispersion rate set by using the MAXSF command (*cf.* MAXSF)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set the analysis-starting symbol to 512.

<Program>

MEASOBJ UPLNK

DSPL MODANAL

ANLYSTA 512

ANLISTA?

<Response>

512

ATT_ADJ

■ Function

Attenuator for Adjacent Channel Power
Sets the Attenuator at Adjacent Channel Power measurement

■ Syntax

Program Message	Query Message	Response Message
ATT_ADJ *a*	ATT_ADJ?	*a*

■ Value a

Attenuator

Range	RF Input	Resolution	Initial value	Unit
20 to 80	High Power	2	50	dB
0 to 62	Low Power	2	50	dB

□ Suffix code
None: dB
DB: dB

■ Initialization command

PRE, INI, IP, ∗RST

■ Restrictions

- Attenuator range depends on RF Input or Ref Level (*cf.* RFINPUT, RL_ADJ).

■ Use example

Sets Attenuator to 20 dB.
<Program>
ATTMD_ADJ AUTO
RL_ADJ −30DBM
ATT_ADJ 20 DB
ATT_ADJ?

<Response>
20

ATT_OBW

■ Function

Attenuator for Occupied Bandwidth
Sets the Attenuator for Occupied Bandwidth measurement with spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
ATT_OBW *a*	ATT_OBW?	*a*

■ Value of a

Range	RF Input	Resolution	Initial value	Unit
20 to 80	High Power	2	50	dB
0 to 62	Low Power	2	50	dB

□ Suffix code
None: dB
DB: dB

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- Attenuator setting range depends on RF Input or Ref Level (*cf.* RFINPUT RL_OBW).

■ Use example

Sets Attenuator to 20 dB.
<Program>
ATTMD_OBW AUTO
RL_OBW −30DBM
ATT_OBW 20DB
ATT_OBW?

<Response>
20

ATT_SMASK

■ Function

Attenuator for Spectrum Emission Mask

Sets the Attenuator for Spectrum Emission Mask measurement with spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
ATT_SMASK *a*	ATT_SMASK?	*a*

■ Value of a

Range	RF Input	Resolution	Initial value	Unit
20 to 80	High Power	2	50	dB
0 to 62	Low Power	2	50	dB

□ Suffix code

None: dB

DB: dB

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- Attenuator setting range depends on RF Input or Ref Level (*cf.* RFINPUT, RL_SMASK)

■ Use example

Setting Attenuator to 20 dB.

<Program>

ATTMD_SMASK AUTO

RL_SMASK −30DBM

ATT_SMASK 20DB

ATT_SMASK?

<Response>

20

ATTMD_ADJ

■ Function

Attenuator Mode: Manual/Auto for Adjacent Channel Power

Selects manual or automatic Attenuator setting of spectrum analyzer for Adjacent Channel Power screen.

■ Syntax

Program Message	Query Message	Response Message
ATTMD_ADJ *a*	ATTMD_ADJ?	*a*

■ Value of a

Attenuator setting mode

Value	Mode	Initial value
MAN	Sets Attenuator setting mode to manual	
AUTO	Sets Attenuator setting mode to automatic	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Attenuator is changed in Auto, the mode becomes Manual, forcibly.
- When Auto, Attenuator is set automatically.

■ Use example

Setting Attenuator to Auto mode.

<Program>

ATTMD_ADJ AUTO

ATTMD_ADJ?

<Response>

AUTO

ATTMD_OBW

■ Function

Attenuator Mode: Manual/Auto for Occupied Bandwidth

Select manual or automatic Attenuator setting of spectrum analyzer for Occupied Bandwidth screen.

■ Syntax

Program Message	Query Message	Response Message
ATTMD_OBW *a*	ATTMD_OBW?	*a*

■ Value of a

Attenuator setting mode

Value	Mode	Initial value
MAN	Sets Attenuator setting mode to manual	
AUTO	Sets Attenuator setting mode to automatic	*

■ Initialization command

PR, INI, IP, *RST

■ Restrictions

- When Attenuator is changed in Auto, the mode is forcibly switched to Manual.
- When Auto, Attenuator is set automatically.

■ Use example

Sets the Attenuator to Auto Mode.

<Program>

ATTMD_OBW AUTO

ATTMD_OBW?

<Response>

AUTO

ATTMD_SMASK

■ Function

Attenuator Mode: Manual/Auto for Spectrum Emission Mask

Selects manual of automatic setting of spectrum analyzer for Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
ATTMD_SMASK *a*	ATTMD_SMASK?	*a*

■ Value a

Attenuator setting mode

Value	Mode	Initial value
MAN	Sets Attenuator setting mode to manual	
AUTO	Sets Attenuator setting mode to automatic	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Attenuator is changed in Auto, the mode becomes Manual, forcibly.
- When Auto, Attenuator is set automatically.

■ Use example

Sets the Attenuator to Auto mode.

<Program>

ATTMD_SMASK AUTO

ATTMD_SMASK?

<Response>

AUTO

ATTRLMD_ADJ

■ Function

Attenuator Ref Level Mode: Manual/Auto for Adjacent Channel Power

Selects manual or automatic Attenuator/Ref-Level setting spectrum analyzer for Adjacent Channel Power screen.

■ Syntax

Program Message	Query Message	Response Message
ATTRLMD_ADJ *a*	ATTRLMD_ADJ?	*a*

■ Parameter

Attenuator/Ref-level setting mode

Value	Mode	Initial value
MAN	Sets Attenuator/Ref-Level setting mode to manual	
AUTO	Sets Attenuator/Ref-Level setting mode to automatic	*

■ Initialization command

PRE, INI, IP,*RST

■ Restrictions

- When Attenuator or Ref Level is changed in Auto, the mode becomes Manual, forcibly.
- When Auto, Attenuator and Ref Level are set automatically.

■ Use example

Setting Attenuator/Ref-Level to Auto mode.

<Program>

ATTRLMD_ADJ AUTO

ATTRLMD_ADJ?

<Response>

AUTO

ATTRLMD_OBW

■ Function

Attenuator Ref Level Mode: Manual/Auto for Occupied Bandwidth

Selects manual or automatic Attenuator/Ref-Level setting spectrum analyzer for Occupied Bandwidth screen.

■ Syntax

Program Message	Query Message	Response Message
ATTRLMD_OBW *a*	ATTRLMD_OBW?	*a*

■ Parameter

Attenuator/Ref-level setting mode

Value	Mode	Initial value
MAN	Sets Attenuator/Ref-Level setting mode to manual	
AUTO	Sets Attenuator/Ref-Level setting mode to Auto	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Attenuator or Ref Level is changed in Auto, the mode becomes Manual, forcibly.
- When Auto, Attenuator and Ref Level to Auto mode.

■ Use example

Setting Attenuator and Ref Level to Auto.

<Program>

ATTRLMD_OBW AUTO

ATTRLMD_OBW?

<Response>

AUTO

ATTRLMD_SMASK

■ Function

Attenuator Ref Level Mode: Manual/Auto for Spectrum Emission Mask

Selects manual or automatic Attenuator/Ref-Level setting of spectrum analyzer for Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
ATTRLMD_SMASK *a*	ATTRLMD_SMASK?	*a*

■ Parameter

Attenuator/Ref-level setting mode

Value	Mode	Initial value
MAN	Sets Attenuator/Ref Level setting mode to manual	
AUTO	Sets Attenuator/Ref Level setting mode to Auto	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Attenuator or Ref-Level is changed in Auto, the mode becomes Manual, forcibly.
- When Auto, Attenuator and Ref-level are set automatically.

■ Use example

Sets Attenuator and Ref Level to Auto mode.

<Program>

ATTRLMD_SMASK AUTO

ATTRLMD_SMASK?

<Response>

AUTO

AUTODET

■ Function

Auto Rate Detection
Sets the Auto Rate Detection function to On or Off at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
AUTODET *on_off*	AUTODET?	*on_off*

■ Parameter

on-off
Setting Auto Rate Detection to On/Off

Value	Setting Auto Rate Detection to On/Off	Initial value
ON	Sets Auto Rate Detection to On.	
OFF	Sets Auto Rate Detection to Off.	*

■ Restrictions

- Measuring Object needs to be set to Up Link or Down Link beforehand. (*cf.* MEASOBJ)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Auto Rate Detection to On.
<Program>
MEASOBJ UPLNK
DSPL MODANAL
AUTODET ON
AUTODET?

<Response>
ON

AVGMD_MOD

■ Function

Average Mode for Modulation Analysis

Selects average mode at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
AVGMD_MOD *mode*	AVGMD_MOD?	*mode*

■ Parameter

mode

Attenuator/Ref-level setting mode

Value	Average Mode	Initial value
NRM	Normal: Displays result of one slot.	*
CONTS	Continuous: Displays average of each slot.	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Used example

Sets the Average mode to Continuous.

<Program>

AVGMD_MOD CONTS

AVEMD_MOD?

<Response>

CONTS

AVR_ADJ

■ Function

Average Count for Adjacent Channel Power

Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to Average at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_ADJ *count*	AVR_ADJ?	*count*

■ Parameter

count

Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Average Count to 500.

<Program>

DSPL ADJ,MOD

STRG_ADJ AVG

AVR_ADJ 500

AVR_ADJ?

<Response>

500

AVR_IQL

■ Function

Average Count for IQ Level

Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to Average at IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_IQL *count*	AVR_IQL?	*count*

■ Parameter

count

Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP,∗RST

■ Use example

Sets Average Count to 500.

<Program>

DSPL IQLVL

STRG_IQL AVG

AVR_IQL 500

AVR_IQL?

<Response>

500

■ Restrictions according to model type and options

For MS268x, if Option-17 or -18 is not installed, this command is invalid.

AVR_MOD

■ Function

Average Count for Modulation Analysis
Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to Average at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_MOD *count*	AVR_MOD?	*count*

■ Parameter

count
Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Average Count to 500.
<Program>
DSPL MODANAL
STRG_MOD AVG
AVR_MOD 500
AVR_MOD?

<Response>
500

AVR_OBW

■ Function

Average Count for Occupied Bandwidth

Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to Average at Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_OBW *count*	AVR_OBW?	*count*

■ Parameter

count

Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Average Count to 500.

<Program>
DSPL OBW, SPECT
STRG_OBW AVG
AVR_OBW 500
AVR_OBW?

<Response>
500

AVR_RFPWR

■ Function

Average Count for Transmitter Power
Sets the average (measurement) count (number of averaging processes) when Storage Mode is Average at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_RFPWR *count*	AVR_RFPWR?	*count*

■ Parameter

count
Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Average Count to 500.
<Program>
DSPL RFPWR,FILTER
STRG_RFPWR AVG
AVR_RFPWR 500
AVR_RFPWR?

<Response>
500

AVR_SMASK

■ Function

Average Count for Spectrum Emission Mask

Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to Average at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_SMASK *a*	AVR_SMASK?	*a*

■ Value of a

Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Average Count to 500.

<Program>

DSPL SMASK

STRG_SMASK AVG

AVR_ SMASK 500

AVR_ SMASK?

<Response>

500

AVR_SPU

■ Function

Average Count for Spurious Emission

Sets the average (measurement) count (number of averaging processes) when Storage Mode is set to average at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
AVR_SPU *count*	AVR_SPU?	*count*

■ Parameter

count

Average (measurement) count

Range	Resolution	Initial Value
2 to 9999	1	10

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Average Count to 500.

<Program>

DSPL SPURIOUS, SWEEP

STRG_SPU AVG

AVR_SPU 500

AVR_SPU?

<Response>

500

BAND

■ Function

Preselector
Sets a measurement route prior to signal measurement.

■ Syntax

Program Message	Query Message	Response Message
BAND *pre*	BAND?	*pre*

■ Parameter

pre
Preselector setting

Value	Preselector Setting	Initial Value
0	Normal	*
1	Spurious	

■ Initialization command

*RST

■ Use example

Sets the preselector to Spurious.
<Program>
BAND 1
BAND?

<Response>
1

■ Restrictions according to model type and options

This function is valid when main unit is MS8608A/MS2683A.
If Option MS8608A-03/MS2683A-03 is not installed, this command is invalid.

BIN

■ Function

Sets ASCII or binary format to read the waveform data.

■ Syntax

Program Message	Query Message	Response Message
BIN *format*	BIN?	*format*

■ Parameter

format

Specification of ASCII or binary format

Value	ASCII/Binary	Initial value
ON	Binary format	*
1		
OFF	ASCII format	
0		

■ Initialization command

*RST

■ Use example

Reads the waveform data in binary format.

<Program>

BIN ON

BIN?

<Response>

ON

BS

■ Function

Back Screen

Switches the screen from the current screen to the upper-layer screen by one rank.

■ Syntax

Program Message	Query Message	Response Message
BS	---	---

■ Use example

Moves to the upper screen.

<Program>

BS

■ Remarks

- The Setup Common Parameter is the uppermost screen.

CALCANCEL

■ Function

Power Calibration Cancel
Cancels the power calibration and resets the calibration value to 0.00.

■ Syntax

Program Message	Query Message	Response Message
CALCANCEL	---	---

■ Restrictions

- This function cannot be executed when the displayed measurement screen is Setup Common Parameter, Power Meter or IQ Level (*cf.* DSPL)

■ Use example

Cancels power calibration.
<Program>
CALVAL 10.00DB
CALVAL?
CALCANCEL
CALVAL?

<Response>
2,10.00
0,0.00

CALVAL

■ Function

Power Calibration Value
Sets the calibration value for Power Calibration.

■ Syntax

Program Message	Query Message	Response Message
CALVAL *callevel*	CALVAL?	*calmode, callevel*

■ Parameter

callevel
Calibration value

Range	Resolution	Initial value	Unit
−10.00 to 10.00	0.01	0.00	dB

□ Suffix code

None: dB
DB: dB

calmode
Calibration type

Value	Calibration Type	Initial Value
0	Uncalibrated	*
1	Internal calibrated (Power Cal.)	
2	External calibrated	
3	Internal calibrated (Multi Carr. Cal)	

■ Restrictions

- This function cannot be set when the measurement screen is IQ Level. (*cf.* DSPL).

■ Use example

Sets the calibration value to 5 dB.
<Program>
CALVAL 5.00
CALVAL ?

<Response>
2,5.00

CAPTIME_RFPWR

■ Function

Capture Time for Transmitter Power (RACH)

Sets the time for acquiring waveform when Measure Method is set to RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
CAPTIME_RFPWR? *a*	CAPTIME_RFPWR?	*a*

■ Parameter

Range	Resolution	Unit	Initial Value
10.0 to 100.0	0.1	ms	30.0

□ Suffix code

None: ms

MS: ms

■ Restrictions

- This setting is possible only when Measure Method is set to RACH. (*cf.* DSPL)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the time for acquiring waveform to 100ms.

<Program>

DSPL RFPWR, TPC

CAPTIME_RFPWR 100

CAPTIME_RFPWR?

<Response>

100

CARRF

■ Function

Carrier Frequency

Outputs the carrier frequency at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	CARRF?	*freq*

■ Parameter

freq

Carrier frequency

Resolution	Unit
0.1	Hz

■ Use example

Reads out the carrier frequency.

<Program>

MEAS MODANAL

CARRF?

<Response>

1922499857.2

CARRFERR

■ Function

Carrier Frequency Error
Outputs the carrier frequency error at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	CARRFERR? *unit*	*freq*

■ Parameter

unit
Output unit

Value	Output Unit
None	Hz
HZ	Hz
PPM	ppm

freq
Frequency error

Resolution	Unit
0.1	Hz
0.01	ppm

■ Use example

Reads out the carrier frequency error.
<Program>
MEAS MODANAL
CARRFERR? HZ

<Response>
−14.5

CCDFDSTRBT

■ Function

Distribution for CCDF

Outputs distribution waveform at CCDF measurement.

■ Syntax

Program Message	Query Message	Response Message
---	CCDFDSTRBT? *a,b,c*	*d(1),b(2),...,d(b)*

■ Value of a

Start position of read-out data

Range	Resolution	Unit	Measure Method
−50.0 to 50.0	0.1	dB	APD
0.0 to 50.0	0.1	dB	CCDF

■ Value of b

Number of read-out data

Range	Resolution	Measure Method
1 to 1001	1	APD
1 to 501	1	CCDF

■ Value of c

Output waveform data

Value	Output waveform data
None	Outputs the measured waveform data
0	
1	Outputs the waveform data set up by Save Reference Trace (*cf.* SAVETR_CCDF).
2	Outputs the waveform data of Gaussian Trace.

■ Value of d(n)

Read-out data

Range	Resolution
0.0001 to 1.0000	0.0001

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out five distribution waveforms from address 0.

<Program>

DSPL CCDF,CCDF

SWP

CCDFDSTRBT? 0,5

<Response>

0.5123, 0.2432, 0.1234, 0.1123, 0.00123

CDANAL

■ Function

Outputs the measured results of Code Domain Power, Code Domain Error and Waveform Quality for the specified Spreading Factor and Channelization Code at Modulation Analysis measurement.
Unless the Spreading Factor or Channelization Code is specified, the measured result is output for that in the signal component

■ Syntax

Program Message	Query Message	Response Message
---	CDANAL? *sf,code,phase*	*Pwr_rel,err,qual,pwr_abs*
---	CDANAL? PWR,*phase*	sf1,code1,pwr_rel1,sf2,code2,pwr_rel2,…
---	CDANAL? ERR,*phase*	*sf1,code1,err1,sf2,code2,err2,…*
---	CDANAL? WAVE,*phase*	*sf1,code1,qual1,sf2,code2,qual2,…*
---	CDANAL? PWRABS,*phase*	*sf1,code1,pwr_abs1,sf2,code2,pwr_abs2,…*
---	CDANAL? ALL*phase*	*Sf1,code1,pwr_rel1,err1,qual1,pwr_abs1,* *Sf2,code2,pwr_rel2,err2,qual2,pwr_abs2,…*

■ Parameter

sf

Spreading Factor

Range	Measuring Object (cf. MEASOBJ)
4, 8, 16, 32, 64, 128, 256	Up Link
4, 8, 16, 32, 64, 128, 256, 512	Down Link

code

Channelization Code Number

Range	Resolution
0 to (*sf* −1)	1

pwr_rel

Code Domain Power (Relative)

Resolution	Unit
0.01	dB

err

Code Domain Error

Resolution	Unit
0.01	dB

pwr_abs

Code Domain Power (absolute)

Resolution	Unit
0.01	dB

qual

Waveform Quality

Resolution	Unit
0.00001	None

phase

Signal specification

Value	Signal	Measuring Object (*cf.* MEASOBJ)
None	Currently set signal	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

■ Restrictions

- Setting of *sf* and *code* is not enable when Auto Rate Detection is set to ON. (*cf.* AUTODET).
- Setting of *PWR*, *ERR*, *WAVE*, *PWRABS*, *ALL* is not enable when Auto Rate Detection is set to OFF.
- *phase* specification is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ).

■ Use example

[1] Reads out the measured results of Code Domain Power (relative), Code Domain Error and Waveform Quality, Code Domain Power (absolute) when the Spreading Factor and Channelization Code are set to 64 and 3, respectively.

<Program>

DSPL MODANAL
TRFORM CODE
AUTODET OFF
SWP
CDANAL? 64,3

<Response>

−1.25, −10.44, 0.00152, −0.44

[2] Reads out the measured results of Code Domain Error at each Spreading Factor and Channelization Code.

<Program>

```
DSPL MODANAL
SWP
AUTODET ON
CDANAL? ERR,I
```

<Response>

4, 0,－12.4, 8.0, －8.55,…..

CDDSPL

■ Function

Code Domain Display

Specifies Code Domain Power or Code Domain Error as the Trace display when the selected Trace Format is Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
CDDSPL *trace*	CDDSPL?	*trace*

■ Parameter

trace

Trace display

Value	Trace Display	Initial Value
PWR	Displays Code Domain Power.	*
ERR	Displays Code Domain Error.	

■ Restrictions

- Measuring Object must be set to Up Link or Down Link beforehand. (*cf.* MEASOBJ)
- Trace Format must be set to Code Domain beforehand. (*cf.* TRFORM)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the code domain display to Code Domain Error

<Program>

DSPL SETCOM

MEASOBJ UPLNK

DSPL MODANAL

TRFORM CODE

CDDSPL ERR

CDDSPL?

<Response>

ERR

CFMKR_DEMOD

■ Function

Select Compressed Frame Marker Mode for Demodulation

Set whether to perform marker setup of Compressed Frame by on marker setup of Normal Frame at Demodulation measurement.

Refer to the following table for the parameter of Normal Frame and Compressed Frame each marker in Auto/Manual.

<table>
<tr><th colspan="2">Marker</th><th>Scrambling Code</th><th>Spreading Factor</th><th>Channelization Code</th></tr>
<tr><td rowspan="2">Auto</td><td>Normal Frame Marker</td><td>Ordinary Scrambling Code</td><td>Set-up Spreading Factor</td><td>Set-up Channelization Code</td></tr>
<tr><td>Compressed Frame Marker</td><td>Set-up Scrambling Code</td><td>Automatic setting</td><td>Automatic setting</td></tr>
<tr><td rowspan="2">Manual</td><td>Normal Frame Marker</td><td>Ordinary Scrambling Code</td><td>Set-up Spreasing Factor</td><td>Set-up Channelization Code</td></tr>
<tr><td>Compressed Frame Marker</td><td>Set-up Scrambling Code</td><td>Set-up Spreading Factor</td><td>Set-up Channelization Code</td></tr>
</table>

Refer to SETCH_DEMOD for Set-up Scrambling Code, Set-up Spreading Factor, Set-up Channelization Code.

■ Syntax

Program Message	Query Message	Response Message
CFMKR_DEMOD *a*	CFMKR_DEMOD?	*a*

■ Parameter

Value of a

CF Marker Mode

Value	CF Merker Mode	Initial valen
AUTO	Sets marker point of Compressed Mode with reference to Normal Frame Marker automatically.	*
MAN	Sets marker point of Compressed Mode manually.	

■ Function

- Measuring Object must be set to Down Link (Compress) beforehand (cf. MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Using example

Set CF Marker Mode to Auto when Normal Frame channel is SF=128 and CH=11.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL DEMOD
CFMKR_DEMOD AUTO
CFSC_DEMOD ALTN
SETCH_DEMOD 11,128,1
CFMKR_DEMOD?
```

<Response>

```
AUTO
```

CFMKR_MOD

■ Function

Select Compressed Frame Marker Mode for Code vs. Time
Sets whether to perform marker setup of Compressed Frame by marker setup of Normal Frame at Modulation Analysis measurement when Trace Format is Code vs. Time.
Refer to the following table for the parameter of Normal Frame and Compressed Frame each marker in Auto/Manual.

Marker		Scrambling Code	Spreading Factor	Channelization Code
Auto	Normal Frame Marker	Ordinary Scrambling Code	Set-up Spreading Factor	Set-up Channelization Code
	Compressed Frame Marker	Set-up Scrambling Code	Automatic setting	Automatic setting
Manual	Normal Frame Marker	Ordinary Scrambling Code	Set-up Spreasing Factor	Set-up Channelization Code
	Compressed Frame Marker	Set-up Scrambling Code	Set-up Spreading Factor	Set-up Channelization Code

Refer to SETCH_DEMOD for Set-up Scrambling Code, Set-up Spreading Factor, Set-up Channelization Code.

■ Syntax

Program Message	Query Message	Response Message
CFMKR_MOD *a*	CFMKR_MOD?	*a*

■ Parameter

Value of a
CF Marker Mode

Value	CF Merker Mode	Initial valen
AUTO	Sets marker point of Compressed Mode with reference to Normal Frame Marker automatically.	*
MAN	Sets marker point of Compressed Mode manually.	

■ Restrictions

- Measuring Object must be set to Down Link (Compress) beforehand (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets CF Marker Mode to Auto when Normal Frame channel is SF=128 and CH=11

<Program>

```
DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL MODANAL
TRFORM CDVSTM
CFMKR_MOD AUTO
CFSC_CDVSTM ALTN
SETCH_CDVSTM 11,128,1
CFMKR_MOD?
```

<Response>

```
AUTO
```

CFSC_CDVSTM

■ Function

Select Scramble Code for Compressed Mode

Sets Scramble Code used in analysis of Compressed Mode channel at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
CFSC_CDVSTM *a*	CFSC_CDVSTM?	*a*

■ Parameter

Value of a

Value	CF Marker Mode	CF Marker Mode	Initial value
ORD	Auto	Analyzes by Normal Scramble Code.	*
ALTN	Auto	Analyzes by Alternative Scramble Code.	
ORD	Manual	Analyzes by Normal Scramble Code.	
LALTN	Manual	Analyzes by Left Alternative Scramble Code.	
RALTN	Manual	Analyzes by Right Alternative Scramble Code.	

Setup of CF Marker Mode is performed CFMKR_MOD.

■ Restrictions

- Measuring Object must be set to Down Link (Compress) beforehand (cf. MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Scramble Code of Compress Mode to Alternative when Normal Frame channel is SF=128 and CH=11.

<Program>

DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL MODANAL
TRFORM CDVSTM
CFMKR_MOD AUTO
CFSC_CDVSTM ALTN
SETCH_CDVSTM 11, 128, 1
CFSC_CDVSTM?

<Response>

ALTN

CFSC_DEMOD

■ Function

Select Scramble Code for Compressed Mode
Sets Scramble Code used in analysis of Compressed Mode channel at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
CFSC_DEMOD *a*	CFSC_DEMOD?	*a*

■ Parameter

Value of a

Value	CF Marker Mode	CF Marker Mode	Initial value
ORD	Auto	Analyzes by Normal Scramble Code.	*
ALTN	Auto	Analyzes by Alternative Scramble Code.	
ORD	Manual	Analyzes by Normal Scramble Code.	
LALTN	Manual	Analyzes by Left Alternative Scramble Code.	
RALTN	Manual	Analyzes by Right Alternative Scramble Code.	

Setup of CF Marker Mode is performed CFMKR_DEMOD.

■ Restrictions

- Measuring Object must be set to Down Link (Compress) beforehand (cf. MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Scramble Code of Compressed Mode to Alternative when Normal Frame channel is SF=128 and CH=11.

<Program>
DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL DEMOD
CFMKR_DEMOD AUTO
CFSC_DEMOD ALTN
SETCH_DEMOD 11, 128, 1
CFSC_DEMOD?

<Response>
ALTN

CFSLTFORM_DEMOD

■Function

At Demodulation Data measurement, if performing phase correction corresponding to phase control for Antenna 2 in Closed Loop Mode, then the Slot Format of demodulation target DPCH in the compressed frame is specified.

■Syntax

Program Message	Query Message	Response Message
CFSLTFORM_DEMOD *format*	CFSLTFORM _DEMOD?	*format*

■Parameter

format

Selecting Slot Format

Value	Slot Format
0A	Demodulates the Code Channel of Slot Format 0A.
2A	Demodulates the Code Channel of Slot Format 2A.
3A	Demodulates the Code Channel of Slot Format 3A.
4A	Demodulates the Code Channel of Slot Format 4A.
5A	Demodulates the Code Channel of Slot Format 5A.
6A	Demodulates the Code Channel of Slot Format 6A.
7A	Demodulates the Code Channel of Slot Format 7A.
8A	Demodulates the Code Channel of Slot Format 8A.
9A	Demodulates the Code Channel of Slot Format 9A.
10A	Demodulates the Code Channel of Slot Format 10A.
11A	Demodulates the Code Channel of Slot Format 11A.
12A	Demodulates the Code Channel of Slot Format 12A.
13A	Demodulates the Code Channel of Slot Format 13A.
14A	Demodulates the Code Channel of Slot Format 14A.
15A	Demodulates the Code Channel of Slot Format 15A.
16A	Demodulates the Code Channel of Slot Format 16A.
0B	Demodulates the Code Channel of Slot Format 0B.
1B	Demodulates the Code Channel of Slot Format 1B.
2B	Demodulates the Code Channel of Slot Format 2B.
3B	Demodulates the Code Channel of Slot Format 3B.
4B	Demodulates the Code Channel of Slot Format 4B.
5B	Demodulates the Code Channel of Slot Format 5B.
6B	Demodulates the Code Channel of Slot Format 6B.
7B	Demodulates the Code Channel of Slot Format 7B.
8B	Demodulates the Code Channel of Slot Format 8B.
9B	Demodulates the Code Channel of Slot Format 9B.
10B	Demodulates the Code Channel of Slot Format 10B.
11B	Demodulates the Code Channel of Slot Format 11B.
12B	Demodulates the Code Channel of Slot Format 12B.

13B	Demodulates the Code Channel of Slot Format 13B.
14B	Demodulates the Code Channel of Slot Format 14B.
15B	Demodulates the Code Channel of Slot Format 15B.

■Initialization command

PRE, INI, IP, ＊RST

■Restrictions

・ Measuring Object must be set to Down Link or Down Link (Compress) beforehand (*cf.* MEASOBJ).
・ Available only for MX860x01B/MX268x01B.
・ Valid conditions of Parameter are shown in the table below.

		Closed Loop Mode	
		Mode 1	Mode 2
Spreading Factor	512	0A*	0A*
	256	0B*,1B,4A,5A,6A,7A	0B*,1B,2A,3A,4A,5A,6A,7A,
	128	4B*,5B,6B,7B,8A,9A,10A,11A	2B*,3B,4B,5B,6B,7B,8A,9A,10A,11A
	64	8B*,9B,10B,11B,12A	8B*,9B,10B,11B,12A
	32	12B*,13A	12B*,13A
	16	13B*,14A	13B*,14A
	8	14B*,15A	14B*,15A
	4	15B*,16A	15B*,16A

“ * ” indicates the Initial value in each condition.

■Use example

Sets the Slot Format of demodulation target DPCH in a compressed frame to 4A.

<Program>

```
MEASOBJ DNLNKCOMP
DSPL DEMOD
CFMKR_DEMOD MAN
DEMODCHAN_DEMOD CF
SETCH_DEMOD 11,256,2
CFSLTFORM_DEMOD 4A
CFSLTFORM_DEMOD?
```

<Response>

```
4A
```

CHAN

■ Function

Channel

Sets the channel

■ Function

Program Message	Query Message	Response Message
CHAN *ch*	CHAN	*ch*

■ Parameter

ch

Channel

Range	Resolution	Initial Value
1 to 20000	1	9600

■ Restrictions

- Terminal must be set to RF beforehand (*cf.* TERM)
- When the Frequency falls outside the specified setting range due to the Channel Spacing value, the Channel cannot be change even within the specified Channel setting range. (*cf.* CHSPC)

■ Initialization command

*RST

■ Used example

Sets the channel to 5

<Program>

TERM RF

CHAN 5

CHAN?

<Response>

5

CHFREQ

■ Function

Channel and Frequency

Sets the channel number and the frequency at the same time

■ Syntax

Program Message	Query Message	Response Message
CHFREQ *ch,freq*	---	---
---	CHAN?	*ch*
---	FREQ?	*freq*

■ Parameter

ch

Channel

Range	Resolution	Initial Value
1 to 20000	1	9600

freq

Range	Model	Resolution	Initial Value	Unit
100 to 7900000000	MS8608A	1	1920000000	Hz
100 to 13200000000	MS8609A	1	1920000000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GH: GHz

■ Restrictions

- Terminal must be set to RF beforehand. (*cf.* TERM)

■ Initialization command

*RST

■ Use example

Sets the carrier frequency of Channel 2 to 1 GHz

<Program>

```
TERM RF
CHFREQ 2,1GHZ
CHAN?
FREQ?
```

<Response>

```
2
1000000000
```

CHPWR

■ Function

At Adjacent Channel Power measurement, outputs the measured results of Adjacent Channel Power at Offset or Leakage Power due to Modulation when the measurement method is selected to Spectrum or Modulation, respectively.
This command has the same functions as the ADJCH command.

■ Syntax

Program Message	Query Message	Response Message
---	CHPWR?	*filteredpower*
---	CHPWR? *offset*	*offsetpower*
---	CHPWR? *offset, unit*	*offsetpower*
---	CHPWR? ALL	*low2, low1, up2, up1*
---	CHPWR? ALL, *unit*	*low2, low1, up2, up1*

■ Parameter

offset

Offset frequency

Value	Offset Frequency
LOW2	−10.00 MHz
LOW1	−5.00 MHz
UP1	5.00 MHz
UP2	10.00 MHz

unit

Output unit

Value	Offset Frequency
None	Depends on the currently set value. (*cf.* UNIT_ADJ.)
DB	dB
DBM	dBm
MW	mW
UW	μW
NW	nW

filtered power

FilteredPower

Resolution	Unit
0.01	dBm

offsetpower

Power at frequency specified by *offset*

Resolution	Unit
0.01	Set value for *unit*

low2

Power at −10.00 MHz

Resolution	Unit
0.01	Set value for *unit*

low1

Power at −5.00 MHz

Resolution	Unit
0.01	Set value for *unit*

up1

Power at 5.00 MHz

Resolution	Unit
0.01	Set value for *unit*

up2Power

Power at 10.00 MHz

Resolution	Unit
0.01	Set value for *unit*

■ Use example

Reads out the power at 10.00 MHz in dB unit.

<Program>

```
DSPL ADJ,SPECT1
SWP
CHPWR? UP2,DB
```

<Response>

−1.63

CHSPC

■ Function

Channel Spacing

Sets frequency spacing between channels.

■ Syntax

Program Message	Query Message	Response Message
CHSPC *freq*	CHSPC?	*freq*

■ Parameter

freq

Range	Resolution	Initial Value	Unit
−10000000000 to 10000000000	1	200000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GH: GHz

■ Restrictions

- Terminal must be set to RF beforehand (*cf.* TERM)

■ Initialization command

*RST

■ Use example

Sets the frequency spacing between channels to 300 kHz.

<Program>

TERM RF

CHAN 1

FREQ 400MHZ

CHSPC 300KHZ

CHSPC?

CHAN 2

FREQ?

<Response>

300000

400300000

CLOOP_DEMOD

■Function

At Demodulation Data measurement, this command sets whether to perform phase correction corresponding to phase control of Antenna 2 in Closed Loop Mode. If the phase correction is set to be perfomed, this command shall consequently select Mode.

■Syntax

Program Message	Query Message	Response Message
CLOOP_DEMOD *mode*	CLOOP_DEMOD?	*mode*

■Parameter

mode

Selecting Mode

Value	Selecting Mode	Initial value
OFF	Does not perform phase correction corresponding to Closed Loop Mode.	*
MODE1	Perform phase correction corresponding to phase control for Antenna 2 in Closed Loop Mode 1.	
MODE2	Perform phase correction corresponding to phase control for Antenna 2 in Closed Loop Mode 2.	

■Initialization command

PRE, INI, IP, *RST

■Restrictions

- Measuring Object must be set to Down Link or Down Link (Compress) beforehand（*cf.* MEASOBJ）.
- Available only for MX860x01B/MX268x01B.

■Use example

Demodulates Antenna 2 signals for Closed Loop Mode 2.

<Program>

MEASOBJ DNLNK

DSPL DEMOD

CLOOP_DEMOD MODE2

CLOOP_DEMOD?

<Response>

MODE2

CODECDANAL

■ Function

Scramble Code for Code Domain Power

Sets Scramble Code analyze Code Domain Power when Trace Format is Code vs Time on the Setup Parameter Screen.

■ Syntax

Program Message	Query Message	Response Message
CODECDANAL *a*	CODECDANAL?	*a*

■ Parameter

Value of a

Scramble Code setting

Value	Scramble Code setting	Initial value
ORD	Performs Code Domain analysis by Ordinary Scramble Code.	*
LALTN	Performs Code Domain analysis by Left Alternative Scramble Code.	
RALTN	Performs Code Domain analysis by Right Alternative Scramble Code.	

■ Restrictions

- Measuring Object must be set to Down Link (Compress) beforehand (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Performs Code Domain analysis by Right Alternative Scramble code.

<Program>

DSPL SETCOM

MEASOBJ DNLNKCOMP

DSPL MODANAL

TRFORM CDVSTM

CODECDANAL RALTN

CODECDANAL?

<Response>

RALTN

CODENO

■ Function

Scrambling Code Number

Sets the initial phase value for synchronization processing on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
CODENO *phase*	CODENO?	*phase*

■ Parameter

Range (Hexadecimal)	Measuring Object (*cf.* MEASOBJ)	Resolution	Initial Value
000000 to FFFFFF	Up Link	1	000000
00000 to 3FFFF	Down Link	1	00000

■ Restrictions

- The displayed measurement screen must be set to the Setup Common Parameter screen beforehand (*cf.* DSPL)
- Measuring Object must be set to Up Link or Down Link beforehand. (*cf.* MEASOBJ)
- Scrambling Code Sync must be set to Set beforehand when Measuring Object is set to Down Link (*cf.* CODESYNC).

■ Initialization command

*RST

■ Use example

Sets Scrambling Code Number to 12 when Measuring Object is set to Down Link.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

CODESYNC SET

CODENO 12

CODENO?

<Response>

12

CODENORACH

■ Function

Scrambling Code Number (RACH)
Sets the initial phase value for synchronization processing when Measuring Object is set to Up Link (RACH) on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
CODENORACH *phase*	CODENORACH?	*phase*

■ Parameter

phase
Initial phase value

Range (Hexadecimal)	Measuring Object (*cf.* MEASOBJ)	Resolution	Initial Value
0000 to 1FFF	Up Link (RACH)	1	0000

■ Restrictions

- The displayed measurement screen must be set to the Setup Common Parameter screen beforehand.(*cf.* DSPL)
- Measuring Object must be set to Up Link (RACH) beforehand. (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

*RST

■ Use example

Sets Scrambling Code Number to 12 when Measuring Object is set to Up Link (RACH).
<Program>
DSPL SETCOM
MEASOBJ UPLINKRACH
CODENORACH 12
CODENORACH?

<Response>
12

CODESYNC

■ Function

Scrambling Code Synchronization

For synchronization processing, specifies whether to use SCH or initial phase value specified by Scrambling Code Number, when Measuring Object is set to Down Link on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
CODESYNC *syncmode*	CODESYNC?	*syncmode*

■ Parameter

syncmode

Synchronization processing setting

Value	Synchronization Processing Setting	Initial value
AUTO	Uses SCH for synchronous processing.	*
SET	Uses the specified initial phase value for synchronous proseccing.	

■ Restrictions

- The displayed measurement screen must be set to the Setup Common Parameter screen beforehand. (*cf.* DSPL)
- Measuring Object must be set to Up Link or Down Link beforehand. (*cf.* MEASOBJ)

■ Initialization command

*RST

■ Use example

Uses SCH for synchronization processing.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

CODESYNC AUTO

CODESYNC?

<Response>

AUTO

CONTS

■ Function

Continuous Measure/Sweep

Executes continuous measurement and sweeping.

Accepts a command even during a measurement.

Suspends the current measurement and starts a new measurement when a measurement execution command, such as the CONTS command, is received during a measurement.

When an operation command not related to the current measurement (for example, the INTPOL command and query message) is received during a measurement, it continues carrying out the current measurement while responding to the command.

However, when a measurement related command is received during the current measurement, it suspends the measurement and executes the operation requested by the command.

■ Syntax

Program Message	Query Message	Response Message
CONTS	---	---

■ Use example

Continuously executes measurement and sweeping.

<Program>

CONTS

CORR

■ Function

Correction

Selects a correction data table for level correction.

■ Syntax

Program Message	Query Message	Response Message
CORR *table*	CORR?	*table*

■ Parameter

table

Correction data table

Value	Correction Data Table	Initial value
0	Does not perform data correction.	*
1	Table 1	
2	Table 2	
3	Table 3	
4	Table 4	
5	Table 5	

■ Initialization command

*RST

■ Use example

Selects Correction Data Table 3.

<Program>

CORR 3

CORR?

<Response>

3

DCOUNT_CCDF

■ Function

Measurement Data Count for CCDF

Sets the number of measurement data on the CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
DCOUNT_CCDF *a*	DCOUNT_CCDF?	*a*

■ Parameter

Value of a

Number of measured data

Value	Resolution	Initial Value
10000 to 2000,000,000	1	1000,000

□ Suffix code

None: 1 point

KP: K point

MP: M point

GP: G point

■ Initialization command

PRE, INI, IP, ∗RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the number of measured data to 10000.

<Program>

DSPL CCDF,CCDF

DCOUNT_CCDF 10KP

DCOUNT_CCDF?

<Response>

10000

DELTAMKR_CCDF

■ Function

Dalta marker Value for CCDF

Outputs power distribution, probability of Delta Marker on the CCDF screen.

Delta marker is set up by setting value of Reference Trace (*cf.* REFTR_CCDF), Outputs power distribution or probability by Display Data Type (*cf.* DISPTTYPE_CCDF).

Reference Trace	Delta Marker
Save Trace	Measure Trace − Save Trace
Gaussian Trace	Measure Trace − Gaussian Trace
Save 6 Gaussian	Measure Trace − Save Trace
Off	Not output

Display Data Type	Output format
Distribution	Power destribution
Probability	Probability

■ Syntax

Program Message	Query Message	Response Message
---	DELTAMKR_CCDF?	*a*

■ Parameter

Value of a

Output data

Resolution	Unit	Output format
0.0001	%	Probability
0.1	dB	Power distribution

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This setting is not enabled when Marker or Reference Trace is Off (*cf.* MKR_CCDF).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out difference of power deviation.

<Program>

```
DSPL CCDF,CCDF
MKR_CCDF VERT
REFTR_CCDF SAVE
SWP
DELTAMKR_CCDF?
```

<Response>

```
5.12
```

DEMODCHAN_DEMOD

■ Function

Demodulation Channel
Sets object Frame to demodulate for Demodulation Data screen.

■ Syntax

Program Message	Query Message	Response Message
DEMODCHAN_DEMOD*chan*	DEMODCHAN_DEMOD?	*chan*

■ Parameter

chan
Object Frame to demodulation late

Value	Object Frame to demodulation late	Initial Value
NF	Normal Frame	*
CF	Compressed Frame	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This setting is enable when Measuring Object is set to Down Link (Compress). (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets object Frame to CF
<Program>
MEASOBJ DNLNKCOMP
DSPL DEMOD
DEMODCHAN_DEMOD CF
DEMODCHAN_DEMOD?

<Response>
CF

DEMODPHASE

■ Function

Demodulation Phase

Sets the type of targeted signal to be demodulated on the Demodulation Data screen.

■ Syntax

Program Message	Query Message	Response Message
DEMODPHASE *phase*	DEMODPHASE?	*phase*

■ Parameter

phase

Type of targeted signal to be demodulated

Value	Type of Targeted Signal to be Demodulated	Initial Value
I	I signal	*
Q	Q signal	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the targeted signal to be demodulated to I.

<Program>

DSPL DEMOD

DEMODPHASE I

DEMODPHASE?

<Response>

I

DET_ADJ

■ Function

Detection Mode

Sets the wave-detection mode in Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
DET_ADJ *a,b*	DET_ADJ? *b*	*a*

■ Value of a

Wave-detection mode

Value	Wave-detection mode	Initial value
POS	Sets the wave-detection mode to Positive Peak. Makes the maximum value during one sampling period to the data of the thereof.	
NEG	Sets the wave-detection mode to Negative Peak. Makes the minimum value during one sampling period to the data of the thereof.	
SMP	Sets the wave-detection mode to Sample. Makes the instantaneous data at the point of when the hardware executes sampling operation to the data of that point.	*
AVG	Sets the wave-detection mode to Average. Makes the average value between sampling points to the data of the points.	
RMS	Sets the wave-detection mode to RMS. Makes the RMS value between sampling points to the data of the points.	

■ Value of b

Targeted Waveform Data

Value	Targeted Waveform Data
None	Sets Spectrum (All) waveform to object.
SPECT1	
SPECT2	Sets Spectrum (Separate) waveform to object.

■ Restrictions

- The RMS detection mode can be set only when Option 04 is installed and RBW Mode is set to Digital.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the wave-detection mode to Average.

<Program>

DET_ADJ AVG

DET_ADJ?

<Response>

AVG

■ Note

RMS is an option.

DET_OBW

■ Function

Detection Mode

Sets the wave-detection mode respective of Occupied Bandwidth measurement using a spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
DET_OBW *a*	DET_OBW?	*a*

■ Value of a

Wave-detection mode

Value	Wave-detection mode	Initial value
POS	Sets the wave-detection mode to Positive Peak. Makes the maximum value during one sampling period to the data of the thereof.	*
NEG	Sets the wave-detection mode to Negative Peak. Makes the minimum value during one sampling period to the data of the thereof.	
SMP	Sets the wave-detection mode to Sample. Makes the instantaneous data at the point of when the hardware executes sampling operation to the data of that point.	
AVG	Sets the wave-detection mode to Average. Makes the average value between sampling points to the data of the points.	
RMS	Sets the wave-detection mode to RMS Makes the RMS value between the sampling point to the data of the points.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the wave-detection mode to Average.

<Program>

DET_OBW AVG

DET_OBW?

<Response>

AVG

■ Note

RMS is an option.

DET_SMASK

■ Function

Detection Mode

Sets the wave-detection mode for Spectrum Analyzer at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
DET_SMASK *a*	DET_SMASK?	*a*

■ Value of a

mode

Wave-detection mode

Value	Wave-detection mode	Initial value
POS	Sets the wave-detection mode to Positive Peak. Makes the maximum value during one sampling period to the data of the thereof.	
NEG	Sets the wave-detection mode to Negative Peak. Makes the minimum value during one sampling period to the data of the thereof.	
SMP	Sets the wave-detection mode to Sample. Makes the instantaneous data at the point of when the hardware executes sampling operation to the data of that point.	
AVG	Sets the wave-detection mode to Average. Makes the average value between sampling points to the data of the points.	*
RMS	Sets the wave-detection mode to RMS. Makes the RMS value between the sampling point to the data of the points.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the wave-detection mode to Average.

<Program>

DET_SMASK AVG

DET_SMASK?

<Response>

AVG

■ Note

RMS is an option.

DET_SPU

■ Function

Detection Mode

Sets the wave-detection mode at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
DET_SPU *a, b*	DET_SPU? *a*	*b*

■ Value of a

Selection of a measuring method

Value	Measuring Method
SPOT	The wave-detection mode used in the spot measure method is the object hereof.
SEARCH	The wave-detection mode used in the search measure method is the object hereof.
SWEEP	The wave-detection mode used in the sweep measure method is the object hereof.

■ Value of b

Wave-detection mode

Value	Wave-detection mode	Initial Value
POS	Sets the wave-detection mode to Positive Peak. Makes the maximum value during one sampling period to the data of the thereof.	
NEG	Sets the wave-detection mode to Negative Peak. Makes the minimum value during one sampling period to the data of the thereof.	
SMP	Sets the wave-detection mode to Sample. Makes the instantaneous data at the point of when the hardware executes sampling operation to the data of that point.	
AVG	Sets the wave-detection mode to Average. Makes the average value between sampling points to the data of the points.	*
RMS	Sets the wave-detection mode to RMS. Makes the RMS value between the sampling point to the data of the points.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set the wave-detection mode of the Sweep method to Positive Peak.

<Program>

DET_SPU SWEEP,POS

DET_SPU? SWEEP

<Response>

POS

■ Note

RMS is an option.

DISPTYPE_CCDF

■ Function

Display Data Type for CCDF

Sets grid display form on CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
DISPTYPE_CCDF *a*	DISPTYPE_CCDF?	*a*

■ Value of a

Selection of a display form

Value	Display form	Initial value
PROB	Displays waveform distribution to the grid of vertical axis.	*
DSTRBT	Displays waveform distribution to the grid of horizontal axis.	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Distribution to PROB.

<Program>

DSPL CCDF,CCDF

DISPTYPE_CCDF PROB

DISPTYPE_CCDF?

<Response>

PROB

DISPTYPE_SMASK

■ Function

Display Data Type for Spectrum Emission Mask

Sets the display form of peak value at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
DISPTYPE_SMASK *a*	DISPTYPE_SMASK?	*a*

■ Value of a

Selection of a display form

Value	Display form	Initial value
LVL	Displays the level at measurement point of minimum margin for the template of each frequency band	*
MARGIN	Displays the margin at measurement point of minimum margin for the template of each frequency band. (It always displays by dB regardless of the setting value of Unit. (*cf.* UNIT_SMASK))	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the display type to MARGIN.

<Program>

DSPL SMASK

DISPTYPE_SMASK MARGIN

DISPTYPE_SMASK?

<Response>

MARGIN

DPTS_ADJ

■ Function

Data Points: 1001/501

Sets the number of data points received from Spectrum Analyzer sweeping on the Adjacent Channel Power screen.

■ Syntax

Program Message	Query Message	Response Message
DPTS_ADJ *a,mode*	DPTS _ADJ? *mode*	*a*

■ Value of a

Data number

Value	Data number	Initial value
1001	Set so that 1001 data points are received.	
501	Set so that 501 data points are received.	*

■ Value of mode

Targeted waveform data

Mode	Targeted Waveform data
None	Sets waveform of Spectrum (All).
SPECT1	
SPECT2	Sets waveform of Spectrum (Separate).

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- SPECT1 and SPECT 2 can be set up only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Set Spectrum Analyzer sweeping data to 1001 points.

<Program>

DPTS_ADJ 1001,SPECT1

DPTS_ADJ? SPECT1

<Response>

1001

DPTS_OBW

■ Function

Data Points: 1001/501

On the Occupied Bandwidth screen, set the number of data points receive from Spectrum Analyzer sweeping.

■ Syntax

Program Message	Query Message	Response Message
DPTS_OBW *a*	DPTS _OBW?	*a*

■ Value of a

Data number

Value	Data number	Initial value
1001	Set so that 1001 data points are received.	
501	Set so that 501 data points are received.	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set Spectrum Analyzer sweeping data to 1001 points.

<Program>

DPTS_OBW 1001

DPTS_OBW?

<Response>

1001

DSPL

■ Function

Sets the measurement screen and measurement method, but does not start a measurement.

■ Syntax

Program Message	Query Message	Response Message
DSPL *meas,mode*	DSPL?	*meas,mode*
DSPL *meas*	DSPL?	*meas*

■ Parameter

meas : Name of the measurement screen

mode : Measurement method / template type

<table>
<tr><th>meas Value</th><th>Name of the Measurement Screen</th><th>mode Value</th><th>Measurement Method/Template type</th><th>Initial value</th><th>Input Terminal (->TERM)</th></tr>
<tr><td>SETCOM</td><td>Setup Common Parameter</td><td>None</td><td>---</td><td>*</td><td rowspan="11">RF,
IQ-DC
IQ-AC
IQ-Balance</td></tr>
<tr><td>MODANAL</td><td>Modulation Analysis</td><td>None</td><td>---</td><td></td></tr>
<tr><td>DEMOD</td><td>Demodulation Data</td><td>None</td><td>---</td><td></td></tr>
<tr><td rowspan="5">RFPWR</td><td rowspan="5">Transmitter Power</td><td>FILTER</td><td>Filtered Power & Tx Power</td><td></td></tr>
<tr><td>RRCFILTER</td><td>Filtered Power</td><td></td></tr>
<tr><td>NONFILTER</td><td>Tx Power</td><td></td></tr>
<tr><td>TPC</td><td>TPC</td><td></td></tr>
<tr><td>RACH</td><td>RACH</td><td></td></tr>
<tr><td>SETTPC</td><td>Setup TPC</td><td>None</td><td>---</td><td></td></tr>
<tr><td>SETTPC2</td><td>Setup TPC2</td><td>None</td><td>---</td><td></td></tr>
<tr><td rowspan="2">CCDF</td><td rowspan="2">CCDF</td><td>CCDF</td><td>CCDF</td><td></td></tr>
<tr><td>APD</td><td>APD</td><td></td></tr>
<tr><td rowspan="3">OBW</td><td rowspan="3">Occupied Bandwidth</td><td>SPECT</td><td>Spectrum</td><td></td><td>RF</td></tr>
<tr><td>FFT</td><td>FFT</td><td></td><td rowspan="2">RF,
IQ-DC,
IQ-AC,
IQ-Balance</td></tr>
<tr><td>HIGH</td><td>FFT</td><td></td></tr>
</table>

<table>
<tr><th>meas Value</th><th>Name of the Measurement Screen</th><th>mode Value</th><th>Measurement Method/Template type</th><th>Initial value</th><th>Input Terminal (->TERM)</th></tr>
<tr><td rowspan="3">ADJ</td><td rowspan="3">Adjacent Channel Power</td><td>SPECT</td><td rowspan="2">Spectrum (All)</td><td rowspan="3"></td><td rowspan="10">RF</td></tr>
<tr><td>SPECT1</td></tr>
<tr><td>SPECT2</td><td>Spectrum (Separate)</td></tr>
<tr><td rowspan="3">SPURIOUS</td><td rowspan="3">Spurious Emission</td><td>SPOT</td><td>Spot</td><td></td></tr>
<tr><td>SEARCH</td><td>Search</td><td></td></tr>
<tr><td>SWEEP</td><td>Sweep</td><td></td></tr>
<tr><td rowspan="2">SETTBL_
SPU</td><td rowspan="2">Setup Frequency Table for Spurious Emission</td><td>SPOT</td><td>Spot</td><td></td></tr>
<tr><td>SWEEP</td><td>Search & Sweep</td><td></td></tr>
<tr><td>SMASK</td><td>Spectrum Mask</td><td>None</td><td>---</td><td></td></tr>
<tr><td>SETTEMP_
SMASK</td><td>Setup Spectrum Emission Mask Template</td><td>None</td><td>---</td><td></td></tr>
<tr><td>PWRMTR</td><td>Power Meter</td><td>None</td><td>---</td><td></td><td></td></tr>
<tr><td>IQLVL</td><td>IQ Level</td><td>None</td><td>---</td><td></td><td>IQ-DC
IQ-AC
IQ-Balance</td></tr>
</table>

■ Restrictions

- The setting SETTPC is possible only when Measure Method is set to TPC on Transmitter Power screen.
- RACH, SETTPC2, CCDF, APD can be used only when the using measurement system is MX860x01B /MX268x01B.
- For MS268x, Changing to IQ Level Screen is not allowed when Option-17 or -18 is not installed.
- For MS268x, Changing to Power Meter Screen is not allowed.

■ Initialization command

PRE, INI, IP,∗RST

■ Use example

[1] Moves to the screen to the Modulation Analysis screen.

<Program>

DSPL MODANAL

DSPL?

<Response>

MODANAL

[2] Moves to the Sweep measurement on the Spurious Emission screen.

<Program>

DSPL SPURIOUS,SWEEP

DSPL?

<Response>

SPURIOUS,SWEEP

DTXSETUP_MOD

■Function

DTX Setup

Sets PICH correction function to On/Off at Modulation Analysis measurement.

■Syntax

Program Message	Query Message	Response Message
DTXSETUP_MOD *on_off*	DTXSETUP_MOD?	*on_off*

■Parameter

on_off

PICH correction function

Value	DTX detection function On/Off setting	Initial value
OFF	Sets PICH correction function to Off.	＊
ON	Sets PICH correction function to On.	

■Restrictions

- This command is available when Measuring Object is set to Down Link or Down Link(Compressed) (*cf.*MEASOBJ).
- Available only for MX860x01B/MX268x01B.

■Initialization command

PRE, INI, IP, ＊RST

■Use example

Sets PICH correction function to On.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

DTXSETUP_MOD ON

DTXSETUP_MOD?

<Response>

ON

ERRSC

■ Function

Error Scale for Constellation

Sets a circle which shows the error range of each symbol in the Constellation display mode at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
ERRSC *scale*	ERRSC?	*scale*

■ Parameter

scale

Error range

Value	Error Range	Initial value
5	5%	*
10	10%	
20	20%	
OFF	Off	

■ Restrictions

- Trace Format must be set to Constellation beforehand (*cf.* TRFORM).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the error scale to 20%.

<Program>

MEAS MODANAL

TRFORM CONSTEL

ERRSC 20

ERRSC?

<Response>

20

EXEVMORGOFST

■ Function

Exclude EVM Origin Offset for Modulation Analysis.
Set whether the Origin Offset should be eliminated for EVM Measurement. The initial value is set to include the Origin Offset that implemented in relation to 3GPP TS 34.121 5.13.1 EVM.

■ Syntax

Program Message	Query Message	Response Message
EXEVMORGOFST *on_off*	EXEVMORGOFST?	*on_off*

■ Parameter

on_off
Whether excluding origin offset to calculate EVM.

Value	Specification of Origin Offset	Initial value
ON	EVM result is excluding Origin Offset.	
OFF	EVM result is including Origin Offset.	*

■ Restrictions

- This setting is disabled when the displayed measurement screen is other than the Modulation Analysis screen. (*cf.* DSPL)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Exclude EVM Origin Offset.
<Program>
DSPL MODANAL
SWP
EXEVMROGOFST ON
EXEVMROGOFST?

<Response>
ON

FILTER

■ Function

Filter

Specifies whether or not to perform Root-Nyquist filtering before analysis and measurement on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
FILTER *on_off*	FILTER?	*on_off*

■ Parameter

on_off

Specification of filtering On/Off

Value	Specification of Filtering	Initial Value
ON	Performs Root-Nyquist filtering.	*
OFF	Does not perform Root-Nyquist filtering.	

■ Restrictions

- This setting is disabled when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)

■ Initialization command

*RST

■ Use example

Perform filtering.

<Program>

DSPL SETCOM

FILTER ON

FILTER?

<Response>

ON

FILTERPWR

■ Function

Filtered Power

Outputs the measured results of the average power which is processed by Root-Nyquist filtering at Transmitter Power measurement

■ Syntax

Program Message	Query Message	Response Message
---	FILTERPWR? *unit*	*filteredpower*

■ Parameter

unit

Specification of output unit

Value	Output Unit
DBM	dBm
WATT	W

filteredpower

Resolution	Unit
0.01	dBm
0.001	W

■ Use example

Reads out the measurement result of Filtered Power.

<Program>

DSPL RFPWR,FILTER

SWP

FILTERPWR? DBM

<Response>

23.87

FLTTYPE_MOD

■ Function

Filter Type for Modulation Analysis
Select filter measure Total Power of each slot on Modulation Analysis screen.

■ Suffix

Program Message	Query Message	Response Message
FLTTYPE_MOD *a*	FLTTYPE_MOD?	*a*

■ Parameter

Value of a
Selection of a filter

Value	Filter Type	Initial Value
TXPOWER	Tx Power: Filtered by BW = 5 MHz filter.	
RRCFILTER	Filtered Power: Filtered by RRC filter.	*

■ Parameter

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Filtered Power.
<Program>
DSPL MODANAL
FLTTYPE_MOD RRCFILTER
FLTTYPE_MOD?

<Response>
RRCFILTER

FLTTYPE_RFPWR

■ Function

Filter Type for Transmitter Power

Selects filter measure Total Power of each slot when Measure Method is TPC on Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
FLTTYPE_RFPWR *a*	FLTTYPE_RFPWR?	*a*

■ Parameter

Value of a

Selection of a filter

Value	Filter Type	Initial Value
TXPOWER	Tx Power: Filtered by BW = 5 MHz filter.	
RRCFILTER	Filtered Power: Filtered by RRC filter.	*

■ Restrictions

- This setting is possible only when Measure Method is set to TPC (*cf.* DSPL).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Filtered Power.

<Program>

```
DSPL RFPWR,TPC
FLTTYPE_RFPWR RRCFILTER
FLTTYPE_RFPWR?
```

<Response>

```
RRCFILTER
```

FLTTYPE_SMASK

■ Function

Filter Type for Spectrum Emission Mask

Selects filter used for power measurement at Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
FLTTYPE_RFPWR *a*	FLTTYPE_RFPWR?	*a*

■ Parameter

Value of a

Selection of a filter

Value	Filter Type	Initial Value
TXPOWER	Tx Power: Filtered by BW = 5 MHz filter.	
RRCFILTER	Filtered Power: Filtered by RRC filter.	*

■ Use example

Sets Filtered Power.

<Program>

DSPL_SMASK

FLTTYPE_SMASK RRCFILTER

FLTTYPE_SMASK?

<Response>

RRCFILTER

FREQ

■ Function

Frequency

Sets the carrier frequency for the frequency targeted to be measured.

■ Syntax

Program Message	Query Message	Response Message
FREQ *freq*	FREQ?	*freq*

■ Parameter

freq

Carrier frequency

Range	Model	Resolution	Initial value	Unit
100 to 7800000000	MS8608A	1	1920000000	Hz
100 to 13200000000	MS8609A	1	1920000000	Hz
100 to 3000000000	MS2681A	1	1920000000	Hz
100 to 7800000000	MS2683A	1	1920000000	Hz
100 to 30000000000	MS2687A/B	1	1920000000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHz, GZ: GHz

■ Restrictions

- This setting is not enabled when Terminal is not set to RF. (*cf.* TERM).

■ Initialization command

*RST

■ Use example

Sets the carrier frequency to 1 GHz.

<Program>

TERM RF

FREQ 1GHZ

<Response>

1000000000

FRMDM

■ Function

Sets the demodulation range at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
FRMDM ON, *limit*	FRMDM	*ON, limit*
FRMDM *OFF*	FRMDM	*OFF*

■ Parameter

on_off

Setting frame demodulation output to On/OFF

Value	Frame Demodulation Output to On/Off	Initial value
ON	Set the frame demodulation output.	*
OFF	Does not set frame demodulation output.	

limit

Demodulation range

Value	Resolution	Initial value	Unit
0,1 to 10	1	1	Frame

- 0 is only a response value. 0 cannot be set.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the frame demodulation range to 5.

<Program>

DSPL DEMOD

FRMDM ON,5

FRMDM?

<Response>

ON, 5

FSPAN_ADJ

■ Function

Frequency Span for Adjacent Channel Power

Outputs the frequency span at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	FSPAN_ADJ	*freq*

■ Parameter

freq

Frequency span

Resolution	Unit
100000	Hz

■ Use example

Reads out the frequency span at Adjacent Channel Power measurement

<Program>

DSPL ADJ,SPECT1

SWP

FSPAN_ADJ?

<Response>

25000000

FSPAN_OBW

■ Function

Frequency Span for Occupied Bandwidth
Outputs the measurement frequency span at Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
---	FSPAN_OBW?	*freq*

■ Parameter

freq

Frequency span

Resolution	Unit
100000	Hz

■ Use example

Reads out the span on the Occupied Bandwidth screen.

<Program>
DSPL OBW,FFT
SWP
FSPAN_OBW?

<Response>
10000000

FSPAN_SMASK

■ Function

Frequency Span for Spectrum Emission Mask
Outputs the measurement frequency span at Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
---	FSPAN_SMASK?	*a*

■ Value of a

Frequency span

Resolution	Unit
1	Hz

■ Value of a

- 25 MHz is always returned. This setting cannot be changed.

■ Use example

To read the span in the Spectrum Emission Mask screen.
<Program>
DSPL SMASK
FSPAN_SMASK?

<Response>
25000000

HSCALE_CCDF

■ Function

Horizontal Scale for CCDF
Sets horizontal scale of trace at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
HSCALE_CCDF *a*	HSCALE_CCDF?	*a*

■ Parameter

Value of a
Setup Trace

Value	Horizontal Scale Maximum Value (Absolute Value)	Initial value
2	2 dB	
5	5 dB	
10	10 dB	
20	20 dB	*
50	50 dB	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Horizontal scale to 2 dB.
<Program>
DSPL CCDF,CCDF
HSCALE_CCDF 2
HSCALE_CCDF?

<Response>
2

ILVL

■ Function

I Level (RMS)

Reads out the measured results of the I-signal RMS value on the IQ Level screen.

■ Syntax

Program Message	Query Message	Response Message
---	ILVL? *unit*	*rms*

■ Parameter

unit

Readout unit

Value	Readout Unit
None	Current set unit (*cf.* UNIT_IQL)
MV	mV
DBMV	dBmV

rms

RMS value of I signal

Resolution	Unit
0.01	Depends on the value specified by *unit*.

■ Use example

Reads out the I Level (RMS) value.

<Program>

MEAS IQLVL

ILVL? MV

<Response>

1.42

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

INI

■ Function

Initialize

Initializes all the measurement control parameters to be enabled for initialization. This command functions the same as the PRE and IP commands.

■ Syntax

Program Message	Query Message	Response Message
INI	---	---

■ Use example

Initializes all the parameters to be enabled for initialization.

<Program>

INI

INPLVL

■ Function

Slot 1 input level

Sets the input signal level for TPC slot 1.

■ Syntax

Program Message	Query Message	Response Message
INPLVL *level*	INPLVL?	*level*

- *Offset* is offset value of reference level (*cf.* RFLVLOFS).

■ Parameter

level

Signal level of slot 1

Range	Resolution	Initial value	Unit
(−70 + Offset) to (50 + Offset)	0.01	0.00	dBm

□Suffix code

None: dBm

DBM: dBm

■ Restrictions

- Terminal must be set to RF beforehand. (*cf.* TERM)

■ Initialization command

PRE, INI, IN, ∗RST

■ Use example

Sets the Input Level of Slot 1 to 4.50 dBm.

<Program>

DSPL SETCOM

RFLVLOFS 0.00

DSPL SETTPC

INPLVL 4.50

INPLVL?

<Response>

4.50

INTPOL

■ Function

Interpolation for Constellation

Sets the interpolation display when Trace Format is set to Constellation at the Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
INTPOL *a*	INTPOL?	*a*

■ Value of a

Interpolation display

Value	Interpolation mode	Initial Value
NON	Non: Displays only the symbol points.	*
LIN	Linear: Displays the linearity interpolated points	
POINT 10	10points: Displays the interval between the 2 symbol points interpolated by 10 segments.	
LINSYM	Linear & Symbol Position: Displays the symbol points and the linearly interpolated symbol points.	
P10SYM	10points & Symbol Position: Displays the symbol points and the interval between 2 symbol points interpolated by 10 segments.	

■ Restrictions

- No setting is allowed when Trace Format is set to other than Constellation (*cf.* TRFORM).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Linearly interpolating the symbol points.

<Program>

TRFORM CONSTEL

INTPOL LIN

INTPOL?

<Response>

LIN

INTVAL_ADJ

■ Function

Refresh Interval for Adjacent Channel Power

Sets the display updating interval when Storage Mode is set to Average at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_ADJ *intval*	INTVAL_ADJ?	*intval*

■ Parameter

intval

Updating interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS ADJ,MOD

INTVAL_ADJ ONCE

INTVAL_ADJ?

<Response>

ONCE

INTVAL_IQL

■ Function

Refresh Interval for IQ Level

Sets the display updating interval when Storage Mode is set to Average at IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_IQL *intval*	INTVAL_IQL?	*intval*

■ Parameter

intval

Updating interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS IQLVL

INTVAL_IQL ONCE

INTVAL_IQL?

<Response>

ONCE

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

INTVAL_MOD

■ Function

Refresh Interval for Modulation Analysis

Sets the display updating interval when Storage Mode is set to Average at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_MOD *intval*	INTVAL_MOD?	*intval*

■ Parameter

intval

Updating interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS MODANAL

INTVAL_MOD ONCE

INTVAL_MOD?

<Response>

ONCE

INTVAL_OBW

■ Function

Refresh Interval for Occupied Bandwidth

Sets the display updating interval when Storage Mode is set to Average at Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_OBW *intval*	INTVAL_OBW?	*intval*

■ Parameter

intval

Updating interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS OBW,SPECT

INTVAL_OBW ONCE

INTVAL _OBW?

<Response>

ONCE

INTVAL_RFPWR

■ Function

Refresh Interval for Transmitter Power

Sets the display updating interval when Storage Mode is set to Average at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_RFPWR *Intval*	INTVAL_RFPWR?	*Intval*

■ Parameter

Intval

Updating interval

Value	Updating Interval	Initial Value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS RFPWR,SPECT

INTVAL_RFPWR ONCE

INTVAL_RFPWR?

<Response>

ONCE

INTVAL_SMASK

■ Function

Refresh Interval for Spectrum Emission Mask

Sets the display updating interval when Storage Mode is set to Average at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_SMASK *a*	INTVAL_ SMASK?	*a*

■ Value of a

Updating interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the updating interval to Once.

<Program>

MEAS SMASK,SPECT

INTVAL_ SMASK ONCE

INTVAL _ SMASK?

<Response>

ONCE

INTVAL_SPU

■ Function

Refresh Interval for Spurious Emission

Sets the display updating interval when Storage Mode is set to Average at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
INTVAL_SPU *intval*	INTVAL_SPU?	*intval*

■ Parameter

intval

Updating Interval

Value	Updating Interval	Initial value
EVERY	Updates the display after every one sweep. Calculates and displays the average value by the number of measurements repeated by that sweep.	*
ONCE	Updates the display once after completion of averaging. Calculates the average value by the times specified with Average Count.	

■ Initialization command

PRE, INI, IP, *RST

■ Initialization command

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the updating interval to Once.

<Program>

MEAS SPURIOUS, SWEEP

INTVAL_SPU ONCE

INTVAL_SPU?

<Response>

ONCE

IP

■ Function

Preset

Initializes all the measurement control parameters to be enabled for initialization. This command functions the same as the PRE and INI commands.

■ Syntax

Program Message	Query Message	Response Message
IP	---	---

■ Use example

Initializes all the parameters to be enabled for initialization.

<Program>

IP

IPPLVL

■ Function

I Level (Peak to Peak)

Reads out the measured results of the Peak-to-Peak value for I signal in IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
---	IPPLVL? *unit*	*pp*

■ Parameter

unit

Readout unit

Value	Readout unit
None	Current set unit
MV	mV
DBMV	dBmV

pp

Peak-to-Peak value for I signal

Resolution	Unit
0.01	Set value for *unit*.

■ Use example

Reads out the I Level (Peak to Peak) value

<Program>

MEAS IQLVL

IPPLVL? MV

<Response>

4.07

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

IQINZ

■ Function

IQ Impedance

Sets the input impedance for I/Q signals on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
IQINZ *r*	IQINZ?	*r*

■ Parameter

r

Impedance

Value	Impedance	Initial Value
50	50 Ω	*
1 M	1 MΩ	

■ Restrictions

- The setting is not enable when the measurement screen is not the Setup Common Parameter screen. (*cf.* DSPL).
- The setting is not enable when Terminal is set to one other than IQ-AC, IQ-DC, or IQ-Balance. (*cf.* TERM).

■ Use example

Reads out I Level (Peak to Peak) value.

<Program>

DSPL SETCOM

TERM IQAC

IQINZ 50

IQINZ?

<Response>

50

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is installed.

IQLVL

■ Function

IQ Level

Reads out the measured results of the RMS values and the Peak-to-Peak values for I and Q signals at IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
---	IQLVL? *unit*	*Irms,Qrms,Ipp,Qpp*

■ Parameter

unit

Readout unit

Value	Readout unit
None	Current set unit (*cf.* UNIT_IQL)
MV	mV
DBMV	dBmV

Irms : RMS value for I signal

Resolution	Unit
0.01	Set value for *unit*.

Qrms : RMS value for Q signal

Resolution	Unit
0.01	Set value for *unit*.

Ipp : Peak-to-Peak value for I signal

Resolution	Unit
0.01	Set value for *unit*.

Qpp : Peak-to-Peak value for Q signal

Resolution	Unit
0.01	Set value for *unit*.

■ Use example

Reads out the IQ Level value.

<Program>

MEAS IQLVL

IQLVL? MV

<Response>

1.42,0.53,4.07,3.55

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

IQPHASE

■ Function

IQ Phase difference

Reads out the measured results of the phase difference between IQ signals at IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
---	IQPHASE?	*phase*

■ Parameter

phase

Phase difference between IQ signals

Resolution	Unit
0.01	deg

■ Use example

Reads out the phase difference between IQ signals.

<Program>

MEAS IQLVL

IQPHASE?

<Response>

99.97

■ Restrictions according to model type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

JALLTPC

■ Function

Sets the Judgment function for each slot to On or Off at TPC measurement.

■ Syntax

Program Message	Query Message	Response Message
JALLTPC *on_off*	JALLTPC?	*on_off*

■ Parameter

on_off

Setting Judgment function to On or Off

Value	Setting Judgment Function to On/Off	Initial Value
ON	Makes a judgment.	
OFF	Does not make a judgment.	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the TPC Judgment function to On.

<Program>

DSPL SETTPC

JALLTPC ON

JALLTPC?

<Response>

ON

JUDGUNIT_SPTBL

■ Function

Judge Unit for Spurious Emission (Spot)
Switches the judgment unit at Spurious Emission measurement (Spot).

■ Syntax

Program Message	Query Message	Response Message
JUDGUNIT_SPTBL *on_off*	JUDGUNIT_SPTBL?	*on_off*

■ Parameter

on_off
Setting judgment function to On or Off

Value	Setting Judgment Function to On or Off	Initial Value
ABS	Absolute: Judges by dBm.	*
ON		
REL	Absolute: Judges by dB.	
OFF		
RELABS	Relative & Absolute: Judges by the severer one of the conditions of dBm and dB.	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- ABS, REL and RELABS can be used only when the using measurement system is MX860x01B /MX268x01B.

■ Use example

Sets Judge Unit to Relative.
<Program>
DSPL SPURIOUS, SPOT
JUDGUNIT_SPTBL ON
JUDGUNIT_SPTBL?

<Response>
ON

JUDGUNIT_SWTBL

■ Function

Judge Unit for Spurious Emission (Sweep, Search)
Switch the judgment unit at Spurious Emission measurement (Sweep).

■ Syntax

Program Message	Query Message	Response Message
JUDGUNIT_SWTBL *on_off*	JUDGUNIT_SWTBL?	*on_off*

■ Parameter

on_off
Setting judgment function to On or Off

<table>
<tr><th>Value</th><th>Setting Judgment Function to On or Off</th><th>Initial Value</th></tr>
<tr><td>ABS</td><td rowspan="2">Absolute: Judges by dBm.</td><td rowspan="2">*</td></tr>
<tr><td>ON</td></tr>
<tr><td>REL</td><td rowspan="2">Absolute: Judges by dB.</td><td rowspan="2"></td></tr>
<tr><td>OFF</td></tr>
<tr><td>RELABS</td><td>Relative & Absolute: Judge by the severer one of the conditions of dBm and dB.</td><td></td></tr>
</table>

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- ABS, REL and RELABS can be used only when the using measurement system is MX860x01B /MX268x01B.

■ Use example

Sets Judge Unit to Relative.
<Program>
DSPL SPURIOUS,SWEEP
JUDGUNIT_SWTBL ON
JUDGUNIT_SWTBL?

<Response>
ON

LOADMLTCALDATA

■ Function

Load Multi Carrier Calibration data
Loads Correction Factor to use for Multi Carrier Calibration from PC Card.

■ Syntax

Program Message	Query Message	Response Message
LOADMLTCALDATA	---	---

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.
- This command is available only when MS8609A-33 is installed.
- This setting is not possible when Terminal is set to other than RF. (*cf.* TERM)

■ Use example

Executes “Load Multi Carr. Cal. Data.”
<Program>
DSPL MODANAL
LOADMLTCALDATA

LVLREL_RFPWR

■ Function

Level Relative/Absolute for Transmitter Power

Selects whether vertical scale unit of Total Waveform is set to dB or dBm at Transmitter Power measurement when Measure Method is set to TPC.

■ Syntax

Program Message	Query Message	Response Message
LVLREL_RFPWR *on_off*	LVLREL_RFPWR?	*on_off*

■ Parameter

on_off

Unit (Relative/Absolute)

Value	Vertical Scale unit	Initial Value
ON	Displays by dB.	*
OFF	Displays by dBm.	

■ Restrictions

- This setting is enabled only when Measure method is set to TPC. (*cf.* DSPL).
- This command is available only for MX860x01B/MX268x01B.

■ Use example

Sets unit to dB.

<Program>

DSPL RFPWR,TPC

LVLREL_RFPWR ON

LVLREL_RFPWR?

<Response>

ON

MAGTDERR

■ Function

RMS Magnitude Error

Outputs a measured results of the Magnitude Error RMS value at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MAGTDERR?	*rms*

■ Parameter

rms

RMS value of Magnitude Error

Resolution	Unit
0.01	%

■ Use example

Reads out the measured results for Magnitude Error.

<Program>

DSPL MODANAL

SWP

MAGTDERR?

<Response>

16.67

MAXSF

■ Function

Maximum Spreading Factor of Down Link for Modulation Analysis
Switches the Max Spreading Factor.

■ Syntax

Program Message	Query Message	Response Message
MAXSF *a*	MAXSF?	*a*

■ Value of a

Maximum value of Spreading Factor

Value	Max Spreading Factor 256/512	Initial Value
256	Analyze as a signal with a Max Spreading Factor of 256.	
512	Analyze as a signal with a Max Spreading Factor of 512.	*

☐ Suffix code

None

■ Restrictions

- Maximum Spreading Factor can be set when Measuring Object is set to Down Link (*cf.* MEASOBJ).

■ Initialization command

PRE, INI, IP, *RST

■ Use command

To set Maximum Spreading Factor to 256.

<Program>
DSPL SETCOM
MEASOBJ DNLNK
MAXSF 256
MAXSF?

<Response>
256

MEAS

■ Function

Sets the measurement screen and measurement method, and starts measurement.
When the previous measurement is not a continuous measurement, a Single measurement is executed. On the other hand, when the previous measurement is a continuous one, a continuous measurement is executed.

■ Syntax

Program Message	Query Message	Response Message
MEAS *meas, mode*	MEAS?	*meas, mode*
MEAS *meas*	MEAS?	*meas*

■ Parameter

meas: Measurement screen name *mode*: Measurement method/Template type

<table>
<tr><th>Meas Value</th><th>Measurement Screen Name</th><th>Value of mode</th><th>Measurement method/ Template type</th><th>Initial value</th><th>Input terminal (->TERM)</th></tr>
<tr><td>SETCOM</td><td>Setup Common Parameter</td><td>None</td><td>---</td><td>*</td><td rowspan="12">RF,
IQ-DC
IQ-AC
IQ-Balance</td></tr>
<tr><td>MODANAL</td><td>Modulation Analysis</td><td>None</td><td>---</td><td></td></tr>
<tr><td>DEMOD</td><td>Demodulation Data</td><td>None</td><td>---</td><td></td></tr>
<tr><td rowspan="5">RFPWR</td><td rowspan="5">RF Power</td><td>FILTER</td><td>Filtered Power & Tx Power</td><td></td></tr>
<tr><td>RRCFILTER</td><td>Filtered Power</td><td></td></tr>
<tr><td>NONFILTER</td><td>Tx Power</td><td></td></tr>
<tr><td>TPC</td><td>TPC</td><td></td></tr>
<tr><td>RACH</td><td>RACH</td><td></td></tr>
<tr><td>SETTPC</td><td>Setup TPC</td><td>None</td><td>---</td><td></td></tr>
<tr><td>SETTPC2</td><td>Setup TPC2</td><td>None</td><td>---</td><td></td></tr>
<tr><td rowspan="2">CCDF</td><td rowspan="2">CCDF</td><td>CCDF</td><td>CCDF</td><td></td></tr>
<tr><td>APD</td><td>APD</td><td></td></tr>
<tr><td rowspan="3">OBW</td><td rowspan="3">Occupied Bandwidth</td><td>SPECT</td><td>Spectrum</td><td></td><td>RF</td></tr>
<tr><td>FFT</td><td>FFT</td><td></td><td rowspan="2">RF,
IQ-DC,
IQ-AC,
IQ-Balance</td></tr>
<tr><td>HIGH</td><td>FFT</td><td></td></tr>
</table>

(Continued.)

Meas Value	Measurement Screen Name	Value of mode	Measurement method/ Template type	Initial value	Input terminal (->TERM)
ADJ	Adjacent Channel Power	SPECT1	Spectrum (All)		RF
		SPECT			
		SPECT2	Spectrum (Separate)		
		MOD	Modulation		
SPURIOUS	Spurious	SPOT	Spot		
		SEARCH	Search		
		SWEEP	Sweep		
SETTBL_ SPU	Setup Frequency Table for Spurious Emission	SPOT	Spot		
		SWEEP	Sweep		
SMASK	Spectrum Emission Mask	None	---		
SETTEMP_ SMASK	Setup Spectrum Emission Mask Template	None	---		
PWRMTR	Power Meter	None	---		
IQLVL	IQ Level	None	---		IQ-DC IQ-AC IQ-Balance

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This function, RACH, APD and CCDF, are available only for MX860x01B/MX268x01B.
- For MS268x, Changing to IQ Level Screen is not allowed when Option -17 or -18 is not installed.
- For MX268x, Changing to Power Meter Screen is not allowed.

■ Use example

[1] Moves the screen to the Modulation Analysis screen to perform a measurement.

<Program>
MEAS MODANAL
MEAS?

<Response>
MODANAL

[2] Moves the screen to the Spurious Emission screen to perform a Sweep measurement.

<Program>
MEAS SPRIOUS,SWEEP
MEAS?

<Response>
SPRIOUS,SWEEP

MEASOBJ

■ Function

Measuring Object

Sets the type of signal for the measurement target (Measuring Object) on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
MEASOBJ *object*	MEASOBJ?	*object*

■ Parameter

object

Measuring Object

Value	Measuring Object	Initial value
UPLNK	Up Link	*
UPLNKRACH	Up Link (RACH)	
DNLNK	Down Link	
DNLNKCOMP	Down Link(Compress)	
QPSK	QPSK	

■ Restrictions

- The measurement screen displayed must be set to the Setup Common Parameter screen (*cf.* DSPL).
- UPLNKRACH and DNLNKCOMP can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

*RST

■ Use example

Sets the Measuring Object to Down Link.

<Program>

MEASOBJ DNLNK

MEASOBJ?

<Response>

DNLNK

MKCDP

■ Function

Marker Level for Modulation Analysis (Code Domain)
Reads out the Code Domain Power at the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDP? *phase*	*pwr*

■ Parameter

phase
Signal type

Value	Signal Type	Measuring Object (*cf.* MEASOBJ)
None	Signal specified by Operation Phase (at Up Link) or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

pwr
Code Domain Power

Resolution	Unit
0.01	dB

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)
- *** is read out when Trace Format is set to other than Code Domain. (*cf.* TRFORM)
- *** is read out when Marker Mode is set to OFF. (*cf.* MKR_MOD)

■ Use example

Reads out the Code Domain Power on the 76th I signal when Measuring Object is at Up Link.
<Program>

```
MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
SF_CDP 128,I
MKR_MOD NRM
MKR_CDP 76,I
SWP
MKCDP?
```

<Response>
−22.08

MKCDPABS

■ Function

Marker Level for Code Domain Power
Reads out Code Domain Power (absolute) at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDPABS? *a*	*b*

■ Value of a

Signal type

Value	Signal Type	Measurement Object
None	Signal specified by Operation Phase (at Up Link) or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

■ Value of b

Code Domain Power (absolute)

Resolution	Unit
0.01	dBm

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- Value of a setting is not possible when Measuring Object is set to Down Link or Down Link (Compress).

■ Use example

Reads out the Code Domain Power (absolute).
<Program>
DSPL MODANAL
TRFORM CODE
SWP
MKCDPABS?

<Response>
−49.42

MKCDPERR

■ Function

Marker Level for Code Domain Error

Reads out the Code Domain Error at the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDPERR? *phase*	*err*

■ Parameter

phase

Signal type

Value	Signal Type	Measurement Object (*cf.* MEASOBJ)
None	Signal specified by Operation Phase (at Up Link) or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

err

Code Domain Error

Resolution	Unit
0.01	dB

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)
- *** is read out when Trace Format is set to other than Code Domain. (*cf.* TRFORM)
- *** is read out when Marker Mode is set to Off. (*cf.* MKR_MOD)

■ Use example

Reads out the code domain error on the 76th I signal when Measuring Object is at Up Link.

<Program>

```
MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
SF_CDP 128,I
MKR_MOD NRM
MKP_CDP 76,I
SWP
MKCDPERR? I
```

<Response>
−25.34

MKCDVSTM

■ Function

Code Domain Power in Slot Duration for Code vs Time

Outputs Code Domain Power is slot of the marker position when Trace Format is set to Code vs. Time.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDVSTM? *a*	*b,c*
---	MKCDVSTM? *a,REL*	*b*
---	MKCDVSTM? *a,ABS*	*c*

■ Parameter

Value of a

Setup Channel

Value	Measuring Object	Setup Channel
0	Down Link	Output Total Power in slot filtered by the filter selected in Filter Type (cf. FLTTYPE_MOD).
1		Output Code Domain Power of set-up channel.
0	Down Link (Compress)	Output Total Power in slot filtered by the filter selected in Filter Type (cf. FLTTYPE_MOD).
1		Output Code Domain Power for Normal Frame of setup Channel.
2		Output Code Domain Power for Compressed Frame of setup Channel.
0	Up Link	Output Total Power in slot filtered by the filter selected in Filter Type (cf. FLTTYPE_MOD).
1		Output Code Domain Power is set-up I-phase channel.
2		Output Code Domain Power is set-up Q-phase channel.

Value of b

Power of setup channel (Relative Value)

Resolution	Unit
0.01	dB

Value of c

Power of setup channel (Absolute Value)

Resolution	Unit
0.01	dB

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Relative Power and Absolute Power in slot 4 of Compressed Frame.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNKCOMP
TRFORM CDVSTM
SWP
MKPSLT_CDVSTM 4
MKCDVSTM? 2
```

<Response>

−1.59, 0.84

MKCDVSTMCARRFERR

■ Function

Frequency Error in Slot Duration for Code vs Time
Outputs Frequency Error is slot of the marker points when Trace Format is set to Code vs. Time.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDVSTMCARRFERR? *unit*	*freq*

■ Parameter

Value of unit
Readout unit

Value	Readout Unit
None	Hz
HZ	Hz
PPM	ppm

Value of freq
Frequency Error of the marker points of slot. The unit depends on the parameter "unit."

Resolution	Unit
0.1	Hz
0.001	ppm

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Frequency Error in slot 4 in Hz unit.
<Program>
DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
SWP
MKPSLT_CDVSTM4
MKCDVSTMCARRFERR? HZ

<Response>
10.1

MKCDVSTMSCCODENO

■ Function

Scrambling code number in Slot Duration for Code vs Time

Outputs the scrambling code number of the slot the marker points when Trace Format is set to Code vs. Time at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKCDVSTMSCCODENO?	*a*

■ Parameter

Value of a

Scrambling code number of the marker points of slot.

Resolution	Unit
1	None

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out the scrambling code number in slot 4.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

SWP

MKPSLT_CDVSTM 4

MKCDVSTMSCCODENO?

<Response>

00070

MKDEMOD

■ Function

Marker Data for Demodulation

Read out Demodulation Data in marker position at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKDEMOD? *a*	*b*

■ Parameter

Value of a

Output Format

Value	Output Format
None	Output by decimal.
DEC	Output by decimal.
HEX	Output by hexadecimal.

Value of b

Demodulation Data

Value	Resolution	Output Format
0 to 65535	1	Decimal
0 to FFFF	1	Hexadecimal

■ Restrictions

- This setting is not enabled when Measuring Object is QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Demodulation Data in slot 5 (10 byte) when Measuring Object is Up Link.

<Program>

MEASOBJ UPLNK

DSPL DEMOD

MKP_DEMOD 5

SWP

MKDEMOD?

<Response>

10011

MKL_ADJ

■ Function

Marker Level for Adjacent Channel Power
Reads out the power on the marker position at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_ ADJ? *unit*	*pwr*

■ Parameter

unit
Unit

Value	Readout Unit
None	Current set unit (*cf.* UNIT_ADJ). However, Watt value is used for mW, μW, and nW units.
DB	dB
DBM	dBm
WATT	W

pwr
Power

Resolution	Unit
0.01	dB

■ Restrictions

- *** is output when Measure Method is set to other than Spectrum (All). (*cf.* DSPL)
- *** is output when Marker is set to Off. (*cf.* MKR_ADJ)

■ Use example

Reads out the power at the frequency of 3.05 MHz.
<Program>
MEASOBJ UPLNK
DSPL ADJ,SPECT1
MKR_ADJ NRM
MKRS_ADJ 3.05MHZ
SWP
MKL_ADJ?

<Response>
−34.19

MKL_CCDF

■ Function

Marker Value for CCDF

Outputs the power distribution and probability on the marker position at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_CCDF? *a,b*	*c*

■ Parameter

Value of a

Output waveform

Value	Output Waveform
0	Outputs value of measurement waveform
1	Outputs value of saved waveform. Outputs 0 value when the waveform is not saved.
2	Outputs the value of Gaussian Trace waveform.
All	Outputs value in order of measurement waveform and saved waveform.

Value of b

Output format

Value	Output Format
PROB	Outputs value of Power Distribution (x-coordinate).
DSTRBT	Outputs value of Probability (y-coordinate).

Value of c

Setup value in b

Resolution	Unit	Output Format
0.1	dB	Power Distribution
0.0001	%	Probability

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out measurement results of probability on the marker position of measurement waveform.

<Program>

DSPL CCDF,CCDF
SWP
MKL_CCDF? 0,Y

<Response>

0.5012

MKL_MOD

■ Function

Marker Level for Modulation Analysis

Outputs the each measured value at marker position when Trance Format is set to Constellation, Eye Diagram, EVM, Phase Error or Magnitude Error at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_MOD? *phase*	*level*

■ Parameter

phase

Signal type

Value	Signal Type	Trace Format (*cf.* TRFORM)
None	None	EVM, Phase Error, Magnitude Error
I	I signal	Constellation, Eye Diagram
Q	Q signal	Constellation, Eye Diagram

level

Marker Level

Resolution	Unit	Trace Format (*cf.* TRFORM)
0.0001	None	Constellation, Eye Diagram
0.01	%	EVM, Magnitude Error
0.01	deg	Phase Error

■ Restrictions

- *** is read out when Trace Format is set to than Constellation, Eye Diagram, EVM, Phase Error or Magnitude Error. (*cf.* TRFORM).
- *** is read out when Marker is set to Off (*cf.* MKR_MOD).

■ Use example

Reads out the value at chip point 768.0 on I signal in the Constellation mode.

<Program>

DSPL MODANAL

TRFORM CONSTEL

MKR_MOD NRM

SWP

MKP_MOD 768.0

MKL_MOD?

<Response>

−0.2889

MKL_RFPWR

■ Function

Marker Level for Transmitter Power

Outputs the power on the marker position at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_RFPWR?	*pwr*

■ Parameter

pwr

Power

Resolution	Unit
0.01	dBm

■ Restrictions

- *** is output when Measure Method is set to TPC. (*cf.* DSPL)
- *** is output when Waveform Display is set to Off. (*cf.* WAVEFORM)
- *** is output when Marker is set to Off. (*cf.* MKR_RFPWR)

■ Use example

Reads out the Power at 500.0 μsec.

<Program>

DSPL RFPWR,FILTER
SWP
WAVEFORM ON
MKR_RFPWR NRM
MKP_RFPWR 500.0
MKL_RFPWR?

<Response>

20.55

MKL_SMASK

■ Function

Marker Level for Spectrum Emission Mask

Reads the measured value at the marker position on the Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_SMASK? *a*	*b*

■ Value of a

Output unit

Value	Output unit
None	Depends on Unit setting.
DB	dB
DBM	dBm
WATT	W

■ Value of b

Marker Level

Resolution	Unit
0.01	dBm
0.01	dB
Significant digits: 4 digits (floating point format)	W

■ Use example

To read the level at offset frequency of 2.512 MHz.

<Program>

DSPL SMASK

MKN_SMASK 2.512MHZ

SWP

MKL_SMASK? DB

<Response>

−34.08

MKL_SPU

■ Function

Marker Level for Spurious Emission

Reads out the power value on the marker position at Spurious Emission.

■ Syntax

Program Message	Query Message	Response Message
---	MKL_SPU? *Ftable_no,wave_type,unit*	*pwr*

■ Parameter

table_no

Read out the frequency table number

Range	Resolution
1 to 15	1

wave_type

Waveform type

Value	Waveform type
0	Sweep waveform of frequency axis.
1	Sweep waveform of time axis.

unit

Readout unit

Value	Readout unit
None	Currently set unit (cf. UNIT_SPU)
DB	dB
DBM	dBm

pwr

Marker Level

Resolution	Output unit
0.01	dBm
0.01	dB

■ Restrictions

- *** is read out when there is not waveform data.
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out power value on the marker position of sweep waveform of frequency axis on frequency table 1.

<Program>
DSPL SPURIOUS, SEARCH
SWP
MKL_SPU? F1,0,DBM

<Response>
−34.19

MKLEXPND_RFPWR

■ Function

Marker Level (expand) for Transmitter Power

Reads out Power of Expand Waveform on the marker position at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKLEXPND_RFPWR? *window*	*pwr*

■ Parameter

window

Object Window

Value	Object Window
None	Window selected now, or
LEAD	Leading Window
TRAIL	Trailing Window

pwr

Power

Resolution	Output unit
0.01	dBm

■ Restrictions

- This setting is available only when Measure Method is set to TPC or RACH. (*cf.* DSPL)
- This command is can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Power at 500.0 μsec.

<Program>

DSPL RFPWR,TPC

SWP

MKP_RFPWR 500.0

MKLEXPND_RFPWR?

<Response>

20.55

MKN_ADJ

■ Function

Marker Position for Adjacent Channel Power
Sets the marker position in frequency units on the Adjacent Channel Power screen.
This command functions the same as the MKRS_ADJ command.

■ Syntax

Program Message	Query Message	Response Message
MKN_ADJ *freq*	MKN_ADJ?	*freq*

■ Parameter

freq
Frequency

Range	Resolution	Initial value	Unit
−10600000 to 10600000	50000	0	Hz

□ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz
GHZ, GH: GHz

■ Restrictions

- This setting is possible only when Measure Method is set to Spectrum (All). (*cf.* DSPL)
- This setting is not possible when Marker is set to Off. (*cf.* MKR_ADJ)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Makes a Mark at 3.05 MHz.
<Program>
DSPL ADJ,SPECT1
SWP
MKR_ADJ NRM
MKN_ADJ 3.05MHZ
MKN_ADJ?

<Response>
3050000

MKN_SMASK

■ Function

Marker Position for Spectrum Emission Mask (in frequency)
Specifies the marker position on the Spectrum Emission Mask screen frequency.
This command functions the same as MKRS_SMASK command.

■ Syntax

Program Message	Query Message	Response Message
MKN_SMASK *a*	MKN_SMASK?	*a*

■ Value of a

Position in frequency

Range	Resolution	Initial value	Unit
−12000000 to 12000000	10000	0	Hz

□ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz
GHZ, GZ: GHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker position at 2.51 MHZ.
<Program>
MKN_SMASK 2.51MHZ
MKN_SMASK?

<Response>
2510000

MKP_ADJ

■ Function

Marker Position for Adjacent Channel Power

Sets the marker position by screen coordinates when Measure Method is set to Spectrum (All) on the Adjacent Channel Power screen.

■ Syntax

Program Message	Query Message	Response Message
MKP_ADJ *point*	MKP_ADJ?	*point*

■ Parameter

point

Screen coordinates

Range	Resolution	Initial value	Number of Measurement data
38 to 462	1	250	501
76 to 924	1	500	1001

■ Restrictions

- This setting is possible only when Measure Method is set to Spectrum (All). (*cf.* DSPL)
- This setting is not possible when Marker is set to OFF. (*cf.* MKR_ADJ)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Marks at the 380-pixcel point.

<Program>

DSPL ADJ,SPECT1

SWP

MKR_ADJ NRM

MKP_ADJ 380

MKP_ADJ?

<Response>

380

MKP_CCDF

■ Function

Marker Position for CCDF

Sets the marker position at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
MKP_CCDF *a*	MKP_CCDF?	*a*

■ Parameter

Value of a

Sets the power distribution or probability by setting value of Display Data Type (*cf.* DIPTYPE_CCDF).

Display Data Type	Range	Resolution	Unit
Probability	0.0001 to 100.0000	0.0001	Probability (%)
Distribution	−50.0 to 50.0	0.1	Power distribution(dB)

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.
- When display data type is Distribution, Restrictions of parameter “a” setting range is follows.
  Positive value only when Measure Method is CCDF.
  Max value is setting value of Horizontal Scale.
  Positive value only when Trace Format is Pos. Negative value only when Trace Format is Neg.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets marker position to 10.0 dB.

<Program>
DSPL CCDF
SWP
MKR_CCDF HORIZ
MKP_CCDF? 10.0

<Response>
10.0

MKP_CDP

■ Function

Marker Position for Modulation Analysis (Code Domain)

Specifies the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
MKP_CDP *num,phase*	MKP_CDP? *phase*	*num*

■ Parameter

num

Number of bars counted form the origin of the Code Domain bar graph.

Range	Resolution	Initial Value
0 to the number of bars counted from the origin of the Code Domain bar graph	1	0

phase

Signal specification

Value	Signal	Measuring Object (*cf.*MEASOBJ)
None	Currently set signal	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* value setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)
- This setting is not possible when Trace Format is set to other than Code Domain. (*cf.* TRFORM)
- This setting is not possible when Marker is set to Off. (*cf.* MKR_MOD)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Marks at the 7th I signal.

<Program>

```
MEASOBJ UPLNK
MEAS MODANAL
TRFORM CODE
SWP
MKR_MOD NRM
MKP_CDP 6,I
MKP_CDP?
```

<Response>

```
6
```

MKP_DEMOD

■ Function

Marker Position for Demodulation

Sets the marker position of Demodulation data at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
MKP_DEMOD *a*	MKP_DEMOD?	*a*

■ Parameter

Value of a

Marker position

Range	Initial Value	Resolution	Unit
0.0 to (Refer to Restrictions).	0	1	Chip

■ Restrictions

- This command is can be used only when the using system is MX860x01B/MX268x01B.
- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- This setting range of marker position is changed by using measurement system.

In MX860x01A/MX268x01A,

- In the case of Down Link (The number in parenthesis is Demodulation bit number)

Demodulation Range	Spreading Factor							
	4	8	16	32	64	128	256	512
1 Freme	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)	19 (300)	10 (150)
2 Frame	2400 (38400)	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)	19 (300)
3 Frame	3600 (57600)	1800 (28800)	900 (14400)	450 (7200)	225 (3600)	113 (1800)	57 (900)	29 (450)
4 Frame	4800 (76800)	2400 (38400)	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)
5 Frame	6000 (96000)	3000 (48000)	1500 (24000)	750 (12000)	375 (6000)	188 (3000)	94 (1500)	47 (750)
6 Frame	7200 (115200)	3600 (57600)	1800 (28800)	900 (14400)	450 (7200)	225 (3600)	113 (1800)	57 (900)
7 Frame	8400 (134400)	4200 (67200)	2100 (33600)	1050 (16800)	525 (8400)	263 (4200)	132 (2100)	66 (1050)
8 Frame	9600 (153600)	4800 (76800)	2400 (38400)	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)
9 Frame	10800 (172800)	5400 (86400)	2700 (43200)	1350 (21600)	675 (10800)	338 (5400)	169 (2700)	85 (1350)
10 Frame	12000 (192000)	6000 (96000)	3000 (48000)	1500 (24000)	750 (12000)	375 (6000)	188 (3000)	94 (1500)

- In the case of Up Link (The number in parenthesis is Demodulation bit number)

Demodulation Range	Spreading Factor						
	4	8	16	32	64	128	256
1 Frame	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)	19 (300)	10 (150)
2 Frame	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)	19 (300)
3 Frame	1800 (28800)	900 (14400)	450 (7200)	225 (3600)	113 (1800)	57 (900)	29 (450)
4 Frame	2400 (38400)	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)	38 (600)
5 Frame	3000 (48000)	1500 (24000)	750 (12000)	375 (6000)	188 (3000)	94 (1500)	47 (750)
6 Frame	3600 (57600)	1800 (28800)	900 (14400)	450 (7200)	225 (3600)	113 (1800)	57 (900)
7 Frame	4200 (67200)	2100 (33600)	1050 (16800)	525 (8400)	263 (4200)	132 (2100)	66 (1050)
8 Frame	4800 (76800)	2400 (38400)	1200 (19200)	600 (9600)	300 (4800)	150 (2400)	75 (1200)
9 Frame	5400 (86400)	2700 (43200)	1350 (21600)	675 (10800)	338 (5400)	169 (2700)	85 (1350)
10 Frame	6000 (96000)	3000 (48000)	1500 (24000)	750 (12000)	375 (6000)	188 (3000)	94 (1500)

In MX860x01B/MX268x01B

- In the case of Down Link or Down Link (Compress) (The number in parenthesis is Demodulation bit number.)

Spreading Factor	4	8	16	32	64	128	256	512
Maximum setting range	79	39	19	9	4	2	1	0

- In the case of Up Link (The number in parenthesis is Demodulation bit number.)

Spreading Factor	4	8	16	32	64	128	256
Maximum setting range	39	19	9	4	2	1	0

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker position to of Demodulation data to 0 chip.

<Program>

MEAS DEMOD

SWP

MKP_DEMOD 0

MKP_DEMOD?

<Response>

0

MKP_MOD

■ Function

Marker Position for Modulation Analysis
(Constellation, Eye Diagram, EVM, Phase Error, Magnitude Error)
Specifies the marker position when Trance Format is set to Constellation, Eye Diagram, EVM, Phase Error, or Magnitude Error at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
MKP_MOD *chip*	MKP_MOD?	*chip*

■ Parameter

chip
chip position

Range	Initial Value	Resolution	Trace Format	Unit
0.0 to (Analysis Length −1)	768.0	1.0	Constellation, EVM, Phase Error, Magnitude Error	chip
		0.1	Eye Diagram	

- Set Analysis Length and Trace format using the ANLYLEN and TRFORM commands, respectively.

■ Restrictions

- This setting is not possible when Trace Format is set to other than Constellation, Eye Diagram, EVM, Phase Error or Magnitude Error.
- This setting is not possible when Marker Mode is set to Off (*cf.* MKR_MOD).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker on the 600.0th chip in the Up Link EVM display.
<Program>
DSPL SETCOM
MEASOBJ UPLNK
DSPL MODANAL
SWP
TRFORM EVM
MKR_MOD NRM
MKP_MOD 600.0
MKP_MOD?

<Response>
600.0

MKP_RACH

■ Function

Marker Position for Transmitter Power (RACH)

Specifies the Preamble position when Measure Method is set to RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
MKP_RACH *n*	MKP_RACH?	*n*

■ Parameter

Value of n

Preamble position (number)

Range	Resolution	Initial Value
1 to Total Preamble	1	1

Total Permeable is the total number of Preamble (*cf.* TOTALPREAM).

*** is read out when Total Preamble 0.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Preamble position to first Preamble at Transmitter Power measurement.

<Program>

DSPL RFPWR,RACH

SWP

MKR_RACH 1

MKP_RACH?

<Response>

1

MKP_RFPWR

■ Function

Marker Position for Transmitter Power

Specifies the time of marker position at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
MKP_RFPWR *time*	MKP_RFPWR?	*time*

■ Parameter

time

Time of marker position

Range	Resolution	Unit	Initial Value
−30.0 to 700.0	2.5	μsec	312.5

■ Restrictions

- This setting is not possible when Measure Method is set to TPC (*cf.* TPC)
- This setting is not possible when Waveform Display is set to Off. (*cf.* WAVEFORM)
- This setting is not possible when “Marker Mode for Transmitter Power” is set to Off. (*cf.* MKR_RFPWR)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the position of 500.0 μsec in Transmitter Power measurement.

<Program>

```
DSPL RFPWR,FILTER
WAVEFORM ON
SWP
MKR_RFPWR NRM
MKP_RFPWR 500.0
MKP_RFPWR?
```

<Response>

```
500.0
```

MKP_SMASK

■ Function

Marker Position for Spectrum Emission Mask (in points)
Sets the marker position in points at Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
MKP_SMASK *a*	MKP_SMASK?	*a*

■ Value of a

Marker position

Range	Resolution	Initial value
0 to 2400	1	1200

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker at point 250.
<Program>
DSPL SMASK
SWP
MKP_SMASK 250
MKP_SMASK?

<Response>
250

MKP_SPU

■ Function

Marker Position for Spurious Emission

Sets the marker position per screen coordinates when Waveform Display is set to ON at Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
MKP_SPU *point*	MKP_SPU?	*point*

■ Parameter

point

Marker Position

Value	Resolution	Initial Value
0 to 500	1	Point where marker level is greatest

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker position to 380pixel.

<Program>

DSPL SPURIOUS,SPOT
SWP
WAVEFORM_SPU ON
MKP_SPU 380
MKP_SPU?

<Response>

380

MKPEXPND_RFPWR

■ Function

Expand Waveform Marker Position for Transmitter Power (TPC, RACH)
Sets the marker position of Expand Waveform Trace at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
MKPEXPND_RFPWR *a,b*	MKPEXPND_RFPWR? *b*	*a*

■ Value of a

Marker Position

Measure Method (*cf.* DSPL)	Window (*cf.* WINDOW_RFPWR)	Range	Resolution	Unit	Initial Value
TPC	Slot	−100.00 to 767.00	0.25	μs	335.00
	Leading	−100.00 to 100.00			0.00
	Trailing	567.00 to 767.00			667.00
	Leading & Trailing	−100.00 to 100.00 567.00 to 767.00			0.00 667.00
RACH	Slot	−100.00 to 1167.00	0.25	μs	335.00
	Leading	−100.00 to 100.00			0.00
	Trailing	967.00 to 1167.00			1067.00

■ Value of b

Marker object

Range	Marker object	Window (*cf.* WINDOW_RFPWR)
None	Sets the marker position of Expand Waveform.	Except Leading &Trailing
LEAD		
None	Sets the marker position of Expand Waveform for Leading	Leading & Trailing
LEAD		
TRAIL	Sets the marker position of Expand Waveform for Trailing	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets the marker position to 10.00 μs.

<Program>

```
DSPL RFPWR,TPC
SWP
MKPEXPND_RFPWR 10.00.LEAD
MKPEXPND_RFPWR?
```

<Response>

10.00

MKPMAX_CDP

■ Function

Max Marker Position for Code Domain

Reads out the maximum value of marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKPMAX_CDP? *phase*	*position*

■ Parameter

phase

Signal type

Value	Signal Type	Measuring Object (*cf.* MEASOBJ)
None	Signal specified by the Operation Phase (at Up Link), or specified not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

position

Maximum value of marker position.

Resolution	Unit
1	None

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)
- *** is read out when Trace Format is set to other than Code Domain. (*cf.* TRFORM)
- This setting is not possible when “Marker Mode for Transmitter Power” is set to Off. (cf. MKR_RFPWR)

■ Use example

Reads out the Max Marker Position value of I signal when Measuring Object is at Up Link.

<Program>

MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
AUTODET ON
MKR_MOD NRM
SWP
MKPMAX_CDP? I

<Response>

32

MKPSLT_CDVSTM

■ Function

Marker Position for Code vs Time

Sets the marker position of slot when Trace Format is set to Code vs. Time at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
MKPSLT_CDVSTM *a*	MKPSLT_CDVSTM?	*a*

■ Value of a

Marker position in slot of Code vs Time waveform

Range	Resolution	Initial Value
1 to Setup Slot Length	1	1

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the marker position to slot 10.

<Program>

MEAS MODANAL

TRFORM CDVSTM

SWP

MKPSLT_CDVSTM 10

MKPSLT_CDVSTM?

<Response>

10

MKPSLT_DEMOD

■ Function

Slot Number for Demodulation

Sets the slot position displays Demodulation data at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
MKPSLT_DEMOD*a*	MKPSLT_DEMOD?	*a*

■ Value of a

Slot number

Range	Resolution	Initial Value
1 to (*Demodulation Frame* ∗ 15)	1	1

Demodulation Frame is set up by FRMDM.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the slot position to 15

<Program>

DSPL DEMOD

SWP

MKPSLT_DEMOD 15

MKPSLT_DEMOD?

<Response>

15

MKPTOTAL_RFPWR

■ Function

Total Waveform Marker Position for Transmitter Power (TPC)
Sets the marker position of Total Waveform Trace at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
MKPTOTAL_RFPWR *a,b*	MKPTOTAL_RFPWR? *b*	*a*

■ Value of a

Marker position

Range	Resolution	Initial Value
1 to Slot Length	1	0

Slot Length is set up by SLTLEN_RFPWR (cf. SLTLEN_RFPWR).

■ Value of b

Marker object

<table>
<tr><th>Range</th><th>Marker object</th><th>Window (cf. WINDOW_RFPWR)</th></tr>
<tr><td>None</td><td rowspan="2">Sets the marker position of Expand Waveform.</td><td rowspan="2">Except Leading & Trailing</td></tr>
<tr><td>LEAD</td></tr>
<tr><td>None</td><td rowspan="2">Sets the marker position of Expand Waveform for Leading</td><td rowspan="3">Leading & Trailing</td></tr>
<tr><td>LEAD</td></tr>
<tr><td>TRAIL</td><td>Sets the marker position of Expand Waveform for Trailing.</td></tr>
</table>

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker position to slot number 10.
<Program>
DSPL RFPWR,TPC
SWP
MKPTOTAL RFPWR,10,LEAD
MKPTOTAL RFPWR? LEAD

<Response>
10

MKPZOOM_CDVSTM

■ Function

Zoom Marker Position for Code vs Time
Sets the zoom marker position when Trace Format is set to Code vs Time at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
MKPZOOM_CDVSTM *a*	MKPZOOM_CDVSTM?	*a*

■ Value of a

Zoom marker position of Code vs. Time waveform

Range	Resolution	Initial Value
1 to (Setup *Slot Length* −14)	1	1

Setup Slot Length is setup by SLTLEN_MOD (*cf.* SLTLEN_MOD).

■ Restrictions

- This setting is not possible when Measuring Object is QPSK (*cf.* MEASOBJ)
- This setting is possible only when Trace Format is Code vs Time at Modulation Analysis (*cf.* TRFORM).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the zoom marker position to Slot 10.
<Program>
MEASOBJ UPLNK
MEAS MODANAL
TRFORM CODE
SWP
MKR_MOD NRM
MKPZOOM_CDVSTM 10
MKPZOOM_CDVSTM?

<Response>
10

MKPZOOM_RFPWR

■ Function

Zoom Marker Position for Transmitter Power (TPC)

Sets the zoom marker position when Measure Method is set to TPC at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
MKPZOOM_RFPWR *a*	MKPZOOM_RFPWR?	*a*

■ Value of a

Zoom marker position of Code vs. Time waveform

Range	Resolution	Initial Value
1 to (Setup *Slot Length* −14)	1	0

Setup Slot Length is set up by SLTLEN_PFPWR (*cf.* SLTLEN_RFPWR).

■ Restrictions

- This setting is enabled only when Measure Method is TPC (*cf.* DSPL).
- This command can be used only when the using measuring system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the zoom marker to Slot 10.

<Program>

DSPL RFPWR,TPC
TRVIEW_RFPWR TOTAL
SWP
MKPZOOM_RFPWR 10
MKPZOOM_RFPWR?

<Response>

10

MKR_ADJ

■ Function

Marker Mode for Adjacent Channel Power

Sets Marker to On or Off at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
MKR_ADJ *mode*	MKR_ADJ?	*mode*

■ Parameter

mode

Marker setting

Value	Marker Setting	Initial value
NRM	Normal: Display the marker, and changes the marker position into entry status.	
OFF	Off: Erases the marker display, and cancels the entry stats for the marker position.	*

■ Restrictions

- This setting is possible only when Measure Method is set to Spectrum (All). (*cf.* DSPL)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Marker to On after Adjacent Channel Power measurement.

<Program>

DSPL ADJ,SPECT1

SWP

MKR_ADJ NRM

MKR_ADJ?

<Response>

NRM

MKR_CCDF

■ Function

Marker Mode for CCDF

Sets the marker mode at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
MKR_CCDF *a*	MKR_CCDF?	*a*

■ Parameter

Value of a

Marker setting

Value	Marker setting	Initial value
NRM	Normal: Display the marker, and the marker position is changed into entry state.	
OFF	Off: Erases the marker display, and the entry state is canceled for the marker position	*

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Changes the marker mode to entry state.

<Program>

```
DSPL CCDF,CCDF
SWP
MKR_CCDF NRM
MKP_CCDF?
```

<Response>

NRM

MKR_CDVSTM

■ Function

Marker Type for Modulation Analysis

Sets the marker type when Trace Format is set to Code vs. Time and Trace View is set to Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
MKR_CDVSTM *mode*	MKR_CDVSTM?	*mode*

■ Parameter

mode

Marker setup

Value	Marker setting	Initial value
NRM	Normal: Displays the point marker and changes the marker position to entry state.	*
ZOOM	Off: Displays the zoom marker and changes the marker position to entry state.	

■ Restrictions

- This setting is possible only when Trace Format is Code vs. Time and Trace View is Code vs. Time (*cf.* TRFORM, TRVIEW_MOD)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker to the zoom marker.

<Program>

```
DSPL MODANAL
TRFORM CDVSTM
TRVIEW_MOD CDVSTM
SWP
MKR_CDVSTM ZOOM
MKR_CDVSTM?
```

<Response>

```
ZOOM
```

MKR_MOD

■ Function

Marker Mode for Modulation Analysis
Sets Marker to On or Off for each trace at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
MKR_MOD *mode*	MKR_MOD?	*mode*

■ Parameter

mode
Marker setting

Value	Marker setting	Initial value
NRM	Normal: Displays the marker, and changes the marker position into entry status.	
OFF	Off: Erases the marker display, and cancels the entry status for the marker position.	*

■ Restrictions

- This setting is not possible when Trace Format is set to Non. (*cf.* TRFORM).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays a marker in the EMV display on the Modulation Analysis screen.
<Program>
DSPL MODANAL
TRFORM EVM
SWP
MKR_MOD NRM
MKR_MOD?

<Response>
NRM

MKR_RFPWR

■ Function

Marker Mode for Transmitter Power
Sets Marker to On or Off at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
MKR_RFPWR *mode*	MKR_RFPWR?	*mode*

■ Parameter

mode
Marker setting

Value	Marker setting	Initial Value
NRM	Normal: Displays the marker, and changes the marker position to entry status.	
OFF	Off: Erases the marker, and cancels the entry status for the marker position.	*

■ Restrictions

- This setting is not possible when Measure method is set to TPC or RACH. (*cf.* DSPL)
- This setting is not possible when Waveform Display is set to Off (*cf.* WAVEFORM)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays a marker on the Transmitter Power screen.
<Program>
DSPL RFPWR FILTER
WAVEFORM ON
SWP
MKR_RFPWR NRM
MKR_RFPWR?

<Response>
NRM

MKR_SMASK

■ Function

Marker Mode for Spectrum Emission Mask
Sets marker On/Off on the Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
MKR_SMASK *a*	MKR_SMASK?	*a*

■ Value of a

Marker display

Value	Marker On/Off	Initial value
NRM	Normal (On): Displays the marker, and sets the marker position to entry status.	
OFF	Off: Erase the marker display, and cancels entry status for the marker position.	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set marker to On.
<Program>
DSPL SMASK
SWP
MKR_SMASK NRM
MKR_SMASK?

<Response>
NRM

MKR_TPC

■ Function

Marker Type for Transmitter Power

Sets the marker type when Measure Method is set to TPC and Trace View is set to Total Waveform at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
MKR_TPC *mode*	MKR_TPC?	*mode*

■ Value of a

mode

Marker setting

Value	Marker setting	Initial value
NRM	Normal: Displays point marker and changes the marker position to entry state.	*
ZOOM	Zoom: Displays zoom marker and changes the marker position to entry state.	

■ Restrictions

- This setting is possible only when Measure Method is TPC and Trace View is Total Waveform (*cf.* TRVIEW_RFPWR)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets marker to zoom marker.

<Program>

DSPL RFPWR,TPC

TRVIEW_RFPWR TOTAL

SWP

MKR_TPC ZOOM

MKR_TPC?

<Response>

ZOOM

MKRS_ADJ

■ Function

Marker Position for Adjacent Channel Power
Sets the marker position in frequency units at Adjacent Channel Power measurement.
This command functions the same as the MKN_ADJ command.

■ Syntax

Program Message	Query Message	Response Message
MKRS_ ADJ *freq*	MKRS_ADJ?	*freq*

■ Parameter

freq
Frequency

Range	Resolution	Initial value	Unit
−10600000 to 10600000	50000	0	Hz

□ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz
GHZ, GZ: GHz

■ Restrictions

- This setting is possible when Measure Method is set to Spectrum (All). (*cf.* DSPL)
- This setting is not possible when Marker is set to Off. (*cf.* MKR_ADJ)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Makes a mark at 3.05 MHz.
<Program>
DSPL ADJ,SPECT1
SWP
MKR_ADJ NRM
MKRS_ADJ 3.05MHZ
MKRS_ADJ?

<Response>
3050000

MKRS_SMASK

■ Function

Marker Position for Spectrum Emission Mask (in Frequency)
Specifies the marker position on the Spectrum Emission Mask in frequency.
This command functions the same as the MKN_SMASK command.

■ Syntax

Program Message	Query Message	Response Message
MKRS_SMASK *a*	MKRS _SMASK?	*a*

■ Value of a

Position in Frequency

Range	Resolution	Initial value	Unit
−12000000 to 12000000	10000	0	Hz

□ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz
GHZ, GZ: GHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the marker position at 2.51 MHZ.
<Program>
DSPL SMASK
SWP
MKRS_SMASK 2.51MHZ
MKRS_SMASK?

<Response>
2510000

MKSCNO

■ Function

Marker Level for Channelization Code Number

Reads out the Channelization Code Number at the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKSCNO? *code*	*code*

■ Parameter

phase

Signal type

Value	Signal Type	Measuring Object (cf. MEASOBJ)
None	Signal specified by the Operation Phase (at Up Link), or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

code

Channelization Code Number

Range (*cf.* SF_CDP)	Resolution	Unit
0 to (Spreading Factor −1)	1	None

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)

■ Use example

Reads out the Channelization Code Number on the 76th I signal when Measuring Object is at Up Link.

<Program>

MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
AUTODET ON
MKR_MOD NRM
MKP_CDP 76,I
SWP
MKSCNO? I

<Response>

17

MKSF

■ Function

Marker Level for Spreading Factor

Reads out the Spreading Factor at the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKSF?*phase*	*sf*

■ Parameter

phase

Signal type

Value	Signal Type	Measuring Object (*cf.* MEASOBJ)
None	Signal specified by the Operation Phase (at Up Link), or specification not possible (at Down Link)	Up Link, Down Link
I	I signal.	Up Link
Q	Q signal	Up Link

sf

Spreading Factor

Range	Measuring Object (*cf.* MEASOBJ)
4, 8, 16, 32, 64, 128, 256, 512	Down Link
4, 8, 16, 32, 64, 128, 256	Up Link

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)

■ Use example

Reads out the Spreading Factor on the 76th I signal when Measuring Object is at Up Link.

<Program>

MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
AUTODET ON
MKR_MOD NRM
MKP_CDP 76,I
SWP
MKSF? I

<Response>
16

MKSGNL

■ Function

Marker Level for Signal

Reads out whether the signal at the marker position is noise or not, when Trace Format is set to Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKSGNL? *phase*	*judge*

■ Parameter

phase

Signal type

Value	Signal Type	Measuring Object (*cf.* MEASOBJ)
None	Signal specified by the Operation Phase (at Up Link), or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

judge

Judgment whether signal or noise

Value	Signal/Noise
ON	Signal
OFF	Noise

■ Restrictions

- Readout is not possible when Measuring Object is set to QPSK (*cf.* MEASOBJ).
- This setting is possible only when Auto Rate Detection is set to ON (*cf.* AUTODET).
- *phase* setting is not possible when Measuring Object is set to Down Link (*cf.* MEASOBJ).

■ Use example

Reads out the judgment for the 76th I signal when Measuring Object is at Up Link.

<Program>

```
MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
AUTODET ON
MKR_MOD NRM
MKP_CDP 76,I
SWP
MKSGNL? I
```

<Response>
ON

MKWAV

■ Function

Marker Level for Waveform Quality (ρ)

Reads out Waveform Quality (ρ) at the marker position when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	MKWAV? *phase*	ρ

■ Parameter

phase

Signal type

Value	Signal Type	Measuring Object (*cf.* MEASOBJ)
None	Signal specified by the Operation Phase (at Up Link), or specification not possible (at Down Link)	Up Link, Down Link
I	I signal	Up Link
Q	Q signal	Up Link

ρ

Waveform Quality (ρ)

Resolution	Unit
0.00001	None

■ Restrictions

- Readout is not possible when the Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)

■ Use example

Reads out Waveform Quality (ρ) for the 76th I signal when Measuring Object is at Up Link.

<Program>

MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
SF_CDP 128,I
MKR_MOD NRM
MKP_CDP 76,I
SWP
MKWAV? I

<Response>

0.00355

MLTCARRCAL

■ Function

Multi Carrier Power Calibration

Executes multi carrier calibration.

■ Syntax

Program Message	Query Message	Response Message
MLTCARRCAL	---	---

■ Restrictions

- This command is possible only when the measurement screen is set to
  Modulation Analysis
  Demodulation Data
  Transmitter Power
  Occupied Bandwidth
  Adjacent Channel Power
  Spurious Emission
  Spectrum Emission Mask
  CCDF. (*cf.* DSPL)
- Terminal must be set to RF. (*cf.* TERM)

■ Use example

Executes Multi Carrier Calibration.

<Program>

DSPL MODANAL

MLTCARRCAL

MSTAT

■ Function

Returns the current measurement status.

■ Syntax

Program Message	Query Message	Response Message
---	MSTAT?	*status*

■ Parameter

status

Measurement status

Value	Measurement Status
0	Normal termination
1	RF-signal level limit
2	Level over
3	Level under
6	Trigger timeout
9	Not-measured

- "Level limit" refers to a signal which has gone beyond the RF level limit that can be input to the Tx Tester.
- "Level over" refers to a signal which can be measured by adjusting the Reference Level.

■ Use example

Reads out the measurement status after modulation analysis.

<Program>

DSPL MODANAL

SWP

MSTAT?

<Response>

0

OBW

■ Function

Occupied Bandwidth

Outputs the frequency range accounting for 99% of the total power of the channel frequency at the Occupied Bandwidth measurement.

This command functions the same as the OCCBW command.

■ Syntax

Program Message	Query Message	Response Message
---	OBW?	*freq*

■ Parameter

freq

99% occupied bandwidth

Value	Unit
1	Hz

■ Use example

Reads out the 99% occupied bandwidth.

<Program>

DSPL OBW,SPECT

SWP

OBW?

<Response>

11593750

OBWFREQ

■ Function

Occupied Bandwidth Limit and Center

Reads out the upper or lower bandwidth from the center of the waveform at Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
---	OBWFREQ? *area*	*bw*

■ Parameter

area

Band to be read out

Value	Band to Read Out
UPPER	Upper Limit: Displays the bandwidth accounting for 49.5% of the total power in the upper frequency area from the displayed waveform center frequency in MHz unit.
+	
LOWER	Lower Limit: Displays the bandwidth accounting for 49.5% of the total power in the lower frequency area from the displayed waveform center frequency in MHz unit.
−	
CENTER	(Upper +Lower)/ 2: Displays the half-value of the sum of the upper-limit frequency and lower-limit frequency.

bw

Bandwidth

Resolution	Unit
1	Hz

■ Use example

Reads out the Upper Limit of the occupied bandwidth.

<Program>

DSPL OBW, FFT

SWP

OBWFREQ? UPPER

<Response>

4907884

OCCBW

■ Function

Occupied Bandwidth

Outputs the frequency range accounting for 99% of the total power of the channel frequency at the Occupied Bandwidth measurement.

This command functions the same as the OBW command.

■ Syntax

Program Message	Query Message	Response Message
---	OCCBW?	*freq*

■ Parameter

freq

99% occupied bandwidth

Resolution	Unit
1	Hz

■ Use example

Reads out the 99% occupied bandwidth.

<Program>

DSPL OBW,SPECT

SWP

OCCBW?

<Response>

11593750

OFFPWR

■ Function

Off Power for Transmitter Power (RACH)
Reads out Off Power when Measure Method is set to RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	OFFPWR? *unit*	*avgpwr,leadpwr,trailpwr*

■ Parameter

unit
Specification of an output unit

Value	Readout Unit
DBM	dBm
WATT	W

avgpwr, leadpwr, trailpwr
Off Power (Average), Off Power(Leading Side), Off Power (Trailing Side)

Resolution	Unit (Depends on the value specified by *unit*.)
0.01	dBm
0.001	W

Off Power (Leading Side) is average value in front of On Power position, Off Power (Trailing Side) is average value after On Power position, Off power (Average) is both average value.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out measured result of Tx Power.
<Program>
DSPL RFPWR,RACH
SWP
OFFPWR? DBM

<Response>
−48.53, −41.23, −43.50

OPRTP

■ Function

Operation Phase
Sets the I/Q signal targeted for operation when Measuring Object is at Up Link and Trace Format is Code Domain at Modulation Analysis measurement.
When no signal type is specified, for example, during readout the measured results of the spreading factor or marker on the Modulation Analysis screen; the measured results of the signal set in this command is returned.

■ Syntax

Program Message	Query Message	Response Message
OPRTP *phase*	OPRTP?	*phase*

■ Parameter

phase
Signal targeted for operation

Value	Signal Targeted for Operation	Unit
I	I signal	*
Q	Q signal	

■ Restrictions

- This setting is not possible when the Measuring Object is set to other than Up Link. (*cf.* MEASOBJ)
- This setting is not possible when Trace Format is set to other than Code Domain. (*cf.* TRFORM)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the signal targeted for operation to I signal.
<Program>
DSPL SETCOM
MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
OPRTP I
OPRT?

<Response>
1

OPRTTR

■ Function

Operation Trace for Code vs Time

Sets trace of marker control object when Trace Format is set to Code vs. Time at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
OPRTTR *a*	OPRTTR?	*a*

■ Parameter

Value of a

Value	Setup marker control object	Initial Value
CODE	Code Domain Power: Sets marker control object to Code Domain Power.	
CDVSTM	Code vs Time: Sets marker control object to Code vs. Time	*

■ Restrictions

- This setting is possible only when Trace Format is Code vs. Time and Trace View is Code Domain & Code vs. Time. (*cf.* TRFORM).
- It is depended on Trace View setup except the above mentioned case (*cf.* TRVIEW).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets marker control object to Code vs. Time.

<Program>

DSPL MODANAL

TRFORM CDVSTM

OPRTTR CDVSTM

OPRTTR?

<Response>

CDVSTM

OPRTTR_DEMOD

■ Function

Operation Trace for Demodulation

Sets trace of marker control object at Demodulation screen.

■ Syntax

Program Message	Query Message	Response Message
OPRTTR_DEMOD*a*	OPRTTR_DEMOD?	*a*

■ Parameter

Value of a

Value	Setup marker control object	Initial Value
DEMOD	Demodulation: Sets marker control object to Demodulation data.	*
CDVSTM	Code vs Time: Sets marker control object to Code vs. Time	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets marker control object to Code vs. Time.

<Program>

DSPL DEMOD

OPRTTR_DEMOD CDVSTM

OPRTTR_DEMOD?

<Response>

CDVSTM

OPRTTR_RFPWR

■ Function

Operation Trace for Transmitter Power (TPC, RACH)

Sets marker control object when Measure Method is set to TPC or RACH at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
OPRTTR_RFPWR *a*	OPRTTR_RFPWR?	*a*

■ Parameter

Value of a

Value	Marker control object	Initial Value	Window (*cf.* WINDOW_RFPWR)
TOTAL	Total: Sets control object to Total Waveform.	*	Slot, Leading, Trailing
	Total-Lead: Sets control object to Leading marker of Total Waveform.		Leading & Trailing
EXPND	Expand: Sets control object to Expand Waveform.		Slot, Leading, Trailing
	Expand-Lead: Sets control object to Leading marker of Expand Waveform.		Leading & Trailing
TOTAL TRAIL	Total-Trail: Sets control object to Trailing marker of Total Waveform		Leading & Trailing
EXPAND TRAIL	Expand-Trail: Sets control object to Trailing of Expand Waveform		Leading & Trailing

■ Restrictions

- This setting is possible only when Measure Method is TPC or RACH (*cf.* DSPL).
- This setting is possible only when Trace View is Total & Expand (*cf.* TRVIEW_RFPWR).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets marker control object to Expand Waveform

<Program>

DSPL RFPWR,TPC

TRVIEW_RFPWR TOTALEXPND

OPRTTR_RFPWR EXPND

OPRTTR_RFPWR?

<Response>

EXPND

ORGNOFS

■ Function

Origin Offset

Outputs the Origin Offset (carrier leakage component) measured results for the signal measured at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	ORGNOFS?	*level*

■ Parameter

level

Origin offset value

Resolution	Unit
0.01	dB

■ Use example

Reads out the origin offset value.

<Program>

DSPL MODANAL

SWP

ORGNOFS?

<Response>

−34.33

OXMC

■ Function

Ware Data for origin I-Q Signal

Reads out and processes origin I-Q Signal at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
OXMC *a,b*	OXMC? *a*	*c*

■ Parameter

Value of a

Selection of I or Q

Value	Selection of I or Q
0	I signal
1	Q signal

Value of b

16 bit waveform data to be written

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.0001 units, where the ideal signal "1" becomes 10,000.

Value of c

Read-out data of 32 bit waveform

Range	Resolution
−2147483648 to 2147483647	1

- Data are set using integers in 0.0001 units, where the ideal signal "1" becomes 10,000.

■ Use example

Reads out origin I-signal and Q-signal

<Program>

DSPL MODANAL

SWP

OXMC? 0

OXMC? 1

<Response>

0

0

PAGE_DEMOD

■ Function

Page for Demodulation Data

Sets display page on Demodulation Data screen

■ Function

Program Message	Query Message	Response Message
PAGE_DEMOD *a*	PAGE_DEMOD?	*a*

■ Parameter

value of a

Page number

Range	Initial Value
1 to (Refer to Restriction)	1

■ Restrictions

- The setting range is changed by Measuring Object and Spreading Factor.

Measuring Object	Spreading Factor							
	4	8	16	32	64	128	256	512
Up Link	4	2	1	1	1	1	1	
Down Link	8	4	2	1	1	1	1	1
QPSK	Not enabled							

- This command can be used only when the using measurement system is MX860x01A/MX268x01A.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Display third page.

<Program>

DSPL DEMOD

SF_DEMOD 4

PAGE_DEMOD 3

PAGE_DEMOD?

<Response>

3

PEAK_SMASK

■ Function

Peak Data for Spectrum Emission Mask

Outputs peak value and the results of pass/fail judgment at specified template on Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
---	PEAK_SMASK? *a,b*	*c,d*

■ Value of a

Selection of readout data

Value	Display Format
ALL	Reads out the value at the point of minimum margin for the template of each frequency band.
PEAK	Reads out the value at the point of minimum margin among the template of all frequency bands.
L1, L2, L3, L4L L5 U1, U2, U3, U4, U5	Reads out the value at the point of minimum margin for the specified template among the template of frequency bands. (When Measuring object is set to Up Link, L5 and U5 are invalid)

The value of setting (Level or Margin) at the point of minimum margin is set by DISPTYPE_SMASK.

■ Value of b

Unit setting of read-out data

Value	Unit of Leakage Power	Initial Value
None	Set value for unit (*cf.* UNIT_SMASK)	
DB	dB	*
DBM	dBm	
MW	mW	
UW	μ W	
NW	nW	

When display type is set to MARGIN by DISPTYPE_SMASK, value of *b* is fixed to dB.

■ Value of c

Frequency

Resolution	Unit
0.01	dBm
0.01	dB
Significant digits: 4 digits (floating point format)	W

When value of *b* is set to MW or UW or NW, unit of read-out data is W.

■ Value of d

Judgment result

Value	Judgment Results
PASS	Pass: Passed
FAIL	Fail: Failed

■ Restrictions

- Value of b is fixed to dB when Display Type is set to Margin. (*cf.* DISPTYPE_SMASK)

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Reads out the peak value at the point of minimum margin.

<Program>
DSPL SMASK
PEAK_SMASK? PEAK, DB

<Response>
−12.64, FAIL

PHASEERR

■ Function

RMS Phase Error

Outputs the measured results for the RMS value of Phase Error at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	PHASEERR?	*phase*

■ Parameter

phase

RMS value of Phase Error

Resolution	Unit
0.01	deg

■ Use example

Reads out the measured results of phase error.

<Program>

DSPL MODANAL

SWP

PHASEERR?

<Response>

11.58

PHOLD_MOD

■ Function

Peak Hold for Modulation Analysis

Specifies whether to display the peak value of Peak Code Domain Error as average value in Average Mode.

■ Syntax

Program Message	Query Message	Response Message
PHOLD_MOD *on_off*	PHOLD_MOD?	*on_off*

■ Parameter

on_off

Displaying or not Display average value in Average Mode

Value	Display/Non-display	Initial Value
ON	Displays peak value of Peak Code Domain Error as average in Average Mode	*
OFF	Does not display peak value of Peak Code Domain Error as average value in Average Mode.	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.
- This setting is possible only when Storage Mode is set to Average (*cf.* STRG_MOD)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays peak value of Peak Code Domain Error at average value.

<Program>

PHOLD_MOD ON

PHOLD_MOD?

<Response>

ON

PICHCNO_MOD

■Function

PICH Channelization Code Number for Modulation Analysis

Sets PICH Channelization Code Number during Modulation Analysis measurement.

■Syntax

Program Message	Query Message	Response Message
PICHCNO_MOD *a*	PICHCNO_MOD?	*a*

■Parameter

a

PICH Channelization Code Number setting

Range	Resolution	Initial value
0 to 255	1	16

■Restrictions

・ This command is available when Measuring Object is set to Down Link or Down Link(Compressed) (*cf.* MEASOBJ).

・ Valid only when DTX Setup is set to On(*cf.* DTXSETUP_MOD).

・ Available only for MX860x01B/MX268x01B.

■Initialization command

PRE, INI, IP, ＊RST

■Use example

Sets PICH Channelization Code Number to10.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

DTXSETUP_MOD ON

PICHCNO_MOD 10

PICHCNO_MOD?

<Response>

10

PICHTIMINGOFS_MOD

■Function

PICH Timing Offset for Modulation Analysis

Sets PICH Timing Offset during Modulation Analysis measurement.

■Syntax

Program Message	Query Message	Response Message
PICHTIMINGOFS_MOD *a*	PICHTIMINGOFS_MOD?	*a*

■Parameter

a

PICH Timing Offset setting

Range	Resolution	Initial value
0 to 149	1	120

■Restrictions

- This command is available when Measuring Object is set to Down Link or Down Link(Compressed) (*cf.* MEASOBJ).
- Valid only when DTX Setup is set to On.(*cf.* DTXSETUP_MOD).
- Available only for MX860x01B/MX268x01B.

■Initialization command

PRE, INI, IP, ＊RST

■Use example

Sets PICH Timing Offset to 10.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

DTXSETUP_MOD ON

PICHTIMINGOFS_MOD 10

PICHTIMINGOFS_MOD?

<Response>

10

PNLMD

■ Function

Panel Mode

Switches the measurement mode for MS860x/MS268x.

■ Syntax

Program Message	Query Message	Response Message
PNLMD *mode*	PNLMD?	*mode*

■ Parameter

mode

Measurement mode

Value	Measurement Mode
SPECT	Spectrum Analyzer mode
SYSTEM	Tx Tester mode
CONFIG	Config mode

■ Use example

Switches to the Tx Tester mode.

<Program>

PNLMD SYSTEM

PNLMD?

<Response>

SYSTEM

POWER

■ Function

Power

Outputs the absolute (in dBm/W unit) or relative value (in dB unit) of the average RF power measured by the power meter.

■ Syntax

Program Message	Query Message	Response Message
---	POWER? *unit*	*pwr*

■ Parameter

unit

Readout unit

Value	Readout unit
DBM	dBm
WATT	W
DB	dB

pwr

Absolute or relative value of average RF power

Resolution	Unit (Depends on the value specified by *unit*.)
0.01	dBm, dB
0.001	W

■ Use example

Reads out the average RF power in dBm units.

<Program>

DSPL PWRMTR

POWER? DBM

<Response>

－1.43

■ Restrictions according to model type and options

For MS268x, This command is not available.

POWER_CCDF

■ Function

Power for CCDF

Outputs Power at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
---	POWER_CCDF?	*a,b,c,d,e*

■ Parameter

Value of a, b, c, d ,e

Value of a	Average Power
Value of b	Maximum Power (Absolute value)
Value of c	Maximum Power (Relative value to Averaged Power)
Value of d	Minimum Power (Absolute value)
Value of e	Minimum Power (Relative value to Averaged Power)

■ Restrictions

- This command can be used only when the using measurement system MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Reads out the measurement result of average power.

<Program>

DSPL CCDF,CCDF

SWP

POWER_CCDF?

<Response>

10.53, 20.53, 10.00, 0.53, −10.00

PPCDPERR

■ Function

Peak Code Domain Error

Outputs the Channelization Code Number and Spreading Factor of Peak Code Domain Error and measured result at Modulation Analysis Measurement.

■ Syntax

Program Message	Query Message	Response Message
---	PPCDPERR?	*err*
---	PPCDPERR? ERR	
---	PPCDPERR? SF	*sf*
---	PPCDPERR? CH	*ch*
---	PPCDPERR? PHASE	*phase*

■ Parameter

err

Peak Code Domain Error

Resolution	Unit
0.01	dB

sf

Spreading Factor

Value	Measuring Object (*cf.* MEASOBJ)
256	Down Link

ch

Channelization Code Number

Range	Resolution
0 to (sf−1)	1

phase

Phase

Range	Measuring Object (*cf.* MEASOBJ)
I,Q	Up Link

■ Restrictions

- Readout is not possible when Measuring Object is set to UP Link (RACH), QPSK. (*cf.* MEASOBJ)
- Argument Phase is valid only when Measuring Object is set to UP Link. (*cf.* MEASOBJ)

■ Use example

Reads out the Peak Code Domain Error.

<Program>

```
DSPL MODANAL
TRFORM CODE
SWP
PPCDPERR?
```

<Response>

−12.87

PRE

■ Function

Preset

Initializes all the measurement control parameters to be initialized.

This command functions the same as the INI and IP commands.

■ Syntax

Program Message	Query Message	Response Message
PRE	---	---

■ Use example

Initializes parameters to be initialized.

<Program>

PRE

PREAMP

■ Function

Pre Ampl

Sets Pre Ampl to On or Off.

■ Syntax

Program Message	Query Message	Response Message
PREAMP *on_off*	PREAMP?	*on_off*

■ Parameter

on_off

On or Off setting of Pre Ampl

Value	Pre Ampl	Initial Value
ON	Sets Pre Ampl to On.	
OFF	Sets Pre Ampl to Off.	*

■ Initialization command

*RST

■ Use example

Sets Pre Ampl to On.

<Program>

PREAMP ON

PREAMP?

<Response>

ON

■ Restrictions according to model type and options

This command is available when main unit option MS8608A-08/MS8609A-08/MS2683A-08 is installed.

PROBPWR_CCDF

■ Function

Power at Specified Probability for CCDF

Outputs Power deviation for the specified probability on CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
---	PROBPWR_CCDF?	*a1,a2,a3,a4,a5,a6*

■ Parameter

Value of a

Resolution	Unit
0.01	dB

Results of 10, 1, 0.1, 0.01, 0.001, 0.0001% is read out.

*** is read out when is not corresponding power.

■Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Reads out measurement result of power deviation.

<Program>

DSPL CCDF,CCDF

SWP

PROBPWR_CCDF?

<Response>

2.3, 4.5, 5.6, 6.8, ***,***

PSSYNC_DEMOD

■ Function

Pilot Symbol Synchronization for Demodulation

Determine the absolute phase by pilot symbol synchronization at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
PSSYNC_DEMOD *on_off*	PSSYNC_DEMOD?	*on_off*

■ Parameter

on_off

Setting synchronization processing to On or Off

Value	Stting Synchronization Processing to On or Off	Initial Value
ON	Performs synchronization processing by the pilot symbol.	
OFF	Does not perform synchonization processing by the pilot symbol.	*

■ Initialization command

*RST

■ Use example

Performs synchronization processing by the pilot symbol.

<Program>

DSPL DEMOD

PSSYNC_DEMOD ON

PSSYNC_DEMOD?

<Response>

ON

PVECTERR

■ Function

Peak EVM

Outputs the measured result for the EVM maximum instantaneous value at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	PVECTERR?	*pevm*

■ Parameter

pevm

Peak EVM

Resolution	Unit
0.01	%

■ Use example

Reads out the peak EVM value.

<Program>

DSPL MODANAL

SWP

PVECTERR?

<Response>

45.23

PWRCAL

■ Function

Power Calibration

"PWRCAL" enable calibration at power measurement, and "PWRCAL?" enable read out the calibration value.

"CALVAL" enables setting of the calibration value only through an external control.

■ Syntax

Program Message	Query Message	Response Message
PWRCAL	PWRCAL?	*cal*

■ Parameter

cal

Calibration value

Range	Resolution	Initial value	Unit
−10.00 to 10.00	0.01	0.00	dBm

■ Restrictions

- This function cannot be executed when the displayed measurement screen is the Setup Common Parameter, Power Meter or IQ Level screen. (*cf.* DSPL)

■ Use example

Performs calibration in power measurement.

<Program>

CALVAL 2.33

PWRCAL?

PWRCAL

<Response>

2.33

■ Restrictions according to model type and options

For MS268x, This command is not available.

PWRPROB_CCDF

■ Function

Probability at Specified Power for CCDF
Outputs probability for grid on the CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
---	PWRPROB_CCDF?	*a1,a2,a3,a4,a5*

■ Parameter

Value of a
Probability in specified power

Resolution	Unit
0.0001	%

Results are read out in order of small grid value. *** is read out when there is not corresponding power.

Horizontal Scale (*cf.* HSCALE_CCDF)	Grid value to be read				
2 dB	0.4 dB	0.8 dB	1.2 dB	1.6 dB	2 dB
5 dB	1 dB	2 dB	3 dB	4 dB	5 dB
10 dB	2 dB	4 dB	6 dB	8 dB	10 dB
20 dB	4 dB	8 dB	12 dB	16 dB	20 dB
50 dB	10 dB	20 dB	30 dB	40 dB	50 dB

Grid data of Negative side is read out only when Trace Format is Negative.

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out the measurement result of probability on grid.
<Program>
DSPL CCDF,CCDF
SWP
PWRPROB_CCDF?

<Response>
50.1234, 12.2345, 7.1234, 3.2345, ***

QLVL

■ Function

Q Level (RMS)

Reads out the measured results of RMS value for Q signal on the IQ Level screen.

■ Syntax

Program Message	Query Message	Response Message
---	QLVL? *unit*	*rms*

■ Parameter

unit

Readout unit

Value	Readout unit
None	Current set unit
MV	MV
DBMV	dBmV

rms

RMS value for Q signal

Resolution	Unit
0.01	Depends on the value specified by *unit*.

■ Use example

Reads out the Q Level (RMS) value.

<Program>

TERM IQAC

MEAS IQLVL

QLVL? MV

<Response>

0.53

■ Restrictions according to model type and options

For MS268x, if Option-17 or -18 is not installed, this command is invalid

QPPLVL

■ Function

Q Level (Peak to Peak)

Reads out the measured results of Peak-to-Peak value for Q signal on the IQ Level screen.

■ Syntax

Program Message	Query Message	Response Message
---	QPPLVL? *unit*	*pp*

■ Parameter

unit

Readout unit

Value	Readout unit
None	Current set unit
MV	MV
DBMV	dBmV

pp

Peak-to-Peak value for Q signal

Resolution	Unit
0.01	Depends on the value specified by *unit*.

■ Use example

Reads out the Q Level (Peak-to-Peak) value

<Program>

TERM IQAC

MEAS IQLVL

QPPLVL? MV

<Response>

3.55

■ Restrictions according to model type and options

For MS268x, if Option-17 or -18 is not installed, this command is invalid.

RATIO

■ Function

On/Off Power Ratio for Transmitter Power (RACH)

Reads out On/Off Power Ratio when Measure Method is RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	RATIO?	*ratio*

■ Parameter

ratio

On/Off ratio

Resolution	Unit
0.01	dB

On/Off ratio is Off Power (Average)/On Power ratio.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out measurement result of On/Off ratio.

<Program>

DSPL RFPWR,RACH

SWP

RATIO?

<Response>

−48.53

RBD_ADJ

■ Function

RBW Mode: Digital/Normal

Makes setting to or not to digital filter sweeping mode at the Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
RBD_ADJ *a*	RBD_ADJ?	*a*

■ Value of a

Sweeping Mode

Value	Sweeping Mode	Initial value
DGTL	Set to digital filter sweeping mode (Digital)	
NRM	Set to normal sweeping mode (Normal)	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set to digital filter sweeping mode.

<Program>

RBD_ADJ DGTL

RBD_ADJ?

<Response>

DGTL

■ Note

This function is an option. If the option is invalid, it is deemed that Normal has been set.

RBD_OBW

■ Function

RBW Mode: Digital/Normal

Make setting to or not to digital filter sweeping mode at the Occupied Bandwidth measurement using Spectrum Analyzer.

■ Syntax

Program Message	Query Message	Response Message
RBD_OBW *a*	RBD_OBW?	*a*

■ Value of a

Sweeping mode

Value	Sweeping Mode	Initial value
DGTL	Set to digital filter sweeping mode (Digital)	
NRM	Set to normal sweeping mode (Normal)	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set to digital filter sweeping mode.

<Program>

RBD_OBW DGTL

RBD_OBW?

<Response>

DGTL

■ Note

This function is an option. If the option is invalid, it is deemed that Normal has been set.

RBD_SMASK

■ Function

RBW Mode: Digital/Normal for Spectrum Emission Mask

Make setting to or not to digital filter sweeping mode at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
RBD_SMASK *a*	RBD_SMASK?	*a*

■ Value of a

Sweeping Mode

Value	Sweeping Mode	Initial value
DGTL	Set to digital filter sweeping mode (Digital)	
NRM	Set to normal sweeping mode (Normal)	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set to digital filter sweeping mode

<Program>

RBD_SMASK DGTL

RBD_SMASK?

<Response>

DGTL

■ Note

This function is an option. If the option is invalid, it is deemed that Normal has been set.

RBW_ADJ

■ Function

Resolution Bandwidth for Adjacent Channel Power

Sets the Resolution Bandwidth (RBW) in the Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
RBW_ADJ *a*	RBW_ADJ?	*a*

■ Value of a

RBW

Range	Resolution	Initial value	Unit	Remarks
10 to 1000000	1	30000	Hz	For RBW Mode : Digital
300 to 20000000	1	30000	Hz	For RBW Mode : Analog

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GZ: GHz

■ Restrictions

- Any value may be input into the setting range. However, the value that is set is the value, as shown in the Table below.

Setting value	Remarks
10, 30, 100, 300, 1000, 3000, 10000, 100000, 300000, 1000000	For RBW Mode: Digital
300, 1000, 3000, 10000, 30000, 100000, 300000, 1000000, 3000000, 5000000, 10000000, 20000000	For RBW Mode: Analog

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets RBW to 30 kHz.

<Program>

RBW_ADJ 30KHZ

RBW_ADJ?

<Response>

30000

RBW_CCDF

■ Function

Select Resolution Bandwidth for CCDF
Selects the digital filter to filter at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
RBW_CCDF *a*	RBW_CCDF?	*a*

■ Value of a

Selection of filter

Value	Selection of filter	Initial Value
3 MHz, 5 MHz, 10 MHz, 20 MHz,	RBW of the value of a is used.	5 MHz
RRC	RRC filter (α = 0.22) of 3.84 MHZ is used	
RC	RC filter (α = 0.22) of 3.84 MHZ is used	

□ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz

■ Restrictions

- This command can by used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets RBW to 10 MHz.
<Program>
DSPL CCDF,CCDF
RBW_CCDF? 10MHZ
RBW_CCDF?

<Response>
10MHZ

RBW_OBW

■ Function

Resolution Bandwidth for Occupied Bandwidth

Sets Resolution Bandwidth (RBW) in Occupied Bandwidth measurement using a Spectrum Analyzer.

■ Syntax

Program Message	Query Message	Response Message
RBW_OBW *a*	RBW_OBW?	*a*

■ Value of a

RBW

Range	Resolution	Initial value	Unit	Remarks
10 to 1000000	1	30000	Hz	For RBW Mode: Digital
300 to 20000000	1	30000	Hz	For RBW Mode: Analog

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GZ: GHz

■ Restrictions

- Although any value within the setting range can be input, the actual value is set according to the following list.

Setting value	Remarks
10, 30, 100, 300, 1000, 3000, 10000, 100000, 300000, 1000000	For RBW mode: Digital
300, 1000, 3000, 10000, 30000, 100000, 300000, 1000000, 3000000, 5000000, 10000000, 20000000	For RBW mode: Analog

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets RBW to 30 kHz.

<Program>

RBW_OBW 30KHZ

RBW_OBW?

<Response>

30000

REFTR_CCDF

■ Function

Select Reference Trace for CCDF

Select waveform of addition indication at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
REFTR_CCDF *a*	REFTR_CCDF?	*a*

■ Value of a

Selection of Waveform

Value	Selection of filter	Initial value
OFF	Displays only the measured waveform	*
SAVE	Displays waveform set by Save Reference Trace (*cf.* SAVETR_CCDF)	
GAUSS	Displays waveform of Gaussian Trace	
SAVEGAUSS	Displays waveform of Save Trace and waveform Gaussian Trace.	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays waveform of Save Trace.

<Program>

DSPL CCDF,CCDF

REFTR_CCDF SAVE

REFTR_CCDF?

<Response>

SAVE

RL_ADJ

■ Function

Ref Level for Adjacent Channel Power

Sets the Ref Level for Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
RL_ADJ *a*	RL_ADJ?	*a*

■ Value of a

Ref Level

Range	Resolution	Initial value	Unit
Refer to Restriction	0.01	50.00	dBm

□ Suffix code

None: dBm

DBM: dBm

■ Restrictions

- Reference level setting range depends on RF Input: High/Low (*cf.* RFINPUT), Per Ampl: On/Off (*cf.* PREAMP), as follows. Refer to RFLVOFS for RefLevelOffset.

		RF Input	
		High	Low
Attenuator Mode: Auto	Pre Ampl: Off	(−100.00 + RefLevelOffset) to (50.00 + RefLevelOffset)	(−120.00 + RefLevelOffset) to (40.00 + RefLevelOffset)
	Pre Ampl: On	(−120.00 + RefLevelOffset) to (30.00 + RefLevelOffset)	(−140.00 + RefLevelOffset) to (20.00 + RefLevelOffset)

- If the reference level will become out of range due to RF Input or Pre Ampl change, the level is rounded to the nearest value within the range.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Reference Level to −30 dBm.

<Program>

ATTMD_ADJ AUTO

RL_ADJ −30DBM

RL_ADJ?

<Response>

−30.00

RL_OBW

■ Function

Ref Level for Occupied Bandwidth

Sets Ref Level in Occupied Bandwidth measurement using spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
RL_OBW *a*	RL_OBW?	*a*

■ Parameter

Ref Level

Range	Resolution	Initial value	Unit
Refer to Restriction.	0.01	50.00	dBm

□ Suffix code

None: dBm

DBM: dBm

■ Restrictions

- Reference level setting range depends on RF Input: High/Low (*cf.* RFINPUT), Pre Ampl: On/Off, as follows. Refer to RFLVLOFS for RefLevelOffset.

<table>
<tr><th colspan="2"></th><th colspan="2">RF Input</th></tr>
<tr><td colspan="2"></td><td>High</td><td>Low</td></tr>
<tr><td rowspan="2">Attenuator Mode: Auto</td><td>Pre Ampl: Off</td><td>(−100.00 + RefLevelOffset) to (50.00 + RefLevelOffset)</td><td>(−120.00 + RefLevelOffset) to (40.00 + RefLevelOffset)</td></tr>
<tr><td>Pre Ampl: On</td><td>(−120.00 + RefLevelOffset) to (30.00 + RefLevelOffset)</td><td>(−140.00 + RefLevelOffset) to (20.00 + RefLevelOffset)</td></tr>
</table>

- If the reference level will become out of range due to RF Input or Pre Ampl change, the level is rounded to the nearest value within the range.

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets Ref Level to −30 dBm.

<Program>

ATTMD_OBW AUTO

RL_OBW −30DBM

RL_OBW?

<Response>

−30.00

RL_SMASK

■ Function

Ref Level for Spectrum Emission Mask

Sets Ref-level in Spectrum Emission Mask measurement using spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
RL_SMASK *a*	RL_SMASK?	*a*

■ Value of a

Ref Level

Range	Resolution	Initial value	Unit
Refer to Restriction	0.01	50.00	dBm

□ Suffix code

None: dBm

DBM: dBm

■ Restrictions

- Refer to the following table for the setup range of Ref-level is as follows by RF Input: High/Low, Pre Ampl: On/Off. (*cf.* RFINPUT, PREAMP and refer to RFLVOFS about RefLevelOffset.)

		RF Input	
		High	Low
Attenuator Mode: Auto	Pre Ampl: Off	(−100.00 + RefLevelOffset) to (50.00 + RefLevelOffset)	(−120.00 + RefLevelOffset) to (40.00 + RefLevelOffset)
	Pre Ampl: On	(−120.00 + RefLevelOffset) to (30.00 + RefLevelOffset)	(−140.00 + RefLevelOffset) to (20.00 + RefLevelOffset)

- If the reference level will become out of range due to RF Input or Pre Ampl change, the level is rounded to the nearest value within the range.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Reference Level to −30 dBm.

<Program>

RL_SMASK −30DBM

RL_SMASK?

<Response>

−30.00

RFINPUT

■ Function

RF Input connector
Sets the connector for the input RF signal.

■ Syntax

Program Message	Query Message	Response Message
RFINPUT *high_low*	RFINPUT?	*high_low*

■ Parameter

high_low
RF signal connector

Value	RF Signal Connector	Initial Value
HIGH	High Power	*
LOW	Low Power	

■ Initialization value

*RST

■ Use example

Sets the RF input connector to High Power.
<Program>
RFINPUT HIGH
REFINPT?

<Response>

■ Restrictions according to model type and options

This command is available only for main unit is MS8608A.

RFLVL

■ Function

Reference Level

Sets the Reference Level.

■ Syntax

Program Message	Query Message	Response Message
RFLVL *rflevel*	RFLVL?	*rflevel*

■ Parameter

rflevel

Reference Level

Range	RF Input	Initial Value	Resolution	Unit
−(10.00 + *offset*) to (42.00 + *offset*)	MS8608A High Power	30.00	0.01	dBm
−(30.00 + offset) to (22.00 + *offset*)	MS8608A Low Power MS8609A	22.00	0.01	dBm

- *offset* represents the value set for the reference level offset. (*cf.* RFLVLOF)

□ Suffix code

None: dBm

DBM: dBm

■ Restrictions

- This setting is not possible when Terminal is set to other than RF. (*cf.* TERN)

■ Initialization command

∗RST

■ Use example

Sets the reference level to −10 dBm.

<Program>

```
TERM RF
RFINPUT HIGH
RFLVLOFS 0
RFLVL −10
RFLVL?
```

<Response>

HIGH

RFLVLOFS

■ Function

Reference Level Offset
Set the Reference Level Offset.

■ Syntax

Program Message	Query Message	Response Message
RFLVLOFS*offset*	RFLVLOFS?	*offset*

■ Parameter

offset
Reference Level Offset

Range	Resolution	Initial Value	Unit
−99.99 to 99.99	0.01	0.00	dB

□ Suffix code

None: dB
DB: dB

■ Restrictions

- This setting is not possible when Terminal is set to other than RF. (*cf.* TEAM)

■ Initialization command

*RST

■ Use example

Sets the reference level offset to 0 dB.
<Program>
TERM RF
RFLVLOFS 0.00
RFLVLOFS?

<Response>
0.00

RLALLTPC

■ Function

Relative Limit

Sets the Relative Limit value of Slots 2 thru (Analysis Slot −1) at TPC measurement.

■ Syntax

Program Message	Query Message	Response Message
RLALLTPC *rellimit1,cmnd,step*	RLALLTPC? *cmnd,step*	*rellimit2*

■ Parameter

rellimit1

Relative Limit

Range	Resolution	Initial Value
0.00 to 99.99	0.01	dB

□ Suffix code

None: dB

DB: dB

cmnd

Command

Value	Command
0	0
1	+1
2	−1

step

Power Control Step

Resolution	Unit
1	1 dB
2	2 dB
3	3 dB

rellimit2

Relative Limit

Range	Resolution	Initial Value
−99.99 to 99.99	0.01	dB

■ Restrictions

- *cmnd, step* can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initial value

Refer to the following table for initial value to *cmnd, step*.

Step	Command	Lower	Upper
1 dB	+1	0.5 dB	1.5dB
	0	−0.5 dB	0.5 dB
	−1	−1.5 dB	−0.5 dB
2 dB	+1	1.5 dB	2.5 dB
	0	−0.5 dB	0.5 dB
	−1	−2.5 dB	−1.5 dB
3 dB	+1	2.5 dB	3.5 dB
	0	−0.5 dB	0.5 dB
	−1	−3.5 dB	−2.5 dB

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the relative limit to 30.00dB.

<Program>

DSPL RFPWR,TPC

DSPL SETTPC

RLALLTPC 30.00

RLALLTPC?

<Response>

30.00

RLTPCTOL

■ Function

Power Control Tolerance for Transmitter Power (TPC)
Sets the Power Control Tolerance value of Slots 2 thru (Analysis Slot −1) at TPC measurement.

■ Syntax

Program Message	Query Message	Response Message
RLTPCTOL *low,up,cmnd,step*	RLTPCTOL? *cmnd,step*	*low,up*

■ Parameter

up, low
Power Control Tolerance

Range	Resolution	Initial Value
−99.99 to 99.99	0.01	dB

Up is Upper Limit, low is Lower Limit.

□ Suffix code

None: dB
DB: dB

cmd
Command

Value	Command
0	0
1	+1
2	−1

step
Power Control Step

Resolution	Unit
1	1 dB
2	2 dB
3	3 dB

Refer to the initial value of RLALLTPC for initial value to *cmnd, step*.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Lower, Upper Limit of Channel of Power Control 1 dB to −0.4 dB, 0.4dB.

<Program>

DSPL RFPWR,TPC

DSPL SETTPC

RLTPCTOL −0.4,0.4,1

RLTPCTOL? 0,1

<Response>

−0.4, 0.4

RNG

■ Function

Increases or decreases the measurement range for the power meter.

■ Syntax

Program Message	Query Message	Response Message
RNG *up_down*	---	---

■ Parameter

up_down

Operation of power meter range

Value	Operation of Power Meter Range
UP	Increases the measurement range by one step.
DN	Decreases the measurement range by one step.

- Transmitting the RNG UP command while the range is set to maximum does not change the range.
- Transmitting the RNG DN command while the range is set to minimum does not change the range.

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Increases the range by one step.

<Program>

RNG UP

■ Restrictions according to model type and options

For MS268x, This command is not available.

RNG1

■ Function

Sets the measurement range for the power meter to the minimum level.

The range value is set to 0 dBm or −20 dBm when the input RF level is set to MS8608A High power or MS8608A Low power/MS8609A, respectively.

■ Syntax

Program Message	Query Message	Response Message
RNG1	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the measurement range for the power meter to the minimum level.

<Program>

RNG1

■ Restrictions according to model type and options

For MX268x, This command is not available.

RNG2

■ Function

Sets the measurement range for the power meter to the second lowest level.

The range value is set to 10 dBm or −10 dBm when the input RF level is set to MS8608A High power or MS8608A Low power/MS8609A, respectively.

■ Syntax

Program Message	Query Message	Response Message
RNG2	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the measurement range for the power meter to the second lowest level.

<Program>

RNG2

■ Restrictions according to model type and options

For MS268x, This command is not available.

RNG3

■ Function

Sets the measurement range for the power meter to the intermediate level.
The range value is set to +20 dBm or 0 dBm when the input RF level is set to MS8608A High power or MS8608A Low power/MS8609A, respectively.

■ Syntax

Program Message	Query Message	Response Message
RNG3	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the measurement range of the power meter to the intermediate level.
<Program>
RNG3

■ Restrictions according to model type and options

For MS268x, This command is not available.

RNG4

■ Function

Sets the measurement range for the power meter to the fourth lowest level.
The range value is set to +30 dBm or +10 dBm when the input RF level is set to MS8608A High Power or MS8608A Low power/MS8609A, respectively.

■ Syntax

Program Message	Query Message	Response Message
RNG4	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the measurement range for the power meter to the fourth lowest level.
<Program>
RNG4

■ Restrictions according to model type and options

For MS268x, This command is not available.

RNG5

■ Function

Sets the measurement range for the power meter to the maximum level.

The range value is set to +40 dBm or +20 dBm when the input RF level is set to MS8608A High power or MS8608A Low power/MS8609A, respectively.

■ Syntax

Program Message	Query Message	Response Message
RNG5	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the measurement range for the power meter to the maximum level.

<Program>

RNG5

■ Restrictions according to model type and options

For MS268x, This command is not available.

ROTATION

■ Function

Rotate Demodulation Bit

Rotates the demodulated bit in Demodulation measurement.

Each execution of this command rotates the demodulated bit by 90°

■ Syntax

Program Message	Query Message	Response Message
ROTATION	---	---

■ Use example

To rotate the demodulation data by 180°

<Program>

```
DSPL DEMOD
ROTATION
ROTATION
```

RRCFLT_ADJ

■ Function

Select RRC filtered/not filtered power for adjacent channel power

Sets whether to perform weighting by the RRC filter for the adjacent channel leakage power when Measure Method is set to SPA (All) or SPA (Separate) at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
RRCFLT_ADJ *a*	RRCFLT_ADJ?	*a*

■ Value of a

Value	CF Marker Mode	Initial Value
ON	Measures the adjacent channel leakage power with RRC filter weighting.	
OFF	Measures the adjacent channel leakage power without RRC filter weighting.	*

■ Use example

To perform weighting by RRC filter.

<Program>

DSPL ADJ,SPECT1

RRCFLT_ADJ ON

RRCFLT_ADJ?

<Response>

ON

S1

■ Function

Continuous Measure/Sweep

Executes a measurement and sweeping continuously.

Accepts a command even during measurement. This command functions the same as the CONTS command.

Stops the current measurement and starts with a new measurement when a measurement execution command, such as CONTS command, is received during measurement.

When an operation command not related to the measurement, for example, the INTPOL command or query message, is received during measurement; the current measurement is continued while responding to the received command.

However, when a measurement-related command is received during measurement, the current measurement is stopped and the command is executed.

■ Syntax

Program Message	Query Message	Response Message
S1	---	---

■ Use example

Continuously executes a measurement and sweeping.

<Program>

S1

S2

■ Function

Single Measure/Sweep

Executes a measurement and sweeping once.

Accepts a command even during measurement.

This command functions the same as the SNGLS command.

Stops the current measurement and starts with a new measurement when a measurement execution command, such as SNGLS command, is received for the second time during measurement.

When an operation command not related to the measurement, for example, the INTPOL command or query message, is received during measurement; the current measurement is continued while responding to the command.

However, when a measurement-related command is received during measurement, the current measurement is stopped and the command is executed.

■ Syntax

Program Message	Query Message	Response Message
S2	---	---

■ Use example

Executes a measurement and sweeping once.

<Program>

S2

SAVETR_CCDF

■ Function

Save Reference Trace for CCDF

Save Reference Trace at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
SAVETR_CCDF	SAVETR_CCDF?	*a*

■ Parameter

Value of a

Value	Condition
ON	Save waveform exist.
OFF	Save waveform does not exist.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Saves Reference Trace.

<Program>

DSPL CCDF,CCDF

SAVETR_CCDF

SAVETR_CCDF?

<Response>

ON

SCHPWR

■ Function

SCH Level

Reads out SCH level of Down Link at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
---	SCHPWR? *a*	*b*

■ Parameter

Value of a

Selection of SCH read out

Value	SCH read out
None	Outputs Primary-SCH, Secondary-SCH and Total SCH Level.
PSCH	Outputs Primary-SCH Level.
SSCH	Outputs Secondary-SCH Level.
TSCH	Outputs Total SCH Level.
ALL	Outputs Primary-SCH, Secondary-SCH and Total SCH Level.

Value of b

SCH Level

Resolution	Unit
0.01	dB

■ Restrictions

- This setting is possible only when Scrambling Code & Number is Auto at Setup Common Parameter (*cf.* CODESYNC).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Primary-SCH Level.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

CODESYNC AUTO

DSPL MODANAL

TRFORM CODE

SWP

SCHPWR? PSCH

<Response>

−10.03

SCCODENO_DEMOD

■ Function

Scrambling Code Result for Demodulation

Reads out Scrambling Code used for demodulation at Demodulation screen.

■ Syntax

Program Message	Query Message	Response Message
---	SCCODENO_DEMOD? *a*	*b*

■ Parameter

Value of a

Selection of filter

Value	Selection of filter	Measuring Object (*cf.* MEASOBJ)
None	Reads out Scrambling Code of Normal Frame.	Down Link (Compress)
NF		
CF	Reads out Scrambling Code of Compressed Frame	
None	Reads out Scrambling Code used for demodulation.	Down Link, Up Link

Value of b

Scrambling Code Number

Range (hexadecimal)	Measuring Object (*cf.* MEASOBJ)	Resolution
000000 to FFFFFF	Up Link	1
000000 to 3FFFF	Down Link, Down Link (Compress)	

■ Restrictions

- This setting is not possible when Measuring Object is QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Scrambling Code.

<Program>

DSPL DEMOD

SWP

SCCODENO_DEMOD?

<Response>

000000

SCCODENO_MOD

■ Function

Scrambling Code Result for Modulation Analysis

Reads out Scrambling Code used for demodulation at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
---	SCCODENO_MOD?	*a*

■ Parameter

Value of a

Scrambling Code Number

Range (hexadecimal)	Measuring Object (*cf.* MEASOBJ)	Resolution
000000 to FFFFFF	Up Link	1
000000 to 3FFFF	Down Link, Down Link (Compress)	

■ Restrictions

- This setting is not enabled when Measuring Object is QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Scrambling Code.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

SWP

SCCODENO_MOD?

<Response>

000000

SCNO

■ Function

Channelization Codes Number

Sets the code number for channelization to perform synchronization processing.

■ Syntax

Program Message	Query Message	Response Message
SCNO *code*	SCNO?	*code*

■ Parameter

code

Code number

Range	Spreading Factor Mode (cf.SFMD)	Resolution	Initial Value
0	DPCCH / P-CPICH	---	0
0 to (Spreading Factor value −1)	Set	1	1

- When Spreading Factor Mode is set to DPCCH or P-CPICH, code number is the response value. No setting of the code number is allowed.
- The Spreading Factor value is set with the SF command of the Setup Common Parameter.

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- This setting is not possible when Measuring Object is at Up Link and then Spreading Factor Mode is at DPCCH.
- This setting is not possible when Measuring Object is set to Down Link and then Spreading Factor Mode is set to P-CPICH. (*cf.* SFMD)

■ Initialization command

∗RST

■ Use example

Sets the code number to 120.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

SFMD SET

SF 256

SCNO 120

SCNO?

<Response>

120

SCNO_DEMOD

■ Function

Channelization Code for Demodulation Data

Sets the channelization code at the Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
SCNO_DEMOD *code*	SCNO_DEMOD?	*code*

■ Parameter

code

Channelization code

Range	Resolution	Initial Value
0 to (Spreading factor value −1)	1	1

- The Spreading Factor value is set by the SF_DEMOD command of Demodulation Data.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Channelization Code to 33 when Spreading Factor is 64.

<Program>

DSPL DEMOD

SF_DEMOD 64

SCNO_DEMOD 33

SCNO_DEMOD?

<Response>

33

SCOFS

■ Function

Phase Offset

Sets the rotation angle for the measured result and error scale display when Trace Format is set to Constellation or Eye Diagram at Modulation Analysis measurement

■ Syntax

Program Message	Query Message	Response Message
SCOFS *phase*	SCOFS?	*phase*

■ Parameter

phase

Rotation angle

Value	Rotation Angle	Initial Value
0	0°	*
45	45°	

■ Restrictions

- This setting is not possible when Trace Format is set to other than Constellation or Eye Diagram. (*cf.* TRFORM)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Phase Offset to 45 degrees.

<Program>

MEAS MODANAL

TRFORM CONSTEL

SCOFS 45

SCOFS?

<Response>

45

SETCH_CDVSTM

■ Function

Setup Channel Data for Code vs Time

Sets Spreading Factor and Channelization Code of analyzed when Trace Format is set to Code vs. Time at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
SETCH_CDVSTM *a,b,c*	SETCH_CDVSTM? *c*	*a,b*

■ Parameter

Value of a

Channelization Code

Range	Resolution	Initial Value
0 to (Spreading Factor value −1)	1	1

Value of b

Spreading Factor

Value	Measuring Object	Initial Value
4, 8, 16, 32, 64, 128, 256	Up Link	256
4, 8, 16, 32, 64, 128, 256, 512	Down Link, Down Link (Compress)	256

Value of c

Channel set up

<table>
<tr><th>Value</th><th>Measuring Object</th><th>Channel set up</th></tr>
<tr><td>None</td><td rowspan="3">Up Link</td><td rowspan="2">Sets channel of I-phase of Up Link.</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Sets channel of Q-phase of Up Link.</td></tr>
<tr><td>None</td><td rowspan="2">Down Link</td><td rowspan="2">Sets channel of Down Link</td></tr>
<tr><td>1</td></tr>
<tr><td>None</td><td rowspan="3">Down Link (Compress)</td><td rowspan="2">Sets channel of Down Link
for Normal Frame</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Sets channel of Down Link
for Compressed Frame.</td></tr>
</table>

■ Restrictions

- This setting is possible only when Measuring Object is Up Link, Down Link or Down Link (Compress) (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX 860x01B/MX268x01B.

■ Use example

Sets the channel for Normal Frame to SF = 128, CH = 11 when CF Marker is Manual.

<Program>

DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL MODANAL
TRFORM CDVSTM
CFMKR_MOD MAN
SETCH_CDVSTM NF
CFSC_CDVSTM ALTN
SETCH_CDVSTM 11,128,1
SETCH_CDVSTM? 1

<Response>

11, 128

SETCH_DEMOD

■ Function

Setup Channel Data for Demodulation

Sets Spreading Factor and Channelization Code of analyzed channel at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
SETCH_DEMOD *a,b,c*	SETCH_DEMOD?*c*	*a,b*

■ Parameter

Value of a

Channelization Code

Range	Resolution	Initial Value
0 to (Spreading Factor value −1)	1	1

Value of b

Spreading Factor

Value	Measuring Object	Initial Value
4, 8, 16, 32, 64, 128, 256	Up Link	256
4, 8, 16, 32, 64, 128, 256, 512	Down Link, Down Link (Compress)	256

Value of c

Channel set up

<table>
<tr><th>Value</th><th>Measuring Object</th><th>Channel set up</th></tr>
<tr><td>None</td><td rowspan="3">Up Link</td><td rowspan="2">Sets channel of I-phase of Up Link.</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Sets channel of Q-phase of Up Link.</td></tr>
<tr><td>None</td><td rowspan="2">Down Link</td><td rowspan="2">Sets channel of Down Link</td></tr>
<tr><td>1</td></tr>
<tr><td>None</td><td rowspan="3">Down Link (Compress)</td><td rowspan="2">Sets channel of Down Link
for Normal Frame</td></tr>
<tr><td>1</td></tr>
<tr><td>2</td><td>Sets channel of Down Link
for Compressed Frame.</td></tr>
</table>

■ Restrictions

- This setting is possible only when Measuring Object is Up Link, Down Link or Down Link (Compress) (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets the channel for Normal Frame to SF = 128, CH = 11 when CF Marker is Manual.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL DEMOD
CFMKR_DEMOD MAN
SETCH_DEMOD NF
CFSC_DEMOD ALTN
SETCH_DEMOD 11,128,1
SETCH_DEMOD? 1
```

<Response>

```
11, 128
```

SETREL

■ Function

Set Relative level

Sets the power value (displayed on the Power Meter screen) to the reference value for relative value display.

■ Syntax

Program Message	Query Message	Response Message
SETREL	---	---

■ Restrictions

- This function can be executed only when the displayed measurement screen is the Power Meter screen. (*cf.* DSPL)

■ Use example

Sets the power value (being displayed) to the reference value for relative value display.

<Program>

SETREL

■ Restrictions according to model type and options

For MS268x, this command is not available.

SF

■ Function

Spreading Factor

Sets the spreading factor, which is used when Spreading Factor Mode is set to “Set” on Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
SF *sf*	SF?	*sf*

■ Parameter

sf

Spreading Factor

Value	Measuring Object	Spreading Factor Mode	Initial Value
256	Up Link / Down Link	DPCCH / P-CPICH	256
256, 128, 64, 32, 16, 8, 4	Up Link	Set	64
512, 256, 128, 64, 32, 16, 8, 4	Down Link	Set	64

- When Spreading Factor Mode is set to DPCCH or P-CPICH, the spreading factor is the response value. No Setting of the spreading factor is allowed.

■ Restrictions

- This setting is not possible when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)
- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEAOBJ)
- This setting is not possible when Measuring Object is at Up Link and then the Spreading Factor Mode is set to DPCCH.
- This setting is not possible when Measuring Object is set to Down Link and then the Spreading Factor Mode is set to P-CPICH. (*cf.* SFMD)

■ Initialization command

*RST

■ Use example

Sets Spreading Factor to 128.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

SFMD SET

SF 128

SF?

<Response>
128

SF_CDANAL

■ Function

Spreading Factor for Displayed Code Domain Power

Sets the Spreading Factor of displayed Code Domain Power when Trace Format is set to Code Domain and Auto Rate Detection is set to Off at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
SF_CDANAL *a*	SF_CDANAL?	*a*

■ Value of a

Spreading factor of displayed Code Domain Power

Value	Measuring Object	Initial Value
4, 8, 16, 32, 64, 128, 256	Up Link	256
4, 8, 16, 32, 64, 128, 256, 512	Down Link	256

■ Restrictions

- This setting is not possible when Auto Rate Detection is On (*cf.* AUTODET).
- Maximum spreading factor setup is the value set up by MAXSF when Measuring Object is Down Link or Down Link (Compress) (*cf.* MEASOBJ).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets spreading factor value to 256.

<Program>

```
DSPL MODANAL
AUTODET OFF
SWP
TRFORM CODE
SF_CDANAL 256
SF_CDANAL?
```

<Response>

```
256
```

SF_CDP

■ Function

Spreading Factor for Code Domain
Sets the spreading factor when Trace Format is set to Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
SF_CDP *sf,phase*	SF_CDP? *phase*	*sf*

■ Parameter

sf
Spreading Factor

Value	Measuring Object	Initial Value
4, 8, 16, 32, 64, 128, 256	Up Link	256
4, 8, 16, 32, 64, 128, 256, 512	Down Link	256

phase

Value	Measuring Object
None	Up Link, Down Link
I	Up Link
Q	Down Link

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ)
- *phase* setting is not possible when Measuring Object is set to Down Link. (*cf.* MEASOBJ)
- This setting is not possible when Trace Format is set to other than Code Domain or Code vs. Time. (*cf.* TRFORM).
- This setting is not possible when Auto Rate Detection is set to ON. (cf. AUTODET)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the spreading factor value to 128 at Code Domain display.
<Program>
MEASOBJ UPLNK
DSPL MODANAL
TRFORM CODE
SF_CDP 128
SF_CDP?

<Response>
128

SF_DEMOD

■ Function

Spreading Factor for Demodulation Data
Sets the spreading factor for demodulation at Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
SF_DEMOD *sf*	SF_DEMOD?	*sf*

■ Parameter

sf

Spreading Factor

Value	Measuring Object	Initial Value
4, 8, 16, 32, 64, 128, 256	Up Link	64
4, 8, 16, 32, 64, 128, 256, 512	Down Link	64

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the spreading factor to 32 on the Demodulation screen.
<Program>
DSPL SETCOM
MEASOBJ DNLNK
DSPL DEMOD
SF_DEMOD 32
SF_DEMOD?

<Response>
128

SFDPCH

■ Function

Spreading Factor for DPCH

Sets the spreading factor value for DPCH on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
SFDPCH *sf*	SFDPCH?	*sf*

■ Parameter

sf

Spreading Factor

Value	Initial Value
4, 8, 16, 32, 64, 128, 256, 512	64

■ Restrictions

- This setting is not possible when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)
- Measuring Object must be set to Down Link. (*cf.* MEASOBJ)
- This setting is not possible when Measuring Object is set to Down Link and then Spreading Factor Mode is set to “Set”. (*cf.* SFMD)

■ Initialization command

∗RST

■ Use example

Sets the spreading factor for DPCH to 32.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

SFMD PCPICH

SFDPCH 32

SFDPCH?

<Response>

32

SFDPDCH

■ Function

Spreading Factor for DPDCH

Sets the spreading factor value for DPDCH on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
SFDPDCH *sf*	SFDPDCH?	*sf*

■ Parameter

sf

Spreading Factor

Vale	Initial Value
4, 8, 16, 32, 64, 128, 256	64

■ Restrictions

- This setting is not possible when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)
- Measuring Object must be set to Up Link. (*cf.* MEASOBJ)
- This setting is not possible when Measuring Object is at Up Link and then Spreading Factor Mode is set to “Set”. (*cf.* SFMD)

■ Initialization command

∗RST

■ Use example

Sets the spreading factor for DPDCH to 32.

<Program>

DSPL SETCOM

MEASOBJ UPLNK

SFMD DPCCH

SFDPDCH 32

SFDPDCH?

<Response>

32

SFMD

■ Function

Spreading Factor Mode

Specifies whether to set the spreading factor for synchronization processing to DPCCH or P-CPICH, or to manually set the spreading factor

■ Syntax

Program Message	Query Message	Response Message
SFMD *sfmode*	SFMD?	*sfmode*

■ Parameter

sfmode

Spreading Factor Mode

Range	Spreading Factor Mode	Initial Value	Measring Object
DPCCH	DPCCH	*	Up Link
SET	Set		
PCPICH	P-CPICH	*	Down Link
SET	Set		

■ Restrictions

- This setting is not possible when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)
- Measuring Object must be set to Up Link or Down Link. (*cf.* MEASOBJ)

■ Initialization command

*RST

■ Use example

Sets Spreading Factor and Channelization Code Number to DPCCH

<Program>

DSPL SETCOM

MEASOBJ UPLNK

SFMD DPCCH

SFMD?

<Response>

DPCCH

SIGNATURE

■ Function

Preamble RACH Signature For Transmitter Power (RACH)

Outputs Preamble RACH Signature when Measure Method is set to RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SIGNATURE?	*a*

■ Parameter

Value of a

Preamble Signature

Range	Resolution
0 to 15	1

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Signature.

<Program>

DSPL SETCOM

MEASOBJ UPLNKRACH

DSPL RFPWR,RACH

SWP

SIGNATURE?

<Response>

1

SLCTTEMP_SMASK

■ Function

Select Template for Spectrum Emission Mask

Sets the standard template in the Setup Template screen during Spectrum Emission Mask measurement.

Select Up Link or Down Link template by using the TEMPTYPE_SMASK command.

■ Syntax

Program Message	Query Message	Response Message
SLCTTEMP_SMASK *a*	SLCTTEMP_SMASK?	*a*

■ Value of a

Value	Standard	Initial value
STD	Template value within 3GPP standards.	*

- NOT is returned when the template value exceeds the standard.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

To set the Up Link template.

<Program>

DSPL SETTEMP
TEMPTYPE_SMASK UPLNK
SLCTTEMP_SMASK STD
TEMPTYPE_SMASK?
SLCTTEMP_SMASK?

<Response>

UPLNK
STD

SLT_DEMOD

■ Function

Read out Demodulation Data in Slot Unit

Outputs Demodulation data in slot unit at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SLT_DEMOD? *a,b,c,d*	*e*

■ Parameter

Value of a

Start slot number for reading out

Range	Resolution
1 to (Demodulation Freme * 15)	1

Demodulation Frame is set up by FRMDM

Value of b

Slot Length for reading out

Range	Resolution
1 to ((Demodulation Factor * 15) −a + 1)	1

Value of c

Output format

Vale	Output format
None	Outputs by decimal.
DEC	Outputs by decimal.
HEX	Outputs by hexadecimal.

Value of d

Trace or reading out

Vale	Trace of reading out
None	Reads out demodulation data of Normal Frame.
NF	Reads out demodulation data of Normal Frame.
CF	Reads out demodulation data of Compressed Frame.

Value of e

Demodulation data

Range	Resolution	Output format
0 to 65535	1	Decimal
0 to FFFF	1	Hexadecimal

■ Restrictions

- Readout is not possible when Measuring Object is set to UP Link (RACH) or QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out 3 slot from slot 2.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL DEMOD
SWP
SLTDEMOD? 2,3,DEC
```

<Response>

11, 128,…

SLTAVG_MOD

■ Function

Averaged Code Domain Power in slot Modulation for Code vs Time

Reads out Averaged Code Domain Power of Code vs. Time waveform in slot at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SLTAVG_MOD? *a,b*	*c,d*

■ Parameter

Value of a

Output waveform

Measuring Object	Initial value	Output waveform
Up Link	0	Output Total Power of the slot filtered by the filter selected by Filter. (*cf.* FLTTYPE?MOD)
	1	Output Code Domain Power of setup channel for Normal Frame.
	2	Output Code Domain Power of setup channel for Compressed Frame.
	ALL	Output Total Power and Code Domain Power of setup channel for Normal Frame and Compressed Frame.
Down Link	0	Output Total Power of the slot filtered by the filter selected by filter (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel.
	ALL	Output Total Power and Code Domain Power
Down Link (Compress)	0	Output Total Power of the slot filtered by the filter selected by Filter. (*cf.* FLTTYPE?MOD)
	1	Output Code Domain Power of setup channel for I -phase.
	2	Output Code Domain Power of setup channel for Q-phase.
	ALL	Output Total Power and Code Domain Power of setup channel for I -phase and Q-phase.

Value of b

Output unit

Value	Unit
None	dB, dBm
REL	dB
ABS	dBm

Value of c

Power of setup channel (Relative Power)

Resolution	Unit
0.01	dB

If value of a is 0 or value of b is ABS, relative value is not outputted.

Value of d

Power of setup channel (Absolute Power)

Resolution	Unit
0.01	dBm

If value of b is REL, absolute value is not outputted.

■ Restrictions

- This setting is not possible when Measuring Object set to QPSK (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out averaged relative power and absolute power of CPICH in Down Link.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
SETCH_CDVSTM 0,256
SWP
SLTAVG_MOD? 1
```

<Response>

−1.59, 0.84

SLTAVGCARRFERR

■ Function

Carrier Frequency Error in Slot for Code vs Time

Outputs averaged Carrier Frequency Error of Code vs. Time waveform of all slot at Modulation Analysis Measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SLTAVGCARRFERR? *unit*	*freq*

■ Parameter

Value of unit

Readout unit

Value	Readout unit
None	Hz
HZ	Hz
PPM	ppm

Value of freq

Averaged Carrier Frequency Error of all slots. The unit depends on the parameter “unit”.

Resolution	Unit
0.1	Hz
0.001	ppm

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out averaged Carrier Frequency Error in measured slot.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

TRFORM CDVSTM

SWP

SLTAVGCARRFERR? HZ

<Response>

10.1

SLTAVGSCCODENO

■ Function

Scrambling code number in Slot for Code vs Time

Outputs out Scrambling code number of Code vs. Time waveform in last slot.

■ Syntax

Program Message	Query Message	Response Message
---	SLTAVGSCCODENO? ALL	*num,jud*
---	SLTAVGSCCODENO? NUMBER	*num*
---	SLTAVGSCCODENO? JUDGE	*jud*

■ Parameter

Value of num

Scrambling code number in last slot

Resolution	Unit
1	None

Value of jud

Judge whether scrambling code number maintains during one measurement.

Judgment

Value	Judgment result
OFF	Unmeasured
PASS	All scrambling code number are in a agreement.
FAIL	There are defferent Scrambling code numbers

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.
- This command can be used only when the measuring object is Down Link.
- Judgment is always PASS when Scrambling Code Sync is “Set”, because Scrambling Code Number is set by user.

■ Use example

Reads out Scrambling code number and Judgement result.

<Program>

DSPL SETCOM

MEASOBJ DNLNK

DSPL MODANAL

TRFORM CDVSTM

SWP

SLTAVGSCCODENO?

<Response>
00070, PASS

SLTCARRFERR

■ Function

Carrier Frequency Error in Slot for Code vs Time

Output Carrier Frequency Error of Code vs. Time waveform in selected slots.

■ Syntax

Program Message	Query Message	Response Message
---	SLTCARRFERR? *n,unit*	*freq*

■ Parameter

Value of n

Slot number

Range	Resolution
1 ~ 150	1
ALL	---

When “ALL” is selected, Carrier Frequency Error is outputted in order of a1, a2, … and a150. However, that the value of outputs on depends on Slot Length which is set by SLTLEN_MOD.

Value of unit

Readout unit

Range	Resolution
None	Hz
HZ	Hz
PPM	ppm

Value of freq

Frequency Error of the slot the setting points. The unit depends on the parameter “unit.”

Resolution	Unit
0.1	Hz
0.001	ppm

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Carrier Frequency Error in slot 4.

<Program>

```
DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
SWP
SLTCARRFERR? 4,HZ
```

<Response>

```
10.1
```

SLTCDPWR

■ Function

Code Domain Power in slot for Code vs Time
Outputs Code Domain Power of Code vs. Time waveform in slot.

■ Syntax

Program Message	Query Message	Response Message
---	SLTCDPWR? *a,b, c*	*d, e*

■ Parameter

Value of a

Output waveform

Measuring Object	Value	Output waveform
Up Link	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel for Normal Frame.
	2	Output Code Domain Power of setup channel for Compressed Frame.
	ALL	Output Total Power and Code Domain Power of setup channel for Normal Frame and Compressed Frame.
Down Link	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel.
	ALL	Output Total Power and Code Domain Power.
Down Link (Compress)	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel for Normal Frame.
	2	Output Code Domain Power of setup channel for Compressed Frame.
	ALL	Output Total Power and Code Domain Power of setup channel for Number Frame and Compressed Frame.

Value of b

Slot number

Range	Resolution
1 to 150	1
ALL	---

When “ALL” is selected, Carrier Frequency Error is outputted in order of a1, a2, … and a150. Note, however, that the value of outputs on depends on Slot Length which is set by SLTLEN_MOD.

Value of c

Output unit

Value	Unit
None	dB, dBm
REL	dB
ABS	dBm

Value of d

Power of setup channel (Relative Power)

Resolution	Unit
0.01	dB

When the value of *c* is ABS, Relative Power will be not replied.

Value of e

Power of setup channel (Absolute Power)

Resolution	Unit
0.01	dBm

When the value of *c* is REL, Absolute Power will be not replied.

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Relative Power and Absolute Power in slot 4 for Compressed Frame.

<Program>

DSPL SETCOM
MEASOBJ DNLNKCOMP
DSPL MODANAL
TRFORM CDVSTM
SWP
SLTCDPWR? 2,4

<Response>

−1.59, 0.84

SLTCDPWR_DEMOD

■ Function

Code Domain Power in slot for Code vs Time

Outputs Code Domain Power of Code vs. Time waveform in slot at Demodulation measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SLTCDPWR? *a,b, c*	*d, e*

■ Parameter

Value of a

Output waveform

Measuring Object	Value	Output waveform
Up Link	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel for Normal Frame.
	2	Output Code Domain Power of setup channel for Compressed Frame.
	ALL	Output Total Power and Code Domain Power of setup channel for Normal Frame and Compressed Frame.
Down Link	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel.
	ALL	Output Total Power and Code Domain Power.
Down Link (Compress)	0	Output Total Power of the slot filtered by the filter Selected by Filter. (*cf.* FLTTYPE_MOD)
	1	Output Code Domain Power of setup channel for Normal Frame.
	2	Output Code Domain Power of setup channel for Compressed Frame.
	ALL	Output Total Power and Code Domain Power of setup channel for Number Frame and Compressed Frame.

Value of b

Slot number

Range	Resolution
1 to 150	1
ALL	---

When "ALL" is selected, Carrier Frequency Error is outputted in order of a1, a2, … and a150. Note, however, that the value of outputs on depends on Slot Length which is set by SLTLEN_MOD.

Value of c

Output unit

Value	Unit
None	dB, dBm
REL	dB
ABS	dBm

Value of d

Power of setup channel (Relative Power)

Resolution	Unit
0.01	dB

When the value of *c* is ABS, Relative Power will be not replied.

Value of e

Power of setup channel (Absolute Power)

Resolution	Unit
0.01	dBm

When the value of *c* is REL, Absolute Power will be not replied.

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Relative Power and Absolute Power in slot 4 for Compressed Frame.

<Program>

DSPL SETCOM

MEASOBJ DNLNKCOMP

DSPL DEMOD

SWP

SLTCDPWR_DEMOD? 2,4

<Response>

−1.59, 0.84

SLTFORM

■ Function

Slot Format for DPCCH.
sets DPCCH slot format number to determine absolute phase.

■ Syntax

Program Message	Query Message	Response Message
SLTFORM *n*	SLTFORM?	*n*

■ Parameter

Value of n
Slot format number of DPCCH

Range	Mode	Initial Value
0	Use slot format number 0	*
1	Use slot format number 1	
2	Use slot format number 2	
3	Use slot format number 3	
4	Use slot format number 4	
5	Use slot format number 5	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This setting is enabled when Measuring Object is set to Up Link (*cf.* MEASOBJ).
- This setting is enabled when Spreading Factor is set to DPCCH (*cf.* SFMD).
- This command can be used only when using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets to use Slot format number 2.
<Program>
DSPL SETCOM
MEASOBJ UPLINK
SFMD DPCCH
SWP
SLTFORM 2
SLTFORM?

<Response>
2

SLTFORMAT_DEMOD

■Function

At Demodulation Data measurement, if performing phase correction corresponding to phase control for Antenna 2 in Closed Loop Mode, then the Slot Format of demodulation target DPCH is specified.

■Syntax

Program Message	Query Message	Response Message
SLTFORMAT_DEMOD *format*	SLTFORMAT_DEMOD?	*format*

■Parameter

format

Selecting Slot Format

Value	Slot Format
0	Demodulates the Code Channel of Slot Format 0 .
1	Demodulates the Code Channel of Slot Format 1 .
2	Demodulates the Code Channel of Slot Format 2 .
3	Demodulates the Code Channel of Slot Format 3 .
4	Demodulates the Code Channel of Slot Format 4 .
5	Demodulates the Code Channel of Slot Format 5 .
6	Demodulates the Code Channel of Slot Format 6 .
7	Demodulates the Code Channel of Slot Format 7 .
8	Demodulates the Code Channel of Slot Format 8 .
9	Demodulates the Code Channel of Slot Format 9 .
10	Demodulates the Code Channel of Slot Format 10 .
11	Demodulates the Code Channel of Slot Format 11 .
12	Demodulates the Code Channel of Slot Format 12 .
13	Demodulates the Code Channel of Slot Format 13 .
14	Demodulates the Code Channel of Slot Format 14 .
15	Demodulates the Code Channel of Slot Format 15 .
16	Demodulates the Code Channel of Slot Format 16 .

■Initialization command

PRE, INI, IP, ＊RST

■Restrictions

- Measuring Object must be set to Down Link or Down Link (Compress) beforehand (*cf.* MEASOBJ).
- Available only for MX860x01B/MX268x01B.
- Valid conditions of Parameter are shown in the table below.

		Closed Loop Mode	
		Mode 1	Mode 2
Spreading Factor	512	0*,1	0*,1
	256	4*,5,6,7	2*,3,4,5,6,7
	128	8*,9,10,11	8*,9,10,11
	64	12*	12*
	32	13*	13*
	16	14*	14*
	8	15*	15*
	4	16*	16*

“ * ” indicates the Initial value in each condition.

■Use example

Sets the Slot Format of demodulation target DPCH to 4.

<Program>

```
MEASOBJ DNLNK
DSPL DEMOD
SF_DEMOD 256
SLTFORMAT_DEMOD 4
SLTFORMAT_DEMOD?
```

<Response>

```
4
```

SLTLEN_MOD

■ Function

Analysis Slot Length for Code vs Time

Sets up Analysis Length when Trace Format is set to Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
SLTLEN_MOD *a*	SLTLEN_MOD?	*a*

■ Parameter

Value of a

Analysis slot length

Range	Resolution	Initial Value
15 to 150	1	30

■ Restrictions

- This setting is not possible when Measuring Object is set to Up Link (RACH), QPSK (*cf.* MEASOBJ).
- This command can be used only when using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets analysis slot length to 150.0

<Program>

DSPL SETCOM

MEASOBJ DNLNKCOMP

DSPL MODANAL

TRFORM CDVSTM

SLTLEN_MOD 150

SLTLEN_MOD?

<Response>

150

SLTLEN_RFPWR

■ Function

Analysis slot Length for Transmitter Power (TPC)
Sets Analysis Slot Length when Measure Method is set to TPC at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
SLTLEN_RFPWR *a*	SLTLEN_RFPWR?	*a*

■ Parameter

Value of a

Analysis slot length

Range	Resolution	Initial Value
15 to 150	1	15

■ Restrictions

- This setting is possible only when Measure Method is TPC (*cf.* DSPL).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets analysis slot length to 150.

<Program>
DSPL RFPWR,TPC
SLTLEN_RFPWR 150
SLTLEN_RFPWR?

<Response>
150

SLTPWR

■ Function

Slot Power

Outputs the average power of each slot at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SLTPWR? *slot*	*relpwr,abspwr*
---	SLTPWR? *slot*,REL	*relpwr*
---	SLTPWR? *slot*,ABS	*abspwr*
---	SLTPWR? ALL	*relpwr1,abspwr1,…,relpwrN,abspwrN…,relpwr15,abspwr15*
---	SLTPWR? ALL,REL	*relpwr1,relpwr2,…,relpwrN,…,relpwr15*
---	SLTPWR? ALL,ABS	*abspwr1,abspwr2,…,abspwrN,…,abspwr15*

■ Parameter

slot

Slot number

Range	Resolution
1 to Slot Length	1

Slot Length: Analysis Slot Length set up by Slot Length. (*cf.* SLTLEN_RFPWR)

relpwr, relpwerN

Relative power to the previous slot (*N* represents the slot number.)

Resolution	Unit
0.01	dB

abspwr, abspwrN

Absolute power of the specified slot (*N* represent the slot number.)

Resolution	Unit
0.01	dBm

■ Use example

Reads out the relative and absolute power of Slot 4.

<Program>

DSPL RFPWR,TPC

SWP

SLTPWR? 4

<Response>

−1.59, 0.84

SLTSCCODENO

■ Function

Scrambling code number in Slot for Code vs Time

Outputs Scrambling code number of Code vs. Time waveform in selected slots.

■ Syntax

Program Message	Query Message	Response Message
---	SLTSCCODENO? *n*	*a*

■ Parameter

Value of n

Slot Number

Range	Resolution
1 ~ 150	1
ALL	---

When “ALL” is selected, Scrambling code number is outputted in order of a1, a2, … and a150. However, that the value of outputs depends on Slot Length which is set by SLTLEN_MOD.

Value of a

Scrambling code number in selected slot.

Resolution	Unit
1	None

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out Scrambling code number in slot 4.

<Program>

DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
SWP
SLTSCCODENO? 4

<Response>

00070

SMOFLT

■ Function

Smoothing Filter

Sets whether to perform waveform smoothing on the Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
SMOFLT *a*	SMOFLT?	*a*

■ Value of a

On/Off for waveform smoothing

Value	On/Off for Waveform Smoothing	Initial Value
ON	Performs waveform smoothing.	*
OFF	Does not perform waveform smoothing.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

To perform waveform smoothing.

<Program>

DSPL RFPWR

SMOFLT ON

SMOFLT?

SWP

<Response>

ON

SNGLS

■ Function

Single Measure/Sweep

Executes a measurement or sweeping once.

Accepts a command even during measurement.

This command functions the same as the S2 command.

Stops the current measurement and starts with a new measurement when a measurement execution command, such as SNGLS command, is received for the second time during measurement.

When an operation command not related to the measurement, for example, the INTPOL command or query message, is received during measurement; the current measurement is continued while responding to the command.

However, when a measurement-related command is received during measurement, the current measurement is stopped and the received command is executed.

■ Syntax

Program Message	Query Message	Response Message
SNGLS	---	---

■ Use example

Executes a measurement or sweeping once.

<Program>

SNGLS

SPLITSWP_SPU

■ Function

Split Sweep for Spurious Emission (Search/Sweep)

Sets whether Split Sweep performed or not, When Spurious Mode is Search or Sweep at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
SPLITSWP_SPU *a*	SPLITSWP_SPU?	*a*

■ Value of a

On/Off for Split Sweep

Value	On/Off for Split Sweep	Initial Value
ON	Performs Split Sweep.	*
OFF	Does not perform Split Sweep	

■ Initialization command

RRE, INI, IP, *RST

■ Use example

Performs Split Sweep.

<Program>

SPLITSWP_SPU ON

SPLITSWT_SPU?

<Response>

ON

SPREV

■ Function

Input Spectrum Normal/Reverse

Sets Spectrum Normal/Reverse.

■ Syntax

Program Message	Query Message	Response Message
SPREV *a*	SPREV?	*a*

■ Value of a

Setting Input Spectrum to On or Off

Value	Settng Input Spectrum to On or Off	Initial Value
ON	Reverse: Performs Spectrum Reverse.	*
OFF	Normal: Does not performs Spectrum Reverse.	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Performs Spectrum Reverse.

<Program>

SPREV ON

SPREV?

<Response>

ON

SPUALL

■ Function

Frequency, Level, RBW, VBW, Sweep Time

Outputs simultaneously the measurement result of Frequency, Level, RBW, VBW and Sweep Time, on the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
---	SPUALL? *Fa, b, c*	*d(a),e(a),f(a),g(a),h(a)* *d(a+1),e(a+1),f(a+1),g(a+1),h(a+1),...* *d(b),e(b),f(b),g(b),h(b)*

■ Value of a

Start frequency point for reading out

Range	Resolution
1 to 15	1

■ Value of b

Number of reading out

Range	Resolution
1 to 15	1

■ Value of c

Output unit

Value	Unit
None	Conforms to unit set by Unit. (cf. UNIT_SPU)
DBM	dBm
DB	dB

■ Value of d: Frequency measurement result

Same as *c* of SPUFREQ

■ Value of e: Level measurement result

Same as *d* of SPULVL

■ Value of f: RBW

Same as *c* of SPURBW

■ Value of g: VBW

Same as *c* of SPUVBW

■ Value of h: Sweep Time

Same as *c* of SPUSWT

■ Use example

Reads out all result of f1 to f2.

<Program>
DSPL SPURIOUS, SEARCH
SWP
SPUALL? F1,2

<Response>
1775300000, −33.97, 1000, 3000, 200000, 2162950000, −37.87, 10000, 30000, 600000

SPUATT

■ Function

Attenuator for Spurious Emission

Outputs Attenuator during measurement at Spurious Emission measurement.

In Spurious Mode of Spot, outputs Attenuator set on Setup Spot Table screen.

In Spurious Mode of Search or Sweep, outputs Attenuator set on Setup Search/Sweep Table screen (*cf.* TBLATT_SPU).

■ Syntax

Program Message	Query Message	Response Message
---	SPUATT? *Fa,b,*	*c*

■ Value of a

Frequency point of readout start

Range	Resolution
1 to 15	1

■ Value of b

Number of frequency points of readout start

Range	Resolution
1 to 15	1

■ Value of c

Attenuator

Resolution	Unit
1	dB

□ Suffix code

None

■ Initialization Value

PRE, INI, IP, *RST

■ Use example

Reading out Attenuator from f1 to f3

<Program>

SPUATT? F1,3

<Response>

60, 61, 62

SPUFREQ

■ Function

Reads out the Spurious frequencies in each frequency table at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SPUFREQ? *Ftable_no, n*	*freq(table_no), freq(table_no+1),...,* *freq(table_no+n−1)*

■ Parameter

table_no

Frequency table No. to be read first

Value	Resolution
1 to 15	1

n

Number of readout data

Range	Resolution
1 to 15	1

freq(table_no)

Spurious frequencies on the table number (*table_no)*

Resolution	Unit
1	Hz

■ Use example

Reads out spurious frequencies from f2 thru f4 in the Spot Mode.

<Program>

DSPL SPURIOUS, SPOT

SWP

SPUFREQ? F2, 3

<Response>

1775300000, 1776200000, 1776110000

SPUFREQLVL

■ Function

Reads out the spurious frequencies and the spurious level on each frequency table at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SPUFREQLVL? *Ftable_no,n,unit*	*freq(table_no)* *level(table_no),freq(table_no+1),level(table_no+1)* *…,freq(table_no+n−1),level(table_no+n−1)*

■ Parameter

table_no

Frequency table No. to be read first

Range	Resolution
1 to 15	1

n

Number of readout data

Range	Resolution
1 to 15	1

unit

Unit of *level* (spurious level) output

Value	Unit
None	Depends on current set unit
DBM	dBm
DB	dB

freq(table_no)

Spurious frequency on the table number *(table_no)*

Resolution	Unit
1	Hz

level(table_no)

Spurious levels on the table number *(table_no)*

Resolution	Unit
1	Depends on the value specified by unit

■ Use example

Reads out the spurious frequencies and the spurious level in dBm units from f2 thru f4 in the Spot Mode.

<Program>

DSPL SPURIOUS,SPOT

SWP

SPUFREQLVL? F2,4,DBM

<Response>

1775300000, −56.23, 1776200000, −42.94, 1776110000, −58.71

SPUJDG

■ Function

Total Judgment

Reads out the total result of Level pass/fail judgment by means of the Limit value on the Spurious Emission screen. If the Spurious Mode is Spot, judge with the Limit value set on the Setup Spot table screen as the reference, and if Search or Sweep, use the Limit value set on the Setup Search/Sweep Table screen.

■ Syntax

Program Message	Query Message	Response Message
---	SPUJDG?	*a*

■ Value of a

Judgment result

Value	Pass/Fail judgment
PASS	Pass
FAIL	Fail
OFF	Unmeasured

■ Restrictions

- In order to Pass, all valid measurements from f1 to f15 must be completed, and the result of judgment of each point must be Pass.
- Fail would result if the judgment result is Fail on any voluntary valid measurement from f1 to f15.

■ Use example

Reads out total result of pass/fail judgment.

<Program>

DSPL SPURIOUS, SWEEP

SWP

SPUJDG?

<Response>

PASS

SPUJUDGLVL

■ Function

Judge Level for Spurious Emission
Reads out Judge Limit and Unit at Spurious Emission.

■ Syntax

Program Message	Query Message	Response Message
---	SPUJUDGLVL? *Fa,b*	*c,d*

■ Parameter

Value of a
Read-starting frequency table number

Range	Resolution
1 to 15	1

Value of b
Readout number

Range	Resolution
1 to 15	1

Value of c
Limit

Range	Resolution	Initial Value
−100.00 to 100.00	0.01	0.00

Value of d
Readout unit

Value	Unit
DBM	dBm
DB	dB

□ Suffix code

None

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Reads out Judge Limit from f1 to f3.

<Program>

DSPL SPURIOUS,SPOT

SPUJUDGLVL? F1,3

<Response>

10.00, DBM, 10.00, DBM, 10.00, DBM

SPULMT

■ Function

Judge Limit for Spurious Emission
Sets Judge Limit at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
SPULMT *a,Fb,c,d*	SPULMT? *a,Fb,d*	*c*

■ Value of a

Select of Measure Method

Value	Measure Method
SPOT	Target limit value for Spot method measurement
SWEEP	Target limit value for Search method measurement or Sweep Method measurement

Value of b

Frequency point

Range	Resolution
1 to 15	1

Value of c

Judge Limit

Range	Resolution	Initial Value	Unit
−100.00 to 100.00	0.01	Refer to Initial Value of TBLFREQ_SPU.	dBm

Value of d

Output format

Value	Output
None	Outputs Absolute Limit
ABS	
REL	Outputs Relative Limit

□ Suffix code

None

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets judge limit for Search method measurement to −13.00 dBm.

<Program>

DSPL SPURIOUS, SWEEP

SWP

SPULMT SWEEP,F1,−13.00

SPULMT? SWEEP,F1

<Response>

−13.00

SPULVL

■ Function

Reads out the spurious levels in each frequency table at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
---	SPULVL? *Ftable_no,n,unit*	*level(table_no),level(table_no+1),...,level(table_np+n−1)*

■ Parameter

table_no

Frequency table No. to be read first

Range	Resolution
1 to 15	1

n

Number of readout data

Range	Resolution
1 to 15	1

unit

Unit of *level* (spurious level) output

Value	Unit
None	Depends on current set unit.
DBM	dBm
DB	dB

level(table_no)

Spurious level for the table number (table_no)

Resolution	Unit
1	Depends on the value set by *unit*.

■ Use example

Reads out spurious level in dBm unit from f2 thru f4 in the Spot Mode.

<Program>

DSPL SPURIOUS, SPOT

SWP

SPURLVL? F2,4,DBM

<Response>

−56.23, −42.94, −58.71

SPUPASS

■ Function

Judgment

Reads out the pass/fail judgment result of Level by means of Limit value on the Spurious Emission screen. When the Spurious Mode is Spot, the Limit value set on the setup Spot Table screen is used as the reference for judgment, and when the Search or Sweep, the Limit value set on the Setup Search/Sweep Table screen is used.

■ Syntax

Program Message	Query Message	Response Message
---	SPUPASS? *a*	*b*

■ Value of a

Frequency point

Value	Frequency point
Fn	Reads out result of certain frequency point (n: 1-15)
ALL	Reads out the result of all frequency point at one time.

■ Value of b

Judgment Result

Value	Pass/File Judgement
PASS	Pass
FAIL	Fail
OFF	Unmeasured

■ Use example

Reads out the result of Pass/Fail judgment of f3.

<Program>

DSPL SPURIOUS, SWEEP

SWP

SPUPASS? F3

<Response>

PASS

SPURBW

■ Function

RBW

Outputs the RBW value at the measurement on the Spurious Emission screen.

When the Spurious Mode is Spot, the RBW set On the Setup Spot Table screen is output, and when the Search or Sweep, the RBW set on the Setup Search/Sweep Table screen is output (cf. TBLRBW_SPU).

■ Syntax

Program Message	Query Message	Response Message
---	SPURBW? *Fa,b*	*c(a),c(a+1),...,c(b)*

■ Value of a

Start frequency point for reading out

Range	Resolution
1 to 15	1

■ Value of b

Number of reading out

Range	Resolution
1 to 15	1

■ Value of c

RBW

Resolution	Unit
1	Hz

■ Use example

Read out of RBW from f1 to f3.

<Program>

DSPL SPURIOUS,SEARCH

SWP

SPURWB? F1,3

<Response>

1000, 10000, 100000

SPURL

■ Function

Ref Level for Spurious Emission

Outputs Ref Level during measurement at Spurious Emission measurement.

In Spurious Mode of Spot, outputs Ref Level set on Setup Spot Table screen.

In Spurious Mode of Search or Sweep, outputs Ref Level set on Setup Search/Sweep Table screen (*cf.* TBLARL_SPU).

■ Syntax

Program Message	Query Message	Response Message
---	SPURL? *Fa,b*	*c*

■ Value of a

Start frequency point for reading out

Range	Resolution
1 to 15	1

■ Value of b

Number of frequency points of readout

Range	Resolution
1 to 15	1

■ Value of c

Ref Level

Resolution	Unit
0.01	dBm

□ Suffix code

None

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Reads out Ref Level from f1 to f3.

<Program>

SPURL? F1,3

<Response>

50.00, 51.00, 52.00

SPUSWT

■ Function

Sweep Time

Outputs the Sweep Time value at the time of measurement on the Spurious Emission screen. When the Spurious Mode is Spot, the Sweep Time set on the Setup Spot Table screen is output, and when Search or Sweep, the Sweep Time set on the Setup Search/Sweep Table screen is output (*cf.* TBLSWT_SPU).

■ Syntax

Program Message	Query Message	Response Message
---	SPUSWT? *Fa,b*	*c(a),c(a+1),...,c(b)*

■ Value of a

Start frequency point for reading out

Range	Resolution
1 to 15	1

■ Value of b

Number of readouts

Range	Resolution
1 to 15	1

■ Value of c

Sweep Time

Resolution	Unit
1	μs

■ Use example

Reads out Sweep Time from f1 to f3.

<Program>

DSPL SPURIOUS,SEARCH

SWP

SPUSWT?F1,3

<Response>

200000, 600000, 500000

SPUVBW

■ Function

VBW

Outputs the VBW value at the measurement on Spurious Emission screen.

When the Spurious Mode is Spot, outputs VBW set on the Setup Spot Table screen, and when Search or Sweep, outputs VBW set on the Setup Search/Sweep Table screen (*cf.* TBLVBW_SPU).

■ Syntax

Program Message	Query Message	Response Message
---	SPUVBW? *Fa,b*	*c(a),c(a+1),...c(b)*

■ Value of a

Start frequency point for reading out

Range	Resolution
1 to 15	1

■ Value of b

Number of reading out

Range	Resolution
1 to 15	1

■ Value of c

VBW

Resolution	Unit
1	Hz

■ Use example

Read out VBW from f1 to f3.

<Program>

DSPL SPURIOUS,SEARCH

SWP

SPUVBW? F1,3

<Response>

3000, 30000, 300000

SSCALE

■ Function

Square Scale for Constellation and Eye Diagram
Sets the Square Scale when Trace Format is set to Constellation or Eye Diagram at Modulation Analysis screen. (*cf.* TRFORM)

■ Syntax

Program Message	Query Message	Response Message
SSCALE *a*	SSCALE?	*a*

■ Value of a

Start frequency point for reading out

Range	Vertical Scale Range	Initial Value
1	Displays 1 time scale.	*
2	Displays 2 time scale.	
5	Displays 5 time scale.	
10	Displays 10 time scale.	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets scale of Constellation to 5 times display.
<Program>
MEAS MODANAL
TRFORM CONSTEL
SSCALE 5
SSCALE?

<Response>
5

STDFC1

■ Function

Select Standard Frequency Table for Spurious Emission

Sets the carrier frequency (Fc1) when the standard value of frequency table is set to BS Category B during spurious measurement. Set the lowest carrier frequency here.

■ Syntax

Program Message	Query Message	Response Message
STDFC1 *a*	STDFC1?	*a*

■ Value of a

Fc1 setting

Frequency	Resolution	Initial Value
2110000000 to 2170000000	1	2110000000

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the carrier frequency (Fc1) for BS Category B to 2150 MHz.

<Program>

DSPL SETTBL_SPU,SWEEP

STDFC1 2150000000

STDFC1?

<Response>

2150000000

STDFC2

■ Function

Select Standard Frequency Table for Spurious Emission

Sets the carrier frequency (Fc2) when the standard value for frequency table is set to BS Category B during spurious measurement. Set the highest carrier frequency here.

■ Syntax

Program Message	Query Message	Response Message
STDFC2 *a*	STDFC2?	*a*

■ Value of a

Fc2 setting

Frequency	Resolution	Initial Value
2110000000 to 2170000000	1	2110000000

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets the carrier frequency (Fc2) for BS Category B to 2150MHz.

<Program>

DSPL SETTBL_SPU,SWEEP

STDFC2 2150000000

STDFC2?

<Response>

2150000000

STM_ADJ

■ Function

Sweep Time: Manual/Auto
Sets either manual or automatic operation for the Sweep Time setting on the Adjacent Channel Power screen.

■ Syntax

Program Message	Query Message	Response Message
STM_ADJ *a*	STM_ADJ?	*a*

■ Value of a

Sweep Time setting mode

Value	Mode	Initial value
MAN	Putting Sweep Time on manual setting mode.	
AUTO	Putting Sweep Time on automatic setting mode.	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Sweep Time is changed during Auto, the system compulsorily becomes Manual.
- In the Auto, the value of Sweep Time is automatically set from the value of RBW, VBW and others.

■ Use example

Set the Sweep Time to automatically setting mode.
<Program>
STM_ADJ AUTO
STM_ADJ?

<Response>
AUTO

STM_OBW

■ Function

Sweep Time: Manual/Auto

Sets either manual or automatic operation for the Sweep Time setting on the Occupied Bandwidth screen.

■ Syntax

Program Message	Query Message	Response Message
STM_OBW *a*	STM_OBW?	*a*

■ Value of a

Sweep Time setting mode

Value	Mode	Initial value
MAN	Putting Sweep time on manual setting mode.	
AUTO	Putting Sweep time on automatic setting mode.	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Sweep Time is changed during Auto, the system compulsorily becomes Manual.
- In the Auto, the value of Sweep Time is automatically set from the value of RBW, VBW and others.

■ Use example

Set the Sweep Time to automatic setting mode.

<Program>

STM_OBW AUTO

STM_OBW?

<Response>

AUTO

STM_SMASK

■ Function

Sweep Time: Manual/Auto

Sets either manual or automatic operation for the Sweep Time setting on Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
STM_SMASK *a*	STM_SMASK?	*a*

■ Parameter

Sweep Time setting mode

Value	Mode	Initial value
MAN	Putting Sweeping Time on manual setting mode.	
AUTO	Putting Sweeping Time on automatic setting mode.	*

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- When Sweep Time is changed during Auto, the system compulsorily becomes Manual.
- In the Auto, the value of Sweep Time is automatically set from the value of RBW, VBW and others.

■ Use example

Set the Sweep Time to automatic setting mode.

<Program>

STM_SMASK AUTO

STM_SMASK?

<Response>

AUTO

STRG_ADJ

■ Function

Storage Mode for Adjacent Channel Power
Sets the display method at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_ADJ *mode*	STRG_ADJ?	*mode*

■ Parameter

mode
Display method

Value	Display Method	Initial Value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats a measurement by the number of times specified by Average Count, and displays the average value of the result.	

■ Initialization command

PRE, INI, IP, *RST,

■ Use example

Displays the average value at Adjacent Channel Power measurement.
<Program>
MEAS ADJ,MOD
STRG_ADJ AVG
STRG_ADJ?

<Response>
AVG

STRG_IQL

■ Function

Storage Mode for IQ Level

Sets the display method of the measured results at IQ Level measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_IQL *mode*	STRG_IQL?	*mode*

■ Parameter

mode

Display method

Value	Display Method	Initial Value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats measurement by the number of times specified by Average Count, and displays the average value of the result.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the average value at IQ Level measurement.

<Program>

DSPL IQLVL

STRG_IQL AVG

STRG_IQL?

<Response>

AVG

■ Restrictions according to modal type and options

For MS268x, if Option -17 or -18 is not installed, this command is invalid.

STRG_MOD

■ Function

Storage Mode for Modulation Analysis
Sets the display method of the measured results at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_MOD *mode*	STRG_MOD?	*mode*

■ Parameter

mode
Display method

Value	Display Method	Initial Value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats a measurement by the number of times specified by Average Count, and displays the average value of the result.	
OVER	Overwrite: Overwrites the plotting of measured results in order, and displays the overwritten results at Continuous measurement.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the average value at Modulation Analysis measurement.
<Program>
MEAS MODANAL
STRG_MOD AVG
STRG_MOD?

<Response>
AVG

STRG_OBW

■ Function

Storage Mode for Occupied Bandwidth
Sets the display method of the measured results at Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_OBW *mode*	STRG_OBW?	*mode*

■ Parameter

mode
Display method

Value	Display Method	Initial value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats a measurement by the number of times specified by Average Count, and displays the average value of the result.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the average value at Occupied Bandwidth measurement.
<Program>
MEAS OBW,SPECT
STRG_OBW AVG
STRG _OBW?

<Response>
AVG

STRG_RFPWR

■ Function

Storage Mode for Transmitter Power

Sets the display method of the measured results at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_RFPWR *mode*	STRG_RFPWR?	*mode*

■ Parameter

mode

Display method

Value	Display Method	Initial Value
NRM	Normal: Gives a Ordinary display (single measurement).	*
AVG	Average: Repeats measurement by the number of times specified by Average Count and displays the average value as the result.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the average value at Transmitter Power measurement.

<Program>

MEAS RFPWR,FILTER
STRG_RFPWR AVG
STRG_RFPWR?

<Response>

AVG

STRG_SMASK

■ Function

Storage Mode for Spectrum Emission Mask
Sets the storage mode in the Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_SMASK *a*	STRG_SMASK?	*a*

■ Value of a

Display method

Value	Display method	Initial value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats measurement by the number of times specified by Average Count and displays the average value of the results.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the display method to Average.
<Program>
STRG_SMASK AVG
STRG_SMASK?

<Response>
AVG

STRG_SPU

■ Function

Storage Mode for Spurious Emission
Sets the display method at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
STRG_SPU *mode*	STRG_SPU?	*mode*

■ Parameter

mode
Display Method

Value	Display Method	Initial value
NRM	Normal: Gives a ordinary display (single measurement).	*
AVG	Average: Repeats measurement by the number of times specified by Average Count, and displays the average value of the result.	

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the average value at Spurious Emission measurement.
<Program>
DSPL SPURIOUS,SWEEP
STRG_SPU AVG
STRG _SPU?

<Response>
AVG

SWP

■ Function

Single Measure/Sweep

Executes a measurement and sweeping once.

Unlike the SNGLS command, when the Tx Tester accepts a command during measurement, the command is not processed immediately but is queued until measurement is completed.

Since the command following this SWP command is processed after the current measurement completion, this means that the synchronization between the Tx Tester operation and the program (which sends the command) is ensured.

■ Syntax

Program Message	Query Message	Response Message
SWP	---	---

■ Use example

Executes a measurement and sweeping once.

<Program>

SWP

SWT_ADJ

■ Function

Sweep Time for Adjacent Channel Power

Sets Sweep Time of the Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
SWT_ADJ *a*	SWT_ADJ?	*b*

■ Value of a

Sweep Time

Range	Resolution	Initial Value	Unit
10 to 1000000	1	110 (Measure Method: Spectrum (All)) 125 (Measure Method: Spectrum (Separate))	ms

□ Suffix code

None: ms

S: s

MS: ms

US: μs

■ Value of b

Sweep Time

Resolution	Unit
1	μs

■ Restrictions

- Any value may be input within the set range. However, please see the table below for the actually set value.

Input value	Set Value
10 ms to 1s	Value in 5 ms resolution (rounded up value)
1 to 1000 s	Effective 3 digits (4th digit from top is rounded.)

■ Initialization command

PRE, INI, IP, *RST

■ Use example
Set Sweep Time to 100 ms.
<Program>

```
SWT_ADJ 100MS
SWT_ADJ?
```

<Response>

```
100000
```

SWT_OBW

■ Function

Sweep Time for Occupied Bandwidth

Sets Sweep Time of Occupied Bandwidth measurement using a Spectrum Analyzer.

■ Syntax

Program Message	Query Message	Response Message
SWT_OBW *a*	SWT_OBW?	*b*

■ Value of a

Sweep Time

Range	Resolution	Initial value	Unit
10 to 1000000	1	120	ms

□ Suffix code

None: ms

S: s

MS: ms

US: μs

■ Value of b

Sweep Time

Resolution	Unit
1	μs

■ Restrictions

- Any value may be input within the set range. However, please see the table below for the actually set value.

Input value	Set Value
10 ms to 1s	Value in 5 ms resolution (rounded up value)
1 to 1000 s	Effective 3 digits (4th digit from top is rounded.)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set Sweep Time to 100 ms.

<Program>

SWT_OBW 100MS

SWT_OBW?

<Response>
100000

SWT_SMASK

■ Function

Sweep Time for Spectrum Emission Mask

Sets Sweep Time at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
SWT_SMASK *a*	SWT_SMASK?	*b*

■ Value of a

Sweep Time

Range	Resolution	Initial value	Unit
10 to 1000000	1	120	ms

□ Suffix code

None: ms

S: s

MS: ms

US: μs

■ Value of b

Sweep Time at reading value

Resolution	Unit
1	μs

■ Restrictions

- Any value may be input within the set range. However, please see the table below for the actually set value

Input value	Set Value
10 ms to 1s	Value in 5 ms resolution (rounded up value)
1 to 1000 s	Effective 3 digits (4th digit from top is rounded.)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set Sweep Time to 100 ms.

<Program>

SWT_SMASK 100MS

SWT_SMASK?

<Response>
100000

SYS

■ Function

System Change

Switches the measurement software in the Tx Tester mode.

■ Syntax

Program Message	Query Message	Response Message
SYS *area*	SYS?	*area*

■ Parameter

area

Storage area for measurement software

Value	Storage Area for Measurement Software
1	Area 1 (F1 key)
2	Area 2 (F2 key)
3	Area 3 (F3 key)

■ Use example

Switches to the software stored in Area 1.

<Program>

SYS 1

SYS?

<Response>

1

TAKEWAVE

■ Function

Sets the Refresh Wave Memory on the Demodulation Data screen.

■ Syntax

Program Message	Query Message	Response Message
TAKEWAVE *on_off*	TAKEWAVE?	*on_off*

■ Parameter

on_off

Setting Refresh Wave Memory to On or Off

Value	Setting Refresh Wave Memory to On or Off	Initial Value
ON	Sets Refresh Wave Memory to On.	*
OFF	Sets Refresh Wave Memory to Off.	

■ Restrictions

This setting can not be changed during measurement.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Refresh Wave Memory to Off

<Program>

DSPL DEMOD

TAKEWAVE OFF

TAKEWAVE?

<Response>

OFF

TAKEWAVE_MOD

■ Function

Refresh Wave Memory for Code vs Time
Sets the Refresh Wave Memory when Trace Format is set to Code vs. Time at Modulation Analysis screen. If Refresh Wave Memory is set to "OFF" at the time of Calibration or Adjust Range, Refresh Wave Memory is changed to "ON".

■ Syntax

Program Message	Query Message	Response Message
TAKEWAVE_MOD *on_off*	TAKEWAVE_MOD?	*on_off*

■ Parameter

on_off
Setting Refresh Wave Memory to On or Off

Value	Setting Refresh Wave Memory to On or Off	Initial Value
ON	Sets Refresh Wave Memory to On.	*
OFF	Sets Refresh Wave Memory to Off.	

■ Restrictions

- This setting can not be changed during measurement.
- The setting is unavailable when Storage Mode is set to Average (*cf.* STRG_MOD).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Used example

Sets Refresh Wave Memory to Off.
<Program>
DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
TAKEWAVE_MOD OFF
TAKEWAVE_MOD?

<Response>
OFF

TBLATT_SPU

■ Function

Attenuator for Spurious Emission

Sets attenuator at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
TBLATT_SPU *a,Fb,c*	TBLATT_SPU? *a,Fb*	*c*

■ Value of a

Measurement method selection

Value	Measurement method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Frequency Point

Range	Resolution
1 to 15	1

■ Value of c

Attenuator

Range	RF Input	Resolution	Initial Value	Unit
20 to 82	High Power	2	50	dB
0 to 62	Low Power	2	50	dB

□ Suffix code

None: dB

DB: dB

■ Restrictions

- Attenuator setting range depends on Ref Level (*cf.* RFINPUT,TBLRL_SPU).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the attenuator at frequency point 10 of Spot-method measurement to 20 dB.

<Program>

TBLATTMD_SPU SPOT,AUTO
TBLRL_SPU SPOT,F10,－30DBM
TBLATT_SPU SPOT, F10, 20DB
TBLATT_SPU? SPOT, F10

<Response>

20

TBLATTMD_SPU

■ Function

Attenuator Mode: Manual/Auto for Spurious Emission

Selects manual or automatic attenuator setting of spectrum analyzer on Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
TBLATTMD_SPU *a, b*	TBLATTMD_SPU? *a*	*b*

■ Value of a

Measurement method selection

Value	Measure Method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Attenuator setting mode

Value	Mode	Initial Value
MAN	Sets Attenuator setting mode to manual.	
AUTO	Sets Attenuator setting mode to auto.	*

■ Restrictions

- When attenuator is changed during Auto, the system compulsorily becomes Manual.
- In the Auto, the value of attenuator or Ref-Level is automatically set from.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Setting attenuator of Spot method measurement to Auto mode.

<Program>

TBLATTMD_SPU SPOT, AUTO

TBLATTMD_SPU? SPOT

<Response>

AUTO

TBLATTRLMD_SPU

■ Function

Attenuator Ref Level Mode: Manual/Auto for Spurious Emission
Selects manual of automatic attenuator and Ref-Level setting of spectrum analyzer on Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
TBLATTRLMD_SPU *a, b*	TBLATTRLMD_SPU? *a*	*b*

■ Value of a

Measurement method selection

Value	Measurement Method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Attenuator and Ref-Level setting mode

Value	Mode	Initial Value
MAN	Sets Attenuator and Ref-Level setting modes to manual.	
AUTO	Sets Attenuator and Ref-Level setting modes to auto.	*

■ Restrictions

- When attenuator or Ref-Level is changed during Auto, the system compulsorily becomes Manual.
- When Auto, attenuator or Ref-Level is set automatically.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Setting attenuator or Ref-Level of Spot method measurement to Auto mode.
<Program>
TBLATTRLMD_SPU SPOT, AUTO
TBLATTRLMD_SPU? SPOT

<Response>
AUTO

TBLFREQ_SPU

■ Function

Sets the frequencies for each frequency table on the Setup Spot Table and Setup Search/Sweep Table screens.

When the second argument is set to HRM, frequencies of “n” times (n = 2, 3, 4, …, n) the carrier frequency are set for frequencies f1 thru f15 within the carrier frequency setting range.

■ Syntax

Program Message	Query Message	Response Message
TBLFREQ_SPU *mode, Ftable_no, freq*	TBLFREQ_SPU? *mode, Ftable_no*	*freq*
TBLFREQ_SPU *mode*, HRM		

■ Parameter

mode

Type of frequency to be set

Value	Type of Frequency to be set
SPOT	Measurement frequency in Spot Mode
START	Sweep-start frequency in Sweep/Search Mode
STOP	Sweep-stop frequency in Sweep/Search Mode

table_no

Frequency table number

Range	Resolution
1 to 15	1

freq

Frequency

Range	Value of mode	Resolution	Unit
100 to 7900000000	SPOT	1	Hz
1000 to 7899999000	START	1	Hz
2000 to 7900000000	STOP	1	Hz
0	SPOT, START, STOP	---	---

- When 0 is set the value set in the frequency table is deleted.

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GZ: GHz

■ Initialization command

*RST

■ Use example

Sets the frequency for Frequency Spot Table 4 to 1,850 MHz.

<Program>

DSPL SETTBL_SPU,SPOT

TBLFREQ_SPU SPOT,F4,1850MHZ

TBLFREQ_SPU? F4

<Response>

1850000000

■ Initial value

Refer to the following table for initial value of Parameter.

"---" expresses un-setting stage.

When Spurious Mode is set to Spot:

	Frequency	RBW	VBW	SWT	Limit
f1	3840.000000 MHz	1 MHz	1 MHz	10 ms	0.00 dBm
f2	5760.000000 MHz	1 MHz	1 MHz	10 ms	0.00 dBm
f3	7680.000000 MHz	1 MHz	1 MHz	10 ms	0.00 dBm
f4	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f5	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f6	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f7	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f8	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f9	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f10	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f11	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f12	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f13	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f14	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f15	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm

When Spurious is set to Search or Sweep

	Start Frequency	Stop Frequency	RBW	VBW	SWT	Limit
f1	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f2	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f3	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f4	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f5	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f6	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f7	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f8	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f9	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f10	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f11	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f12	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f13	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f14	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm
f15	----.------ MHz	----.------ MHz	--- MHz	--- MHz	--- ms	---.-- dBm

TBLRBW_SPU

■ Function

Sets the RBW for each frequency table on the Setup Spot Table and Setup Search/Sweep Table screens.

■ Syntax

Program Message	Query Message	Response Message
TBLRBW_SPU *table,Ftable_no,freq*	TBLRBW_SPU? *table,Ftable_no*	*freq*

■ Parameter

table

Frequency Table to be set

Value	Frequency Table to be Set
SPOT	Spot
SWEEP	Sweep/Search

table_no

Frequency table number

Range	Resolution
1 to 15	1

freq

RBW

Resolution	Unit
300	Hz
1000	
3000	
10000	
30000	
100000	
300000	
1000000	
3000000	
5000000	
10000000	
20000000	

☐ Suffix code

None: Hz
HZ: Hz
KHZ, KZ: kHz
MHZ, MZ: MHz
GHZ, GH: GHz

■ Initialization command

*RST

■ Use example

Sets the RBW for Frequency Spot Table 4 to 30 kHz.

<Program>

```
DSPL SETTBL_SPU,SPOT
TBLRBW_SPU SPOT,F4,30KHZ
TBLRBW_SPU? F4
```

<Response>

```
30000
```

TBLRBWMD_SPU

■ Function

RBW: Manual/Auto for Spurious Emission

Sets either the manual or automatic operation of the RBW setting of the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
TBLRBWMD_SPU *a, b*	TBLRBWMD_SPU? *a*	*b*

■ Value of a

Selection of measurement method

Value	Measurement method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

RBW setting mode

Value	Mode	Initial Value
MAN	Sets RBW to manual setting mode.	
AUTO	Sets RBW to automatic setting mode.	*

■ Restrictions

- When RBW is changed during Auto, the system compulsorily goes to Manual.
- In the Auto, the value of RBW is automatically set from the frequency value, as shown in the table below.

Frequency	RBW
9 kHz ≤ f < 150 kHz	1 kHz
150 kHz ≤ f < 30 MHz	10 kHz
30 MHz ≤ f < 1 GHz	100 kHz
1 GHz ≤ f	1 MHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set RBW of Spot method measurement to automatic setting mode.

<Program>

TBLRBWMD_SPU SPOT, AUTO

TBLRBWMD_SPU? SPOT

<Response>

AUTO

TBLRBWTP_SPU

■ Function

RBW Mode: Digital/Normal for Spurious Emission

Sets RBW mode to digital filter sweeping mode or normal at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
TBLRBWTP_SPU *a, b*	TBLRBWTP_SPU? *a*	*b*

■ Value of a

Selection of measurement method

Value	Measurement Method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Sweeping mode

Value	Mode	Initial Value
DGTL	Sets to digital filter Sweeping mode (Digital).	
NRM	Sets to ordinary Sweeping Mode (Normal).	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Setting Sweep method measurement to digital filter Sweeping mode.

<Program>

TBLRBWTP_SPU SWEEP,DGTL

TBLRBWTP_SPU? SWEEP

<Response>

DGTL

■ Note

This function is an option.

TBLRL_SPU

■ Function

Ref Level for Spurious Emission

Sets the Reference Level at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
TBLRL_SPU *a,Fb,c*	TBLRL_SPU? *a,Fb*	*c*

■ Value of a

Selection of measure method

Value	Measurement Method
SPOT	The sweeping mode of Spot method is measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method is measurement is subjected.

■ Value of b

Frequency point

Range	Resolution
1 to 15	1

■ Value of c

Ref Level

Range	Resolution	Initial Value	Unit
Refer to Restrictions.	0.01	50.00	dBm

□ Suffix code

None: dBm

DBM: dBm

■ Restrictions

- Refer to the following table for the setup range of Reference Level by RF Input: High/Low (cf. RFINPUT) and Pre Ampl: On/Off (cf. PRAMP)
- Refer to REFLVLOFS for RefLevelOffset.

		RF Input	
		High	Low
Attenuator Mode: Auto	Pre Ampl: Off	(−100.00+RefLevelOffset) to (50.00+RefLevelOffset)	(−120.00+RefLevelOffset) to (40.00+RefLevelOffset)
	Pre Ampl: On	(−100.00+RefLevelOffset) to (30.00+RefLevelOffset)	(−140.00+RefLevelOffset) to (20.00+RefLevelOffset)

- If the reference level will become of range due to RF Input or Pre Ampl change, the level is rounded to the nearest value within the range.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Ref Level of Spot method measurement to −30.0 dBm.

<Program>

TBLATTMD_SPU SPOT,AUTO

TBLRL_SPU SPOT,F10,−30DBM

TBLRL_SPU? SPOT,F10

<Response>

−30.00

TBLSTD

■ Function

Select Standard Frequency Table for Spurious Emission

Sets the standard for the frequency table during spurious measurement.

■ Syntax

Program Message	Query Message	Response Message
TBLSTD *a*	---	---

■ Value of a

Selecting standard

Value	Selected standards	Initial Value
0	BS TELEC (Category A)	*
1	BS Category B	
2	MS TELEC	
3	BS Protection of the BS receiver	
4	BS Co-exitance with GBM 900	
5	BS Co-exitance with DCB 1800	
6	BS Co-exitance with PHS	
7	MS Additional	

■ Setting value for BS TELEC (Category A)

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
9 to 150 kHz	−13 dBm	1 kHz	1 kHz	(Note 1)	ATT −20 dBm
150 kHz to 30 MHz		10 kHz	10 kHz	(Note 1)	ATT −20 dBm
30 MHz to 1 GHz		100 kHz	100 kHz	(Note 1)	ATT −20 dBm
1 to 12.75 GHz		1 MHz	1 MHz	(Note 1)	ATT −30 dBm

■ Setting value for BS Category B

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)	Remarks
9 to 150 kHz	−36 dBm	1 kHz	1 kHz	(Note 1)	ATT −20 dBm	
150 kHz to 30 MHz		10 kHz	10 kHz	(Note 1)	ATT −20 dBm	
30 MHz to 1 GHz		100 kHz	100 kHz	(Note 1)	ATT −20 dBm	
1 GHz to Fw	−30 dBm	1 MHz	1 MHz	(Note 1)	ATT −30 dBm	Fw: Higher one of either (Fc1 −60 MHz) or 2100 MHz Fx: Higher one of either (Fc1 −50 MHz) or 2100 MHz Fy: Lower one of either (Fc2 + 50 MHz) or 2180 MHz Fz: Lower one of either (Fc2 + 60 MHz) or 2180 MHz Fc1: Center frequency of first carrier frequency used Fc2: Center frequency of last carrier frequency used
Fw to Fx	−25 dBm					
Fx to Fy	−15 dBm					
Fy to Fz	−25 dBm					
Fz to 12.75 GHz	−30 dBm					

■ Setting value for MS TELEC

Frequency	Minimum requirements	RBW	VBW	ATT	Reference Level (Note 2)
9 to 150 kHz	−13 dBm	1 kHz	1 kHz	(Note 1)	ATT −20 dBm
150 kHz to 30 MHz		10 kHz	10 kHz	(Note 1)	ATT −20 dBm
30 MHz to 1 GHz		100 kHz	100 kHz	(Note 1)	ATT −20 dBm
1000 to 1893.5 MHz	−30 dBm	1 MHz	1 MHz	(Note 1)	ATT −30 dBm
1893.5 to 1919.6 MHz	−41 dBm	300 kHz	300 kHz	2 dB	−18 dBm
1919.6 MHz to12.75 GHz	−30 dBm	1MHz	1MHz	(Note 1)	ATT −30 dBm

■ Setting value for BS Protection of the BS receiver

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
1920 to 1980 MHz	−96 dBm	100 kHz	100 kHz	(Note 1)	ATT −20 dBm
1850 to 1910 MHz					

■ Setting value for BS Co-exitance with PHS

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
1893.5 to 1919.6 MHz	−41 dBm	300 kHz	300 kHz	2 dB	−18 dBm

■ Setting value for BS Co-exitance with GSM 900

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
921 to 960 MHz	−57 dBm	100 kHz	100 kHz	2 dB	−18 dBm

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
876 to 915 MHz	−98 dBm	100 kHz	100 kHz	(Note 1)	ATT −20 dBm

■ Setting value for BS Co-exitance with DCS 1800

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
1805 to 1880 MHz	−47 dBm	100 kHz	100 kHz	(Note 1)	ATT −20 dBm

Frequency	Limit	RBW	VBW	ATT	Reference Level (Note 2)
1710 to 1785 MHz	−98 dBm	100 kHz	100 kHz	(Note 1)	ATT −20 dBm

■ Setting value for MS Additional

<table>
<tr><th>Frequency</th><th>Limit</th><th>RBW</th><th>VBW</th><th>ATT</th><th>Reference Level (Note 2)</th></tr>
<tr><td>1893.5 to 1919.6 MHz</td><td>−41 dBm</td><td>300 kHz</td><td>300 kHz</td><td>2 dB</td><td>−18 dBm</td></tr>
<tr><td>925 to 935 MHz</td><td>−67 dBm</td><td rowspan="3">100 kHz</td><td rowspan="3">100 kHz</td><td rowspan="3">(Note 1)</td><td rowspan="3">ATT −20 dBm</td></tr>
<tr><td>935 to 960 MHz</td><td>−79 dBm</td></tr>
<tr><td>1805 to 1880 MHz</td><td>−71 dBm</td></tr>
</table>

Note 1: ATT is set to according to Reference Level of the system software.

Note 2: When using preamplifier, these values become lower by 20 dB.

■ Restrictions

- BS TELEC (Category A), BS Category B and MS TELEC are set exclusively. Other items are added to the set table.

■ Initialization command

None

■ Use example

To set BS TELEC (Category A) and BS Co-exitance with PHS.

<Program>

```
DSPL SETTBL_SPU,SWEEP
TBLSTD 6
```

TBLSWT_SPU

■ Function

Sweep Time for Spurious Emission

Sets Sweep Time of the Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
TBLSWT_SPU *a,Fb,c*	TBLSWT_SPU? *a,Fb*	*c*

■ Value of a

Selection of measurement method

Value	Measurement method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Frequency Points

Range	Resolution
1 to 15	1

■ Value of c

Sweep time

Resolution	Unit
1	μ s

□ Suffix code

None: ms

S : s

MS: ms

US: μs

■ Restrictions

- Any value may be input within the setting range. However, refer to the table below for the actually set values. Refer to the initial value column of TBLFREQ_SPU for the initial value

Input Value	Set Value
10 ms to 1 s	Value in 5 ms resolution (rounded up value)
1 to 1000 s	Effective 3 digits (4th digit from top is rounded.)

■ Initialization command

PRE, INI, IP , ∗RST

■ Use example

Setting f3 Sweep Time of Search method measurement to 100 msec.

<Program>

TBLSWT_SPU SWEEP,F3,100MS

TBLSWT_SPU? SWEEP,F3

<Response>

100000

TBLSWTMD_SPU

■ Function

Sweep Time: Manual/Auto for Spurious Emission
Sets either the manual or automatic operation of Sweep Time setting on the Spurious Emission Screen.

■ Syntax

Program Message	Query Message	Response Message
TBLSWTMD_SPU *a,b*	TBLSWTMD_SPU? *a*	*b*

■ Value of a

Selection of measurement method

Value	Measurement method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Sweep Time setting mode

Value	Mode	Initiali Value
MAN	Sets Sweep Time to Manual setting mode.	
AUTO	Sets Sweep Time to Automatic setting mode.	*

■ Restrictions

- When Sweep Time is changed during Auto, the system compulsorily becomes Manual.

Minimum value and setting resolution in RBW Mode: Digital

For 501 Data Points				For 1001 Data Points		
RBW	Sweep Time (in ms unit)			RBW	Sweep Time (in ms unit)	
	Minimum Value	Setting resolution			Minimum Value	Setting resolution
10 Hz	50	50		10 Hz	100	100
30 Hz	50	50		30 Hz	100	100
100 Hz	50	50		100 Hz	100	100
300 Hz	10	10		300 Hz	20	20
1 kHz	10	10		1 kHz	20	20
3 kHz	10	5		3 kHz	10	10
10 kHz	10	5		10 kHz	10	5
30 kHz	10	5		30 kHz	10	5
100 kHz	10	5		100 kHz	10	5
300 kHz	10	5		300 kHz	10	5
1 MHz	10	5		1 MHz	10	5

■ Initialization value

PRE, INI, IP, *RST
Note1: When RBW Mode is Digital, Added to minimum value of a in a table below.

■ Use example

Sets Sweep Time of Spot method measurement to Manual setting mode.

<Program>

TBLSWTMD_SPU SPOT,MAN

TBLSWTMD_SPU? SPOT

<Response>

MAN

TBLVBW_SPU

■ Function

VBW for Spurious Emission
Sets the VBW of Spurious Emission measurement

■ Syntax

Program Message	Query Message	Response Message
TBLVBW_SPU *a,Fb,c*	TBLVBW_SPU? *a,Fb*	*c*

■ Value of a

Value	Measurement method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Frequency point

Range	Resolution
1 to 15	1

■ Value of c

VBW

Range	Resolution	Initial Value	Unit
0, 1, 3, 10, 30, 100, 300, 1000, 3000, 10000, 30000, 100000, 300000, 1000000, 3000000,	1	Refer to TBLFREQ_SPU initial Value column.	Hz

□ Suffix code

None: Hz
HZ: Hz
KHZ, KH: kHz
MHZ, MH: MHz
GHZ, GH: GHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set f2 VBW of Search method measurement to 30 kHz
<Program>
TBLVBW_SPU SWEEP,F2,30KHZ
TBLVBW_SPU? SWEEP,F2

<Response>
30000

TBLVBWMD_SPU

■ Function

VBW: Manual/Auto for Spurious Emission

Sets manual or automatic setting for VBW setting on the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
TBLVBWMD_SPU *a, b*	TBLVBWMD_SPU? *a*	*b*

■ Value of a

Selection of measurement method

Value	Measurement Method
SPOT	The VBW used in Spot method measurement is subjected.
SWEEP	The VBW used in Search or Sweep method measurement is subject.

■ Value of b

VBW setting mode

Value	Mode	Initial Value
MAN	Sets VBW to manual setting mode.	
AUTO	Sets VBW to automatic setting mode.	*

■ Restrictions

- When VBW is changed during Auto, the system compulsorily changes to Manual.
- In the Auto, VBW value is set automatically from the RBW value and the VBW/RBW Ratio value.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set VBW of Spot method measurement to automatic setting mode.

<Program>

TBLVBWMD_SPU SPOT, AUTO

TBLVBWMD_SPU? SPOT

<Response>

AUTO

TBLVBWRT_SPU

■ Function

VBW/RBW Ratio for Spurious Emission

Sets VBW and RBW ratio used in VBW automatic setting on the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
TBLVBWRT_SPU *a, b*	TBLVBWRT_SPU? *a*	*b*

■ Value of a

Selection of measurement method

Value	Measurement Method
SPOT	VBW of Spot method measurement is subjected.
SWEEP	VBW of Search or Sweep method measurement is subject.

■ Value of b

VBW/RBW Ratio

Range	Resolution	Initial Value
0.0001 to 100	0.0001	1

■ Restrictions

- Any value may be input within setting range. However, actually set values are as shown in Table below.

Setting value												
0.0001	0.0003	0.001	0.003	0.01	0.03	0.1	0.3	1	3	10	30	100

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets the Search method measurement VBW/RBW Ratio to 3.

<Program>

TBLVBWRT_SPU SWEEP, 3

TBLVBWRT_SPU? SWEEP

<Response>

3

TBLVIEW_SPU

■ Function

View for Setup Spot Table or Search/Sweep Table

On the Setup Search/Sweep Table screen, selects whether to display RBW/VBW/SWT, Ref-Level/ATT, or Limit on the right side of the screen.

■ Syntax

Program Message	Query Message	Response Message
TBLVIEW_SPU *a,b*	TBLVIEW_SPU? *a*	*b*

■ Value of a

Selection of Measure Method

Value	Measurement Method
SPOT	The sweeping mode of Spot method measurement is subjected.
SWEEP	The sweeping mode of Search/Sweep method measurement is subjected.

■ Value of b

Display items

Value	Display items	Initial Value
BWSWT	Displays RBW, VBW, and SWT.	*
REFATT	Displays Ref Level and ATT.	
LMT	Displays Limit.	

- When no value of b is specified, Change value in order of BWSWT, REFATT and LMT.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays Limit.

<Program>

DSPL SETTBL_SPU, SWEEP

TBLVIEW_SPU SWEEP,LMT

TBLVIEW_SPU? SWEEP

<Response>

LMT

TEMPLVL_SMASK

■ Function

Setup Template Level for Spectrum Emission Mask
Sets the level for the template offset frequency in the Setup Template screen during Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
TEMPLVL_SMASK *a,b*	TEMPLVL_SMASK? *a*	*b*

■ Value of a

Value		Offset frequency
Up Link	1	2.5 MHz
	2	3.5 MHz
	3	7.5 MHz
	4	8.5 MHz
Down Link	1	2.515 MHz
	2	3.515 MHz
	3	4.0 MHz
	4	8.0 MHz

■ Value of b

Range	Resolution	Unit
−100.0 to 0	0.1	dB (Up Link)
		dBm (Down Link)

□ Suffix code

None : dB
DB : dB
DBM : dBm

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets offset frequency level for Spectrum Emission Mask measurement.
<Program>
DSPL SETTEMP_SMASK
TEMPLVL_SMASK 1,10.0
TEMPLVL_SMASK? 1

<Response>
10.0

TEMPPASS_SMASK

■ Function

Template Pass/Fail Judgment for Spectrum Emission Mask

Reads the pass/fail judgment result for a waveform using the template in the Spectrum Emission Mask screen. Judgment criteria: Pass when the waveform is within template at all point. Fail when any point on the waveform exceeds the template.

■ Syntax

Program Message	Query Message	Response Message
---	TEMPPASS_SMASK?	*a*

■ Value of a

Judgment result

Value	Judgment Result
PASS	Pass: Passed
FAIL	Fail: Failed

■ Use example

Reads the judgment result of a measurement waveform during Spectrum Emission Mask measurement.

<Program>

DSPL ACP

SWP

TEMPPASS_SMASK?

<Response>

PASS

TEMPPWR_SMASK

■ Function

Setup Template Power for Spectrum Emission Mask

Sets the power value when the template is set to Down Link (39<=P<43 dBm) or Down Link (31<=P<39 dBm) on Setup Template screen at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
TEMPPWR_SMASK *a*	TEMPPWR_SMASK?	*a*

■ Value of a

Range	Resolution	Unit
−100.0 to 100.0	0.1	dBm

□ Suffix code

None : dBm

DBM : dBm

■ Restrictions

- The select template must be set to the Down Link (39<=P<43 dBm) or Down Link (31<=P<39 dBm). (*cf.* TEMPTYPE_SMASK)

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the power value at Spectrum Emission Mask measurement.

<Program>

DSPL SETTEMP_SMASK

TEMPTYPE_SMASK DNLNK2

TEMPPWR_SMASK 10.0

TEMPPWR_SMASK?

<Response>

10.0

TEMPTYPE_SMASK

■ Function

Select Template Type for Spectrum Emission Mask
Sets the template type for the standards in the Setup Template screen during Spectrum Emission Mask measurement. Set the template by using the SLCTTEMP_SMASK command.

■ Syntax

Program Message	Query Message	Response Message
TEMPTYPE_SMASK *a*	TEMPTYPE_SMASK?	*a*

■ Value of a

Value	Standards	Initial value
UPLNK	Up Link template value of 3GPP standards.	*
DNLNK	Down Link (P<31 dBm) template value of 3GPP standards.	
DNLNK1	Down Link (P>=43 dBm) template value of 3GPP standards.	
DNLNK2	Down Link (39<=P<43 dBm) template value of 3GPP standards.	
DNLNK3	Down Link (31<=P<39 dBm) template value of 3GPP standards.	

■ Initialization value

PRE, INI, IP, *RST

■ Use example

Sets the Up Link template.
<Program>
DSPL SETTEMP
TEMPTYPE_SMASK UPLNK
SLCTTMP_SMASK STD
TEMPTYPE_SMASK?
SLCTTEMP_SMASK?

<Response>
UPLNK
STD

■ Setting value of Up Link

Frequency Offset	Limit	RBW	VBW	ATT	Reference Level (note 2)
2.5 to 3.5 MHz	−35−15(f_offset−2.5) dBc	30 kHz	30 kHz	(note 1)	ATT −10 dBm
3.5 to 7.5 MHz	−35−1(f_offset−3.5) dBc	1 MHz	1 MHz	(note 1)	ATT −10 dBm
7.5 to 8.5 MHz	−39−10(f_offset−7.5) dBc	1 MHz	1 MHz	(note 1)	ATT −10 dBm
8.5 to 12.5 MHz	−49 dBc	1 MHz	1 MHz	(note 1)	ATT −10 dBm

■ Setting value of Down Link (P>=43 dBm)

Frequency Offset	Limit	RBW	VBW	ATT	Reference Level (note 2)
2.515 to 2.715 MHz	−14 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
2.715 to 3.515 MHz	−14−15(f_offset−2.715) dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
3.515 to 4 MHz	−26 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
4 to 8 MHz	−13 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm
8 to 12.5 MHz	−13 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm

■ Setting value of Down Link (39<=P<43 dBm)

Frequency Offset	Limit	RBW	VBW	ATT	Reference Level (note 2)
2.515 to 2.715 MHz	−14 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
2.715 to 3.515 MHz	−14−15(f_offset−2.715) dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
3.515 to 4 MHz	−24.5 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
4 to 8 MHz	−13 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm
8 to 12.5 MHz	P−56 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm

■ Setting value of Down Link (31<=P<39 dBm)

Frequency Offset	Limit	RBW	VBW	ATT	Reference Level (note 2)
2.515 to 2.715 MHz	P−53 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
2.715 to 3.515 MHz	P−53−15(f_offset−2.715) dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
3.515 to 4 MHz	P−65 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
4 to 8 MHz	P−52 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm
8 to 12.5 MHz	P−56 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm

■ Setting value of Down Link (P<31 dBm)

Frequency Offset	Limit	RBW	VBW	ATT	Reference Level (note 2)
2.515 to 2.715 MHz	−22 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
2.715 to 3.515 MHz	−22−15(f_offset−2.715) dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
3.515 to 4 MHz	−34 dBm	30 kHz	30 kHz	(note 1)	ATT −10 dBm
4 to 8 MHz	−21 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm
8 to 12.5 MHz	−25 dBm	1 MHz	1 MHz	(note 1)	ATT −10 dBm

note1: ATT is set up according to Reference Level of system software.

note2: Value becomes 20 dB low When preamplifier is used.

TERM

■ Function

Sets the connector for the input signal to be measured.

■ Syntax

Program Message	Query Message	Response Message
TERM *terminal*	TERM?	*terminal*

■ Parameter

terminal

Connector for the input signal to be measured

Value	Connector for the Input Signal to be Measured	Initial Value
RF	Sets the input signal connector to RF.	*
IQDC	Sets the input signal connector to IQ-DC.	
IQAC	Sets the input signal connector to IQ-AC.	
IQBAL	Sets the input signal connector to IQ-Balance.	

■ Restrictions

- The displayed measurement screen must be set to the Setup Common Parameter screen. (*cf.* DSPL)

■ Initialization command

*RST

■ Use example

Sets the input signal connector to IQ-DC.

<Program>

```
DSPL SETCOM
TERM IQDC
TERM?
```

<Response>

```
IQDC
```

■ Restrictions due to options and equipment

For MS268x, IQ input is Option

- Following restrictions are applied depending on validity/invalidity of IQ Balance and IQ Unbalance options.
  - When IQ Balance option is valid, all items can be selected regardless of validity/invalidity of IQ Unbalance option
  - When IQ Unbalance option is valid, IQ Balance cannot be selected
  - When both IQ Balance and IQ Unbalance options are invalid, no items except RF can be selected.
  - For MS2687A/B, IQ-Balance can not be installed.

THRESHMD_MOD

■ Function

Threshold Mode for Modulation Analysis
Sets method of identifying the active channels to either the method of identifying automatically or the method of using the threshold value.

■ Syntax

Program Message	Query Message	Response Message
THRESHMD_MOD *a*	THRESHMD_MOD?	*a*

■ Value of a

method of identifying

Value	method of identifying	Initial Value
AUTO	Sets the method of identifying the active channels automatically.	*
MANUAL	Sets the method of identifying the active channels by the threshold value.	

■ Restrictions

- When Auto Rate Detection is set to Off, this command is unavailable since it is identified by the user-defined threshold value (*cf.* AUTODET).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Threshold Mode to Auto.
<Program>
THRESHMD_MOD AUTO
THRESHMD_MOD?

<Response>
AUTO

THRESH_MOD

■ Function

Threshold Level for Modulation Analysis

Sets Threshold Level judges active channel at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
THRESH_MOD *a*	THRESH_MOD?	*a*

■ Value of a

Threshold level

Range	Resolution	Unit	Initial Value
−50.0 to −10.0	0.1	dB	−30.0

■ Restrictions

- This command is unavailable when Auto Rate Detection and Threshold Mode are set to On and Auto respectively (*cf.* THRESHMD_MOD, AUTODET).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets threshold level to −20.0 dB

<Program>

THRESHMD_MOD MANUAL

THRESH_MOD −20.0

THRESH_MOD?

<Response>

−20.0

TIMINGOFS

■ Function

Timing Offset

Outputs the measured result for timing offset (difference between the reference time and the frame start point) on the Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
---	TIMINGOFS? *a*	*b*

■ Value of a

Timing Offset value

Value	Unit
None	Outputs the result in both time(μs) and chip units.
TIME	Outputs the result in time(μs).
CHIP	Outputs the result in chip unit.

■ Value of b

Timing Offset value

Resolution	Unit
0.01	μs
0.01	chip

■ Use example

Reads the result of Timing Offset measurement.

<Program>

DSPL MODANAL

TIMINGOFS? TIME

<Response>

1.00

TIMINGOFS_DEMOD

■ Function

Timing Offset for Demodulation Data.
Sets demodulation timing offset by chip unit at Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
TIMINGOFS_DEMOD *chip*	TIMINGOFS_DEMOD?	*chip*

■ Parameter

chip

Timing Offset Chip

Range	Resolution	Initial Value	Unit
0 to 150	1	0	x256T chip

■ Restrictions

- This setting is possible when Measuring Object is set to Down Link or Down Link (Compressed). (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Timing Offset to 1 x256T chip.

<Program>
DSPL DEMOD
SWP
TIMINGOFS_DEMOD 1
TIMINGOFS_DEMOD?

<Response>
1

TIMINGPM

■ Function

Timing Offset between Preamble RACH and Message Part

Outputs Timing Offset between Preamble RACH and RACH and Message Part at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
---	TIMINGPM?	*a*

■ Value of a

Timing offset between Preamble RACH and Message Part

Resolution	Unit
0.01	chip

■ Resolutions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out measurement result of Timing Offset.

<Program>

DSPL RFPWR,RACH

TIMINGPM?

<Response>

15360.00

TIMINGTP

■ Function

Timing Offset between Trigger and Preamble RACH

Outputs Timing Offset between Trigger and Preamble RACH at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
---	TIMINGTP?	*a*

■ Value of a

Timing offset between Trigger and Preamble RACH

Resolution	Range
0.01	chip

■ Resolution

- This command can be used only when the using measurement system is MX8601x01B/MX268x01B.

■ Use example

Reads out measurement result of Timing Offset.

<Program>

DSPL RFPWR,RACH

TIMINGTP?

<Response>

152.00

TOTALPASS

■ Function

Compares the measurement results with the reference value for each slot, and outputs the judgment results at Transmitter Power measurement.
Return “Pass” only when all the measured results are within the allowable range for all the slots.

■ Syntax

Program Message	Query Message	Response Message
---	TOTALPASS?	*judge*

■ Parameter

judge
Judgment result

Value	Judgment Result
PASS	Pass
FAIL	Fail

■ Use example

Reads out the judgment result of TPC specification.
<Program>
DSPL RFPWR,TPC
SWP
TOTALPASS?

<Response>
FAIL

TOTALPREAM

■ Function

Outputs Total Preamble when Measure Method is set to RACH at Transmitter Power measurement.

■ Syntax

Program Message	Query Message	Response Message
---	TOTALRREAM?	*n*

■ Parameter

Value of n

Total Preamble

Value	Resolution
0 to 16	1

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out total preamble.

<Program>

DSPL RFPWR,RACH

SWP

TOTALPREAM?

<Response>

3

TOTALSGNL

■ Function

Total Active Channel Number

Reads out number of Active Channel for Code Domain at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	TOTALSGNL?	*n*

■ Parameter

n

Total Active Channel

Resolution	Unit
1	None

■ Restrictions

- This setting is possible when Auto Rate Detection is set to ON. (*cf.* AUTODET)
- This setting is possible when Measuring Object is set to other than UP Link (RACH), QPSK. (*cf.* MEASOBJ)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out number of Active Channels for Code Domain.

<Program>

DSPL MODANAL

SWP

TOTALSGNL?

<Response>

26

TPC

■ Function

Individually sets Slots 2 thru Analysis Slot at Setup TPC screen.

■ Syntax

Program Message	Query Message	Response Message
TPC *slot,up_down,step*	TPC? *slot*	*up_down,step*

■ Parameter

slot

Slot number

Value	Slot	Resolution
2 to Analysis Slot	Slot 2 to Analysis Slot	1

Analysis Slot is changed by set value of SLTLEN_RFPWR.

up_down

Up/Down setting of the power to each slot

Value	Up/Down Setting	Initial Value
UP	Sets the TPC for the slot specified by “slot” to Up.	*
DN	Sets the TPC for the slot specified by “slot” to Down.	
NO	Sets the TPC for the slot specified by “slot” to 0	

Up/Down means +1, +2, +3 or −1, −2, −3 by “step” setting respectively.

step

Step size

Value	Step size	Unit
None	Sets 1 dB.	
1, 2, 3	Sets setup Step Size.	dB

■ Initialization

PRE, INI, IP, *RST

■ Use example

Decrease the power for Slot 2.

<Program>

DSPL SETTPC

TPC 2,DN

TPC? 2

<Response>

DN

TPCPASS

■ Function

Compares the measured results with the set value for each or all the slots, and outputs Pass or Fail judgment result at TPC measurement.

■ Syntax

Program Message	Query Message	Response Message
---	TPCPASS? *slot*	*relpwr,abspwr*
---	TPCPASS? *slot*,REL	*relpwr*
---	TPCPASS? *slot*,ABS	*abspwr*
---	TPCPASS? ALL	*relpwr1,abspwr1,…,relpwrN,abspwrN…,relpwr15,abspwr15*
---	TPCPASS? ALL,REL	*relpwr1,…,relpwrN,…,relpwr15*
---	TPCPASS? ALLABS	*abspwr1,…,abspwrN,…,abspwr15*

■ Parameter

slot

Slot number

Value	Slot	Resolution
1 to 15	Slot 1 to 15	1

relpwr, relpwrN

Judgment of the specified relative power value (for "*N*"-th slot)

Value	Judgment of Relative Power Value
PASS	Pass
FAIL	Fail
OFF	The judgment function is set to Off. (cf. JALLTPC)

abspwr, abspwrN

Judgment of the specified absolute power value (for the "*N*"-th slot)

Value	Judgment of Absolute Power Value
PASS	Pass
FAIL	Fail
OFF	The judgment function is set to Off. (cf. JALLTPC)

■ Use example

Reads out judgment of the relative power value for Slot 3.

<Program>

DSPL RFPWR,TPC

SWP

TPCPASS? 3, REL

<Response>
PASS

TRFORM

■ Function

Sets the waveform display format at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
TRFORM *form*	TRFORM?	*form*

■ Parameter

form

Waveform format

Value	Waveform format	Initial value
NON	None: Displays the numeric results only. Does not display a waveform.	*
CONSTEL	Constellation: Displays IQ diagram.	
EYE	Eye Diagram: Displays change in the IQ signals via the elapse of time.	
VECT	EVM: Displays EVM.	
PHASE	Phase Error: Displays the phase error.	
MAGTD	Magnitude: Displays the amplitude error	
CODE	Code Domain: Displays the code domain at Up-Link and Down-Link and Down-Link (Compress)	
CDVSTM	Code vs Time: Displays the code vs. time at Up-Link and Down-Link and Down Link (Compress).	

■ Restrictions

- Setting Code Domain and Setting Code vs. Time are not possible when Measuring Object to set to QPSK (*cf.* MEASOBJ).
- CDVSTM can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the waveform display format to Phase Error.

<Program>

MEAS MODANAL

TRFORM PHASE

TRFORM?

<Response>

PHASE

TRFORM_CCDF

■ Function

Trace Format for CCDF

Sets Trace Format at CCDF screen.

■ Syntax

Program Message	Query Message	Response Message
TRFORM_CCDF *form*	TRFORM_CCDF?	*form*

■ Parameter

form

Wave format

Value	Wave format	Initial value
POS	Displays Power Distribution over Average Power.	
NEG	Displays Power Distribution under Average Power.	
POSNEG	Displays total Power Distribution.	*

■ Restrictions

- This setting is possible only when Measure Method is set to APD (*cf.* DSPL).
- This setting can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Trace Format to Positive & Negative.

<Program>

DSPL CCDF,APD

TRFORM_CCDF POSNEG

TRFORM_CCDF?

<Response>

POSENG

TRG

■ Function

Trigger

Specifies whether to start the measurement using internal timing or external trigger.

■ Syntax

Program Message	Query Message	Response Message
TRG *trg*	TRG?	*trg*

■ Parameter

trg

Trigger setting

Value	Trigger Setting	Initial value
FREE	Free Run: Starts a measurement using internal timing.	*
WIDEVID	Wide IF: Starts a measurement using Wide IF Video trigger.	
EXT	External: Starts a measurement using external trigger.	

■ Restrictions

- This setting is not possible when Measurement Screen is set to Power Meter or Spurious Emission (*cf.* DSPL).
- WIDEVID can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

*RST

■ Use example

Starts a measurement using external trigger.

<Program>

DSPL SETCOM

TRG EXT

TRG?

<Response>

EXT

TRGDLY

■ Function

Trigger Delay

Sets the time delay from the trigger input to the actual timing execution.

■ Syntax

Program Message	Query Message	Response Message
TRGDLY *chip*	TRGDLY?	*chip*

■ Parameter

chip

Trigger delay value

Range	Resolution	Initial Value	Unit
−384000.0 to 384000.0	0.2	0.0	chip

■ Restrictions

- This setting is not possible when the displayed measurement screen is the Power Meter or Spurious Emission screen. (*cf.* DSPL)
- Trigger delay setting is not possible when Trigger is set to Free Run (*cf.* TRG).

■ Initialization command

∗RST

■ Use example

Sets the Trigger Delay value to 50.0 chip.

<Program>

DSPL SETCOM

TRG EXT

TRGDLY 50.0

TRGDLY?

<Response>

50.0

TRGEDGE

■ Function

Trigger Edge

Sets the trigger-signal rise or fall slope as the trigger timing reference.

■ Syntax

Program Message	Query Message	Response Message
TRGEDGE *timing*	TRGEDGE?	*timing*

■ Parameter

timing

Trigger reference

Value	Trigger Reference	Initial value
RISE	Sets trigger-signal rise slope as the trigger reference.	*
FALL	Sets trigger-signal fall slope as the trigger reference.	

■ Restrictions

- This setting is not possible when the displayed measurement screen is the Power Meter or Spurious Emission screen. (*cf.* DSPL)
- This setting is not possible when Trigger is set to Free Run (*cf.* TRG).

■ Initialization command

*RST

■ Use example

Sets trigger-signal rise slope as the trigger reference.

<Program>

DSPL SETCOM

TRG EXT

TRGEDGE RISE

TRGEDGE?

<Response>

RISE

TRGLVL

■ Function

Trigger Level

Sets the Trigger Detection Level.

■ Syntax

Program Message	Query Message	Response Message
TRGLVL *level*	TRGLVL?	*level*

■ Parameter

level

Trigger level setting

Value	Trigger (Wide IF) Level Setting	Initial value
LOW	Sets the trigger level to Low.	*
MIDDLE	Sets the trigger level to Middle.	
HIGH	Sets the trigger level to High.	

■ Initialization command

PRE, INI, IP, *RST

■ Restrictions

- This setting is possible only when Trigger is set to Wide IF (*cf.* TRG).
- This setting can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Sets Trigger Level to Middle.

<Program>

DSPL SETCOM

MEASOBJ RACH

TRGLVL MIDDLE

TRGLVL?

<Response>

MIDDLE

TRVIEW_MOD

■ Function

Trace View for Code vs Time

Sets Trace View when Trace Format is set to Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
TRVIEW_MOD *a*	TRVIEW_MOD?	*a*

■ Parameter

Value of a

Trace view setting

Value	Trace View Setting	Initial value
CDCDVSTM	Sets Trace View to Code Domain Power and Code vs. Time.	*
CDVSTM	Sets Trace View to Code vs. Time.	
CODE	Sets Trace View to Code Domain Power.	

■ Restrictions

- This setting is possible only when the Trace Format is Set to Code vs. Time (*cf.* TRFORM).
- This setting is can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the Trace View to Code vs. Time.

<Program>

DSPL SETCOM

MEASOBJ DNLNKCOMP

DSPL MODANAL

TRFORM CDVSTM

TRVIEW_MOD CDVSTM

TRVIEW_MOD?

<Response>

CDCDVSTM

TRVIEW_RFPWR

■ Function

Trace View for Transmitter Power

Sets Trace View when Measure Method is set to TRC or RACH at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
TRVIEW_RFPWR *a*	TRVIEW_RFPWR?	*a*

■ Parameter

Value of a

Trace view setting

Value	Trace View Setting	Initial value
EXPNDTOTAL	Sets Trace View to Expand Waveform and Total Waveform.	*
TOTAL	Sets Trace View to Total Waveform.	
EXPND	Sets Trace View to Expand Waveform	

■ Restrictions

- This setting is possible only when Measure Method is set to TPC or RACH (*cf.* DSPL).
- This setting is can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI IP, *RST

■ Use example

Sets the Trace View to Total Waveform.

<Program>

DSPL RFPWR, TRC

TRVIEW_RFPWR TOTAL

TRVIEW_RFPWR?

<Response>

TOTAL

TS

■ Function

Single Measure/Sweep

Executes a measurement and sweeping once.

This command functions the same as the SWP command.

Unlike the SNGLS command, when the Tx Tester accepts a command during measurement, the command is not processed immediately but is queued until the current measurement is completed.

Since the command following the TS command is processed after the current measurement is completed, this means that the synchronization (between the Tx Tester operation and the program to send the command) is ensured.

■ Syntax

Program Message	Query Message	Response Message
TS	---	---

■ Use example

Executes a measurement and sweeping once.

<Program>

TS

TXPWR

■ Function

Transmitter Power

At measurements of Modulation Analysis, Transmitter Power & TPC, Adjacent Channel Power, Spurious Emission and Spectrum Emission Mask, reads out average power at slot length interval with 5 MHz bandwidth.

■ Syntax

Program Message	Query Message	Response Message
---	TXPWR? *unit*	*txpwr*

■ Parameter

unit

Specification of output unit

Value	Output Unit
DBM	dBm
WATT	W

txpwr

Tx Power

Resolution	Unit (Depends on the value specified by *unit*.)
0.01	dBm
0.001	W

■ Use example

Reads out measured results of TX Power.

<Program>

DSPL SUPRIOUS,SPOT

SWP

TXPWR? DBM

<Response>

18.53

TZEROSET

■ Function

Tester Root Zero Set

Performs Tester Root Zero Set at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
TZEROSET	---	---

■ Restrictions

- This setting is possible only when the displayed measurement screen is Transmitter Power screen. (*cf.* DSPL)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Performs Zero Set.

<Program>

DSPL RFPWR,FILTER

TZEROSET

TZEROSETVAL

■ Function

Tester Root Zero Set Value

Reads out Tester Root Zero Set at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
---	TZEROSETVAL?	*a*

■ Parameter

Tester Root Zero Set Value

Resolution	Unit
0.01	dBm

■ Restrictions

- This setting is possible only when the displayed measurement screen is Transmitter Power screen. (*cf.* DSPL)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Used example

Reads out Zero Set Value.

<Program>

DSPL RFPWR,FILTER

TZEROSET

TZEROSETVAL?

<Response>

0.00

TZEROSET_SW

■ Function

Tester Root Zero Set Value Used or Not

Sets whether Tester Root Zero Set Value used or not at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
TZEROSET_SW *a*	TZEROSET_SW?	*a*

■ Value of a

Setting Tester Root Zero Set to On or Off

Value	Setting Tester Root Zero Set to On or Off	Initial Value
0	Tester Root Zero Set Value is not used.	*
1	Tester Root Zero Set Value is used	

■ Restrictions

- This setting is possible only when the displayed measurement screen is Transmitter Power screen. (*cf.* DSPL)
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Use Zero Set Value.

<Program>

DSPL RFPWR,FILTER

TZEROSET_SW 1

TZEROSET_SW?

<Response>

1

UNIT_ADJ

■ Function

Sets the unit for Leakage Power at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
UNIT_ ADJ *unit*	UNIT_ ADJ?	*unit*

■ Parameter

unit

Unit for Leakage Power

Value	Unit for Leakage Power	Initial value
DB	dB	*
DBM	dBm	
MW	mW	
UW	μW	
NW	nW	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the unit for Leakage Power to mW.

<Program>

MEAS ADJ,MOD
UNIT_ADJ MW
UNIT_ADJ?

<Response>

MW

UNIT_CDP

■ Function

Power Unit for Code Domain Power

Sets the unit of Code Domain Power when Trace Format is Code Domain or Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
UNIT_ CDP *unit*	UNIT_ CDP?	*unit*

■ Parameter

unit

Display Unit

Value	Display Unit	Initial value
DBM	Displays Absolute Value (dBm).	
DB	Displays Relative Value (dB).	*

■ Restrictions

- This setting is possible only when Trace Format is Code Domain or Code vs. Time. (*cf.* TRFORM)

■ Use example

Sets Code Domain Power to display absolute value.

<Program>
DSPL MODANAL
TRFORM CODE
UNIT_CDP DBM
UNIT_CDP?

<Response>
DBM

UNIT_IQL

■ Function

Sets the unit for IQ Level screen.

■ Syntax

Program Message	Query Message	Response Message
UNIT_IQL *unit*	UNIT_IQL?	*unit*

■ Parameter

unit

Unit for level readout

Value	Unit for Level Readout	Initial value
DBMV	dBmV	*
MV	mV	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the unit for level readout to mV.

<Program>

UNIT_IQL MV

UNIT_IQL?

<Response>

MV

■ Restrictions according to model type and options

For MS268x, this command is not available when option MS268xA/B-17, 18 IQ input is not installed.

UNIT_MOD

■ Function

Power Unit in Zoom-In for Code vs Time
When Trace Format is set to Code vs. Time and Trace View is set to Code vs. Time at Modulation Analysis screen, sets the unit when ZOOM_MOD is set to “In”.
This setting is reflected to analysis Code Domain Power.

■ Syntax

Program Message	Query Message	Response Message
UNIT_ MOD *unit*	UNIT_ MOD?	*unit*

■ Parameter

unit
Display Unit

Value	Display Unit	Initial value
DBM	Displays Absolute Value (dBm).	
DB	Displays Relative Value (dB).	*

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK (*cf.* MEASOBJ).
- This setting can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Displays Absolute Value.
<Program>
DSPL SETCOM
MEASUOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
TRVIEW_MOD CDVSTM
ZOOM_MOD IN
UNIT_MOD DBM
UNIT_MOD?

<Response>
DBM

UNIT_SMASK

■ Function

Unit for Spectrum Emission Mask

Sets the unit of measurement result on the Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
UNIT_SMASK *a*	UNIT_SMASK?	*a*

■ Value of a

Unit for Offset frequency vs Power

Value	Unit for Offset frequency vs Power	Initial value
DB	dB	*
DBM	dBm	
MW	mW	
UW	μW	
NW	nW	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Unit to mW.

<Program>

UNIT_SMASK MW

UNIT_SMASK?

<Response>

MW

UNIT_SPU

■ Function

Sets the unit for level readout at Spurious Emission measurement.

■ Syntax

Program Message	Query Message	Response Message
UNIT_SPU *unit*	UNIT_SPU?	*unit*

■ Parameter

unit

Unit for level readout

Value	Unit for Level Readout	Initial Value
DBM	dBm	*
DB	dB	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the unit for level readout to dB.

<Program>

DSPL SPURIOUS, SPOT

UNIT_SPU DB

UNIT_SPU?

<Response>

DB

UPCODESYNC

■ Function

Scrambling Code Synchronization

Sets either a long scrambling code or short scrambling code for use when Measuring Object is set to UP-Link on the Setup Common Parameter screen.

■ Syntax

Program Message	Query Message	Response Message
UPCODESYNC *code*	UPCODESYNC?	*code*

■ Parameter

code

Scrambling Code

Value	Scrambling Code	Initial Value
LONG	Use the long scrambling code as the scrambling code.	*
SHORT	Use the short scrambling code as the scrambling code.	

■ Restrictions

- This setting is not possible when the displayed measurement screen is other than the Setup Common Parameter screen. (*cf.* DSPL)
- This setting is not possible when Measuring Object is set to Down-Link or QPSK. (*cf.* MEASOBJ)

■ Initialization command

*RST

■ Use example

Uses the long scrambling code as the scrambling code.

<Program>
DSPL SETCOM
MEASOBJ UPLNK
UPCODESYNC LONG
UPCODESYNC?

<Response>
LONG

VBM_ADJ

■ Function

VBW: Manual/Auto

Sets either manual or automatic for setting VBW on the Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
VBM_ADJ *a*	VBM_ADJ?	*a*

■ Value of a

VBW setting mode

Value	Mode	Initial value
MAN	Sets VBW to the manual setting mode	
AUTO	Sets VBW to the automatic setting mode	*

■ Restrictions

- When VBW is changed while Auto is set, the setting is forcibly set to Manual.
- When Auto is set, the VBW value is automatically set from the values of RBW and VBW/RBW Ratio.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW to the automatic setting mode

<Program>

VBM_ADJ AUTO

VBM_ADJ?

<Response>

AUTO

VBM_OBW

■ Function

VBW: Manual/Auto

Sets either manual or automatic for setting VBW on the Occupied Bandwidth screen.

■ Syntax

Program Message	Query Message	Response Message
VBM_OBW *a*	VBM_OBW?	*a*

■ Value of a

VBW setting mode

Value	Mode	Initial value
MAN	Sets VBW to the manual setting mode	
AUTO	Sets VBW to the automatic setting mode	*

■ Restrictions

- When VBW is changed while Auto is set, the setting is forcibly set to Manual.
- When Auto is set, the VBW value is automatically set from the values of RBW and VBW/RBW Ratio.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set VBW to automatic setting mode.

<Program>

VBM_OBW AUTO

VBM_OBW?

<Response>

AUTO

VBM_SMASK

■ Function

VBW: Manual/Auto for Spurious Emission Mask

Sets either manual or automatic for setting VBW on Spectrum Emission Mask screen.

■ Syntax

Program Message	Query Message	Response Message
VBM_SMASK *a*	VBM_SMASK?	*a*

■ Value of a

VBW setting mode

Value	Mode	Initial value
MAN	Sets VBW to the manual setting mode	
AUTO	Sets VBW to the automatic setting mode	*

■ Restrictions

- When VBW is changed while Auto is set, the setting is forcibly set to Manual.
- When Auto is set, the VBW value is automatically set from the values of RBW and VBW/RBW Ratio.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set VBW to the automatic setting mode.

<Program>

VBM_SMASK AUTO

VBM_SMASK?

<Response>

AUTO

VBR_ADJ

■ Function

VBW/RBW Ratio for Adjacent Channel Power

Sets the ratio of VBW to RBW use in VBW automatic setting on Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
VBR_ADJ *a*	VBR_ADJ?	*a*

■ Value of a

VBW/RBW Ratio

Range	Resolution	Initial value
0.0001 to 100	0.0001	1

■ Restrictions

- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value												
0.0001	0.0003	0.001	0.003	0.01	0.03	0.1	0.3	1	3	10	30	100

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Set VBW/RBW Ratio to 3.

<Program>

VBR_ADJ 3

VBR_ADJ?

<Response>

3

VBR_OBW

■ Function

VBW/RBW Ratio for Occupied Bandwidth

Sets the ratio of VBW to RBW used in VBW automatic setting on Occupied Bandwidth measurement.

■ Syntax

Program Message	Query Message	Response Message
VBR_OBW *a*	VBR_OBW?	*a*

■ Parameter

VBW/RBW Ratio

Range	Resolution	Initial value
0.0001 to 100	0.0001	1

■ Restrictions

- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value												
0.0001	0.0003	0.001	0.003	0.01	0.03	0.1	0.3	1	3	10	30	100

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW/RBW Ratio to 3.

<Program>

VBR_OBW 3

VBR_OBW?

<Response>

3

VBR_SMASK

■ Function

VBW/RBW Ratio for Spectrum Emission Mask

Sets the ratio of VBW to RBW used in VBW automatic setting at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
VBR_SMASK *a*	VBR_SMASK?	*a*

■ Value of a

VBW/RBW Ratio

Range	Resolution	Initial value
0.0001 to 100	0.0001	1

■ Restrictions

- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value												
0.0001	0.0003	0.001	0.003	0.01	0.03	0.1	0.3	1	3	10	30	100

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW/RBW Ratio to 3.

<Program>

VBR_SMASK 3

VBR_SMASK?

<Response>

3

VBW_ADJ

■ Function

Video Bandwidth for Adjacent Channel Power

Sets VBW (Video Bandwidth) of Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
VBW_ADJ *a*	VBW_ADJ?	*a*

■ Value of a

VBW

Range	Resolution	Initial value	Unit
0 (OFF) to 3000000	1	300000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GZ: GHz

■ Restrictions

- This setting is not possible when RBW Mode is Digital (*cf.* RBD_ADJ).
- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value														
0Hz (OFF)	1 Hz	3 Hz	10 Hz	30 Hz	100 Hz	300 Hz	1 kHz	3 kHz	10 kHz	30 kHz	100 kHz	300 kHz	1 MHz	3 MHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW to 30 kHz.

<Program>

VBW_ADJ 30KHZ

VBW_ADJ?

<Response>

30000

VBW_OBW

■ Function

Video Bandwidth for Occupied Bandwidth

Sets VBW (Video Bandwidth) of Occupied Bandwidth measurement using a spectrum analyzer.

■ Syntax

Program Message	Query Message	Response Message
VBW_OBW *a*	VBW_OBW?	*a*

■ Value of a

VBW

Range	Resolution	Initial value	Unit
0 (OFF) to 3000000	1	100000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHZ, GZ: GHz

■ Restrictions

- This setting is not possible when RBW Mode is Digital (*cf.* RBWTP_OBW).
- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value														
0Hz (OFF)	1 Hz	3 Hz	10 Hz	30 Hz	100 Hz	300 Hz	1 kHz	3 kHz	10 kHz	30 kHz	100 kHz	300 kHz	1 MHz	3 MHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW to 30 kHz.

<Program>

VBW_OBW 30KHZ

VBW_OBW?

<Response>

30000

VBW_SMASK

■ Function

Video Bandwidth for Spectrum Emission Mask

Sets VBW (Video Bandwidth) at Spectrum Emission Mask measurement.

■ Syntax

Program Message	Query Message	Response Message
VBW_SMASK *a*	VBW_SMASK?	*a*

■ Value of a

VBW

Range	Resolution	Initial value	Unit
0 (OFF) to 3000000	1	30000	Hz

□ Suffix code

None: Hz

HZ: Hz

KHZ, KZ: kHz

MHZ, MZ: MHz

GHz, GZ: GHz

■ Restrictions

- This setting is not possible when RBW Mode is Digital (*cf.* RBWTP_SMASK).
- Any value may be input into the setting range. However, the value that is actually set is the value in Table below.

Setting value														
0Hz (OFF)	1 Hz	3 Hz	10 Hz	30 Hz	100 Hz	300 Hz	1 kHz	3 kHz	10 kHz	30 kHz	100 kHz	300 kHz	1 MHz	3 MHz

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets VBW to 30 kHz.

<Program>

VBW_SMASK 30KHZ

VBW_SMASK?

<Response>

30000

VECTERR

■ Function

RMS EVM

Outputs the measured results of RMS EVM at the Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	VECTERR?	*rms*

■ Parameter

rms

RMS EVM

Resolution	Unit
0.01	%

■ Use example

Reads out the measured results of RMS EVM.

<Program>

DSPL MODANAL

SWP

VECTERR?

<Response>

23.48

VIEW_SPU

■ Function

View for Spurious Emission

Selects RBW/VBW/SWT, Ref-Level/ATT, or Judgment result to display on the right of the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
VIEW_SPU *a*	VIEW_SPU?	*a*

■ Value of a

Display item

Value	Display item	Initial Value
JDG	Displays Judgment.	*
BWSWT	Displays RBW/VBW/SWT.	
REFATT	Displays Ref-Level/ATT.	

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays RBW/VBW/SWT.

<Program>

```
DSPL SPURIOUS,SPOT
VIEW_SPU BWSWT
VIEW_SPU?
```

<Response>

```
BWSWT
```

VSCALE

■ Function

Vertical Scale for EVM, Phase Error and Magnitude Error

Sets the upper limit value of the vertical scale of the displayed coordinates, when Trace Format is set to EVM, Phase Error or Magnitude Error on the Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
VSCALE *limit*	VSCALE?	*limit*

■ Parameter

limit

Upper limit value of vertical scale

Value	Upper limit Value of Vertical scale	Initial value
5	5% (EVM, Magnitude Error), 5 deg (Phase Error)	
10	10% (EVM, Magnitude Error), 10 deg (Phase Error)	
20	20% (EVM, Magnitude Error), 20 deg (Phase Error)	*
50	50% (EVM, Magnitude Error), 50 deg (Phase Error)	
100	100% (EVM, Magnitude Error), 100 deg (Phase Error)	

■ Restrictions

- This setting is not possible when Trace Format is set to other than EVM, Phase Error or Magnitude Error. (*cf.* TRFORM).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the upper limit value of the Phase Error vertical scale to 50 [deg].

<Program>

MEAS MODANAL
TRFORM PHASE
VSCALE 50
VSCALE?

<Response>

50

VSCALE_CDP

■ Function

Vertical Scale for Code Domain

Sets the vertical scale range when Trace Format is set to Code Domain or Trace Format is set to Code vs. Time and Trace View is set to Code Domain at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
VSCALE_CDP *limit*	VSCALE_CDP?	*limit*

■ Parameter

limit

Vertical scale range

Value	Vertical Scale Range	Initial Value
20	0 to −20 dB	
40	0 to −40 dB	
60	0 to −60 dB	
80	0 to −80 dB	*

20,60: Valid only when the using measurement system is MX860x01B/MX268x01B.

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK (*cf.* MEASOBJ).

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the Code Domain display range to 0 dB thru 40 dB.

<Program>

MEAS MODANAL
TRFORM CODE
VSCALE_CDP 40
VSCALE_CDP?

<Response>

40

VSCALE_CVT

■ Function

Vertical Scale for Code vs Time

Sets the vertical scale range when Trace Format is set to Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
VSCALE_CVT *limit*	VSCALE_CVT?	*limit*

■ Parameter

limit

Vertical scale range

Value	Vertical Scale Range	Initial Value
20	20 to 40dBm	
40	0 to −40 dBm	
60	−20 to 40 dBm	
80	−40 to 40 dBm	*

■ Restrictions

- This setting is not possible when Measuring Object is set to QPSK. (*cf.* MEASOBJ).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the Code vs. Time display range to 0 dBm thru 40 dBm.

<Program>

MEAS MODANAL
TRFORM CDVSTM
VSCALE_CVT 40
VSCALE_CVT?

<Response>

40

VSCALE_RFPWR

■ Function

Vertical Scale for Transmitter Power (TPC, RACH)
Sets the vertical scale of waveform display at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
VSCALE_RFPWR *a,b,c*	VSCALE_RFPWR? *a*	*b,c,a*

■ Value of a

Selection of Trace

Value	Selection of Trace	Initial Value
TOTAL	Selects Total Waveform.	*
LEAD	Selects Expand Waveform or Leading Trace of Expand Waveform	
TRAIL	Selects Trailing Trace of Expand Waveform. (Valid only when Waveform is set to Leading & Trailing.)	

■ Value of b

Vertical scale range

Value	Vertical Scale Range	Initial Value
20	0 to −20 dB	
40	0 to −40 dB	* (Measure Method: TPC)
60	0 to −60 dB	
80	0 to −80 dB	* (Measure Method: RACH)
100	0 to −100 dB	

■ Value of c

Maximum display level

Value	Resolution	Initial Value	Unit
(Ref Level −50 dB) to (Ref Level +50 dB) (cf. RFLVL)	1 dB	Ref Level +20 dB (rounded up value at 5 dB unit) (Measure Method: RACH)	dBm
0 to 50 dB	1 dB	20 dB (Measure Method: TPC)	dB

□ Suffix code

None: dBm
DBM: dBm
DB: dB

■ Restrictions

- This setting is possible only when Measure Method is set to TPC or RACH (*cf.* DSPL).
- This setting can be used only when using measurement system is MX860801B/MX860901B.

■ Initialization command

PRE, INI, IP, ∗RST

■ Use example

Sets scale range of Total Waveform and maximum level to 20 dB, 6 dBm.

<Program>

DSPL RFPWR, TPC

TLVL_RFPWR TOTAL,20,6DBM

TLVL_RFPWR? TOTAL

<Response>

20, 6, TOTAL

WAVEFORM

■ Function

Waveform Display

Sets the waveform window to On or Off on the Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
WAVEFORM *on_off*	WAVEFORM?	*on_off*

■ Parameter

on_off

Setting Waveform Window to On or Off

Value	Setting Waveform Window to On or Off	Initial Value
ON	Displays the waveform window.	
OFF	Does not display the waveform window.	*

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays the waveform window.

<Program>

DSPL RFPWR,FILTER

WAVEFORM ON

WAVEFORM?

<Program>

ON

WAVEFORM_SPU

■ Function

Sets the waveform window to On or Off on the Spurious Emission screen.

■ Syntax

Program Message	Query Message	Response Message
WAVEFORM_SPU *on_off*	WAVEFORM_SPU?	*on_off*

■ Parameter

on_off

Setting waveform window to On or Off

Value	Setting Waveform Window to On or Off	Initial Value
ON	Displays the waveform window.	
OFF	Does not display the waveform window.	*

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays Waveform window at spurious emission measurement.

<Program>

DSPL SPURIOUS, SWEEP

WAVEFORM_SPU ON

WAVEFORM_SPU?

<Response>

ON

WAVETBLNO_SPU

■ Function

Displays wave forms of each table

Specifies the frequency table number for spurious emission displayed on waveform window.

■ Syntax

Program Message	Query Message	Response Message
WAVETBLNO_SPU *a*	WAVETBLNO_SPU?	*a*

■ Parameter

Value of a

Table No

Range
F1 to F15

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Displays waveforms of F1.

<Program>
DSPL SPURIOUS, SPOT
SWP
WAVETBLNO_SPU F1
WAVETBLNO_SPU?

<Response>
F1

WAVQUAL

■ Function

Waveform Quality Factor

Outputs the measured results for Waveform Quality Factor at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
---	WAVQUAL?	*qual*

■ Parameter

qual

Waveform Quality Factor

Resolution	Unit
0.00001	None

■ Use example

Reads out the measured results for Waveform Quality Factor.

<Program>
DSPL MODANAL
SWP
WAVQUAL?

<Response>
0.98801

WIDE_ADJ

■ Function

Wide Dynamic Range

Sets Wide Dynamic Range to On or Off at Adjacent Channel Power measurement.

■ Syntax

Program Message	Query Message	Response Message
WIDE_ADJ *on_off*	WIDE_ADJ?	*on_off*

■ Parameter

on_off

Setting Wide Dynamic Range to On or Off

Value	Display format setting	Initial Value
ON	Sets Wide Dynamic Range to On	
OFF	Sets Wide Dynamic Range to Off	*

■ Restrictions

- This setting is not possible when Measure Method is set to Spectrum.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets Wide Dynamic Range to On.

<Program>

DSPL ADJ,MOD

SWP

WIDE_ADJ ON

WIDE_ADJ?

<Response>

ON

WINDOW_RFPWR

■ Function

Display Window for Transmitter Power

Sets the display format of Expand Waveform when Measure Method is set to TPC or RACH at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
WINDOW_RFPWR *a*	WINDOW_RFPWR?	*a*

■ Parameter

Value of a

Displays format setting

Value	Displays format setting	Initial Value
SLOT	Slot: Displays slot section.	*
LEAD	Leading: Displays expanded boundary section of the former one slot.	
TRAIL	Trailing: Displays expanded boundary section of the latter one slot.	
LEADTRAIL	Leading & Trailing: Displays both LEAD and TRAIL.	

■ Restrictions

- This setting is possible only when Measure Method is set to TPC or RACH (*cf.* DSPL).
- LEADTRAIL is possible only when Measure Method is set to TPC.
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Sets the trace view Total Waveform.

<Program>

DSPL RFPWR,TPC

WINDOW_RFPWR LEAD

WINDOW_RFPWR?

<Response>

LEAD

WRDATA_DEMOD

■ Function

Write Demodulation Data down to the PC Card
Save demodulation data to PC Card at the Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
WRDATA_DEMOD *format*	---	---

■ Parameter

format

Modulation type specification

Value	Modulation Type Specification
HEX	Records a demodulation risult as in hexadecimals.
BIN	Records a demodulation risult as in binary

■ Restrictions

- This setting is possible when Measuring Object is set to other than UP Link (RACH) or QPSK. (*cf.* MEASOBJ)
- This command is possible only when displayed measurement screen is Demodulation Data screen. (*cf.* DSPL)
- This command can not perform during measurement.
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Save demodulation data to PC Card in hexadecimals.

<Program>

DSPL DEMOD
SWP
WRDATA_DEMOD HEX

WRTMLTCALDATA

■ Function

Write Multi Carrier Calibration data
Saves Correction Factor to use for Multi Carrier Calibration to PC Card.

■ Syntax

Program Message	Query Message	Response Message
WRTMLTCALDATA	---	---

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.
- This command is possible only when MS8609A-33 is installed.
- This setting is not possible when Terminal is set to other than RF. (*cf.* TERM)

■ Use example

Execute “Write Multi Carr. Car. Data.”
<Program>
DSPL MODANAL
WRTMLTCALDATA

XMAG

■ Function

Reads out and processes the waveform by Graph method in Spectrum All Mode at Adjacent Channel Power measurement. The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMAG *w_addr,w_data*	XMAG? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

w_data

- 16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are written using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a single address portion can be written at a time.

addr

Read start address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

n

Number of read out data

Range	Resolution	Number of measurement data
1 to 501	1	501
1 to 1001	1	1001

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- Ranges of *w_addr, addr, n* are changed by setup value of measured data number. (*cf.* DPTS_ADJ)

■ Use example

Reads out five waveform data (by Graph method in Spectrum All mode) starting from the memory address 0 at Adjacent Channel Power measurement.

<Program>
DSPL ADJ,SPECT1
SWP
XMAG? 0,5

<Response>
−12, −24, −14, −13, −18

XMB

■ Function

Reads out and processes the waveform data in the Spectrum All mode at Adjacent Channel Power measurement.

The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMB *w_addr,w_data*	XMB? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

w_data

16-bit waveform data to be written to *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are written using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a single address portion can be written at a time.

addr

Read start address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

n

Number of read out data

Range	Resolution	Number of measurement data
1 to 501	1	501
1 to 1001	1	1001

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integer in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- Ranges of *w_addr, addr, n* are changed by setup value of measure data number. (*cf.* DPTS_ADJ)

■ Use example

Reads out five waveform data (in Spectrum All mode) starting from memory address 0 at Adjacent Channel Power measurement.

<Program>

```
DSPL ADJ,SPECT1
SWP
XMB? 0,5
```

<Response>

−4757, −4795, −4702, −4857, −4502

XMBS

■ Function

Reads out and processes the waveform data (in the Spectrum Separate mode) at Adjacent Channel Power measurement.

The x-coordinate (for any points on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMBS *w_addr,w_data*	XMBS? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution	Number of measurement data
0 to 2504	1	501
0 to 5004	1	1001

- 0 represents the x-coordinate of the origin.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are written using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a single address portion can be written at a time.

addr

Read start address for data

Range	Resolution	Number of measurement data
0 to 2504	1	501
0 to 5004	1	1001

- 0 represent the x-coordinate of the origin.

n

Number of read out data

Range	Resolution	Number of measurement data
0 to 2505	1	501
0 to 5005	1	1001

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integer in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- Ranges of *w_addr, addr, n* are changed by step value of measure data number. (*cf.* DPTS_ADJ)

■ Use example

Reads out five waveform data (in the Spectrum Separate mode) starting from memory address 0 at Adjacent Channel Power measurement.
<Program>
DSPL ADJ,SPECT2
SWP
XMBS? 0,5

<Response>
−4757, −4795, −4702, −4857, −4502

XMC

■ Function

Reads out and processes the IQ signal waveform data at Modulation Analysis measurement.

■ Syntax

Program Message	Query Message	Response Message
XMC *iq,w_addr,w_data*	XMC? *iq,addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

iq

Selection of Phase I or Q

Value	Selection of Phase I or Q
0	I-phase
1	Q-phase

w_addr

Write address for data

Range	Resolution
0 to 25590	1

- 1 corresponds to 0.1 chip

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.0001 units, where the ideal signal “1” becomes 10,000.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 25590	1

- 1 corresponds to 0.1 chip.

n

Number of read out data

Range	Resolution
1 to 25591	1

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.0001 units, where the ideal signal “1” becomes 10,000.

■ Use example

Reads out five I-signal waveform data starting form memory address 0.

<Program>

DSPL MODANAL

SWP

XMC? 0,0,5

<Response>

0, −1,0, −1,0

XMD

■ Function

Reads out and processes the waveform data of Waveform Display when Measure Method is set to Tx Power, Filtered Power or Tx Power & Filtered Power at Transmitter Power measurement.

Reads out and processes the waveform data of Expand Waveform when Measure Method is set to TPC or RACH.

The x-coordinate (for point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMD *w_addr,w_data*	XMD? *addr,n*	*data(addr),data(addr+1)...,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution	Measure Method (*cf.* DSPL)
0 to 292	1	Tx Power, Filtered Power , Tx Power & Filtered Power
0 to 3468	1	TPC
0 to 5068	1	RACH

- 0 represents the x-coordinate of the origin.

w_data

16-bit waveform data written to address *w_data*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dBm units, where 1 dBm becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution	Measure Method (*cf.* DSPL)
0 to 292	1	Tx Power, Filtered Power , Tx Power & Filtered Power
0 to 3468	1	TPC
0 to 5068	1	RACH

- 0 represents the x-coordinate of the origin.

n

Number of read-out data

Range	Resolution	Measure Method (*cf.* DSPL)
0 to 293	1	Tx Power, Filtered Power , Tx Power & Filtered Power
0 to 3469	1	TPC
0 to 5069	1	RACH

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dBm units, where 1 dBm becomes 100.

■ Use example

Reads out five Transmitter Power waveform data starting from memory address 0.

<Program>

DSPL RFPWR,TPC

SWP

XMD? 0,5

<Response>

4012, 3743, 3823, 4272, 4008

XMDE

■ Function

Reads out and processes the Trailing waveform data of Expand Waveform when Measure Method is set to TPC at Transmitter Power measurement.

The x-coordinate (for point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMDE *w_addr,w_data*	XMDE? *addr,n*	*data(addr),data(addr+1)...,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 3468	1

- 0 represents −100.0 of the x-coordinate.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers is 0.01 dB units, where 1 dB becomes 100.
- Only data for a single address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 3468	1

- 0 represents −100.0 of the x-coordinate.

n

Number of read out data

Range	Resolution
1 to 3469	1

data(addr)

16-bit waveform data at address *addr*.

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 units, where 1 dB becomes 100.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out five Transmitter Power waveform data starting from memory address 0.

<Program>

DSPL RFPWR,TPC

SWP

XMDE? 0,5

<Response>

4012, 3743, 3823, 4272, 4008

XMDR

■ Function

Reads out and processes the Total waveform data when Measure Method is set to RACH at Transmitter Power measurement. The x-coordinate (for point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMDR *w_addr,w_data*	XMDR? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data.

Range	Resolution
0 to 1040	1

- 0 represents −2.00 of the x-coordinate.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers is 0.01 dB units, where 1 dB becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 1040	1

- 0 represents −2.00 of the x-coordinal
- 0 is outputted when addr is set the value which is bigger than the time for acquiring waveform. (cf. CAPTIME_RFPWR)

n

Number of read out data

Range	Resolution
1 to 1041	1

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 units, where 1 dB becomes 100.

■ Restrictions

- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out five Transmitter Power waveform data starting from memory address 0.

<Program>

DSPL RFPWR,RACH

SWP

XMDR? 0,5

<Response>

4012, 3743, 3823, 4272, 4008

XME

■ Function

Reads out and processes the waveform data at Occupied Bandwidth measurement.
The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XME *w_addr, w_data*	XME? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

w_data

16-bit waveform data to be written to address *w_adrr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution	Number of measurement data
0 to 500	1	501
0 to 1000	1	1001

- 0 represents the x-coordinate of the origin.

n

Number of read out data

Range	Resolution	Number of measurement data
1 to 501	1	501
1 to 1001	1	1001

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- Ranges of *w_addr, addr, n* are changed by setup value of measured data number. (*cf.* DPTS_OBW)

■ Use example

Reads out ten Occupied Bandwidth waveform data starting from memory address 0.

<Program>

```
DSPL OBW,FFT
SWP
XME? 0,10
```

<Response>

−8829, −8925, −8776, −8771, −8735, −8636, −8882, −8806, −8700, −8846

XMF

■ Function

Wave Data for Spectrum Emission Mask

Reads out and processes waveform data at Spectrum Emission Mask measurement.

The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMF *a,b,c*	XMF? *a,d,e*	*f(1),f(2),…f(d)*

■ Value of a

Trace selection

Value	Trace
0	RBW: Waveform at 30 kHz
1	RBW: Waveform at 1 MHz

■ Value of b

Write address for data

Range	Resolution
0 to 500	1

- 0 represents the x-coordinate of the origin.

■ Value of c

16-bit waveform data to be written to address b

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a signal address portion can be written at a time.

■ Value of d

Read start address for data

Range	Resolution
0 to 500	1

- 0 representes to x-coordinate for the origin.

■ Value of e

Number of read out data

Range	Resolution
1 to 501	1

■ Value of f(n)

16-bit waveform data at address d

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- This command can be used only when the using measurement system version 3.0 or before.

■ Use example

Reads out waveform data when RBW = 30 kHz starting at memory address 0 during Spectrum Emission Mask measurement.

<Program>
DSPL SMASK
SWP
XMF? 0,0,5

<Response>
−4757,−4795,−4702,−4857,−4502

■ Note

Use XMFN to read out and processeds data when the using measurement system is version 3.1 or later.

XMFN

■ Function

Waveform Data for Spectrum Emission Mask

Reads and edits waveform data during Spectrum Emission Mask measurement. The read/write start address and the data to be read/written corresponds to the x-axis at any point on the waveform displayed in the y-axis of the waveform, respectively.

■ Syntax

Program Message	Query Message	Response Message
XMFN *a,b*	XMFN? *c,d*	*e(1),e(2),...e(d)*

■ Value of a

Write address for data

Range	Resolution
0 to 2400	1

- 0 corresponds to x-coordinate for the origin.

■ Value of b

16-bit waveform data to be written to address a

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a signal address portion can be written at a time.

■ Value of c

Read start address for data

Range	Resolution
0 to 2400	1

- 0 corresponds to x-coordinate for the origin.

■ Value of d

Number of read out data

Range	Resolution
1 to 2401	1

■ Value of e(n)

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- This command is possible only when the using measurement system is version 3.1 or later.

■ Use example

Reads out waveform data starting at memory address 0 during Spectrum Emission Mask measurement.

<Program>
DSPL SMASK
SWP
XMFN? 0,5

<Response>
−4757, −4795, −4702, −4852, −4502

XMG

■ Function

Waveform Data for Spurious Emission

Reads out and processes frequency-axis sweep waveform data at Spurious Emission measurement.

The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMG *Fa,b,c*	XMG? *Fa,d,e*	*f(1),f(2),…f(d)*

■ Value of a

Trace selection

Range	Resolution
1 to 15	1

■ Value of b

Write address for data

Range	Resolution
0 to 500	1

- 0 represents the x-coordinate of the origin.

■ Value of c

16-bit waveform data to be written to address b.

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dB units, where 1 dB becomes 100.
- Only data for a signal address portion can be written at a time.

■ Value of d

Read start address for data

Range	Resolution
0 to 500	1

- 0 corresponds to x-axis for the origin

■ Value of e

Number of read out data

Range	Resolution
1 to 501	1

■ Value of f(n)

16bit waveform data at address d

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- This setting can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Use example

Reads out waveform data of F10 starting at memory address 0 at Spurious Emission measurement.

<Program>

DSPL SPURIOUS,SWEEP

SWP

XMG? 10,0,5

<Response>

−4757, −4795, −4702, −4857, −4502

XMGT

■ Function

Wave Data for Spurious Emission

Reads out and processes time-axis sweep waveform data at Spurious Emission measurement.

The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Function

Program Message	Query Message	Response Message
XMGT *Fa,b,c*	XMGT? *Fa,d,e*	*f(1),f(2),…f(d)*

■ Value of a

Trace selection

Range	Resolution
1 to 15	1

■ Value of b

Write address for data

Range	Resolution
0 to 500	1

- 0 corresponds to x-coordinate for the origin.

■ Value of c

16-bit waveform data to be written to address b

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 dB units, where 1dB becomes 100.
- Only data for a signal address portion can be written at a time.

■ Value of d

Read start address for data

Range	Resolution
0 to 500	1

- 0 corresponds to x-coordinate for the origin.

■ Value of e

Number of read out data

Range	Resolution
1 to 501	1

■ Value of f(n)

16-bit waveform data at address d

Range	Resolution
−32768 to 32767	1

- Data read out using integer in 0.01 dB units, where 1 dB becomes 100.

■ Restrictions

- This setting can be used only when the using measurement system is MX268x01B/MX268x01B.

■ Use example

Reads out waveform data of F10 starting at memory address 0 at Spurious Emission measurement.

<Program>

DSPL SPURIOUS,SPOT

SWP

XMGT? 10,0,5

<Response>

−4757, −4795, −4702, −4857, −4502

XMM

■ Function

Outputs and processes the demodulation data of decimal integer at Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
XMM *w_addr,w_data,frame*	XMM? *addr,n,frame*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 11999	1

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
0 to 65535	1

frame

Object Frame

<table>
<tr><th>Range</th><th>Object Frame</th></tr>
<tr><td>None</td><td rowspan="2">Sets object frame to Normal Frame.</td></tr>
<tr><td>0</td></tr>
<tr><td>1</td><td>Sets object frame to Compressed Frame.</td></tr>
</table>

addr

Read start address for data

Range	Resolution
0 to 11999	1

- 0 represents the x-coordinate of the origin.

n

Number of read out data

Range	Resolution
1 to 12000	1

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
0 to 65535	1

■ Use example

Reads out ten data starting from Demodulation Data memory address 0.
<Program>
MEAS DEMOD
XMM? 0,10

<Response>
65, 87, 23, 99, 11, 34, 456, 234, 78, 29

XMMH

■ Function

Outputs and processes the demodulation data by Hexadecimal integer at Demodulation Data measurement.

■ Syntax

Program Message	Query Message	Response Message
XMMH *w_addr,w_data,frame*	XMMH? *addr,n,frame*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 11999	1

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
0 to FFFF	1

frame

Object Frame

Range	Object Frame
None	Sets object frame to Normal Frame.
0	
1	Sets object frame to Compressed Frame.

addr

Read start address for data

Range	Resolution
0 to 11999	1

- 0 represents the x-coordinate of the origin.

n

Number of read out data

Range	Resolution
1 to 12000	1

data(addr)
16-bit waveform data at address *addr*

Range	Resolution
0 to FFFF	1

■ Use example

Reads out ten data starting from Demodulation Data memory address 0.
<Program>
MEAS DEMOD
XMMH? 0,10

<Response>
0, 8, C, 1F, 9, 7, 7, 8, A, C

XMN

■ Function

Reads out and processes the Magnitude Error waveform data at Modulation Analysis measurement.
The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMN *w_addr,w_data*	XMN? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01% units, where 1 % becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

n

Number of read out data

Range	Resolution
1 to 2560	1

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 % units, where 1 % becomes 100.

■ Use example

Reads out five Magnitude Error waveform data starting from memory address 0.

<Program>

DSPL MODANAL

SWP

XMN? 0,5

<Response>

0, 1413, −1, −7415, −1

XMP

■ Function

Reads out and processes the Phase Error waveform data at Modulation Analysis measurement.
The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMP *w_addr,w_data*	XMP? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 deg units, where 1 deg becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

n

Number of read-out data

Range	Resolution
1 to 2560	1

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01 deg units, where 1 deg becomes 100.

■ Use example

Reads out five Phase Error waveform data starting from memory address 0.

<Program>

DSPL MODANAL

SWP

XMP? 0,5

<Response>

−1, −1660, 0, 8679, 0

XMV

■ Function

Reads out and processes the EVM waveform data at Modulation Analysis measurement.

The x-coordinate (for any point on a waveform displayed in the waveform window) corresponds to the write/read start address. Likewise, the y-coordinate corresponds to the data to be written or read out.

■ Syntax

Program Message	Query Message	Response Message
XMV *w_addr,w_data*	XMV? *addr,n*	*data(addr),data(addr+1)…,data(addr+n)*

■ Parameter

w_addr

Write address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

w_data

16-bit waveform data to be written to address *w_addr*

Range	Resolution
−32768 to 32767	1

- Data are set using integers in 0.01% units, where 1 % becomes 100.
- Only data for a signal address portion can be written at a time.

addr

Read start address for data

Range	Resolution
0 to 2559	1

- 0 represents the x-coordinate (0 chip) of the origin.

n

Number of read out data

Range	Resolution
1 to 2560	1

data(addr)

16-bit waveform data at address *addr*

Range	Resolution
−32768 to 32767	1

- Data are read out using integers in 0.01 % units, where 1 % becomes 100.

■ Use example

Reads out five EVM waveform data starting from memory address 0.

<Program>

DSPL MODANAL

SWP

XMV? 0.5

<Response>

0, 3743, 0, 9272, 0

ZAJ

■ Function

Zero Set

Executes zero-point calibration for the power meter.

This command functions the same as the ZEROSET command.

■ Syntax

Program Message	Query Message	Response Message
ZAJ	---	---

■ Restrictions

- This function cannot be executed when the displayed measurement screen is other than the Power Meter screen. (*cf.* DSPL)

■ Use example

Executes “Zero Set”.

<Program>

DSPL PWRMTR

ZAJ

ZEROSET

■ Function

Zero Set

Executes zero-point calibration for the power meter.

This command functions the same as the ZAJ command.

■ Syntax

Program Message	Query Message	Response Message
ZEROSET	---	---

■ Restrictions

- This function cannot be executed when the displayed measurement screen is other than the Power Meter screen. (*cf.* DSPL)

■ Use example

Executes “Zero Set”.

<Program>

DSPL PWRMTR

ZEROSET

■ Restrictions according to model type and options

For MS268x, This command is not available.

ZOOM_MOD

■ Function

Zoom for Modulation Analysis (Code vs Time)

Sets zoom-in or zoom-out of Zoom Marker portion when Trace Format is set to Code vs. Time at Modulation Analysis screen.

■ Syntax

Program Message	Query Message	Response Message
ZOOM_MOD *a*	ZOOM_MOD?	*a*

■ Parameter

Value of a

Expansion display setting

Range	Expansion display Setting	Initial Value
IN	Expands and displays Zoom Marker portion.	
OUT	Displays whole waveform.	*

■ Restrictions

- This setting is possible only when Trace Format is set to Code vs. Time and Trace View is set to Code vs. Time (*cf.* TRFORM, TRVIEW_MOD).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Expands and displays Code vs. Time waveform.

<Program>

DSPL SETCOM
MEASOBJ DNLNK
DSPL MODANAL
TRFORM CDVSTM
TRVIEW_MOD CDVSTM
ZOOM_MOD IN
ZOOM_MOD?

<Response>

IN

ZOOM_RFPWR

■ Function

Zoom for Transmitter Power (TPC)

Sets zoom-in or zoom-out of Zoom Marker portion when Measure Method is set to TPC at Transmitter Power screen.

■ Syntax

Program Message	Query Message	Response Message
ZOOM_RFPWR *a*	ZOOM_RFPWR?	*a*

■ Parameter

Value of a

Expansion display setting

Range	Expansion display Setting	Initial Value
IN	Expands and displays Zoom Marker portion.	
OUT	Displays whole waveform	*

■ Restrictions

- This setting is possible only when Measure Method is set to TPC and Trace View is set to Total Waveform (*cf.* DSPL, TRVIEW_RFPWR).
- This command can be used only when the using measurement system is MX860x01B/MX268x01B.

■ Initialization command

PRE, INI, IP, *RST

■ Use example

Expands and displays Total Waveform.

<Program>

DSPL RFPWR,TPC

TRVIEW_RFPWR TOTAL

ZOOM_RFPWR IN

ZOOM_RFPWR?

<Response>

IN

Commands Having Dependency on Measurement Screen

The program messages for the commands listed below can only be transmitted on certain measurement screens.

The exception to this is Query Message, which essentially can be transmitted on all measurement screens.

For commands with restrictions other than those related to the measurement screen, such restrictions must be cleared.

Command	Set Item	Transmittable Measurement Screen
TERM	Terminal	Setup Common Parameter
IQINZ	Impedance	Setup Common Parameter
MEASOBJ	Measuring Object	Setup Common Parameter
FILTER	Filter	Setup Common Parameter
CODESYNC	Scrambling Code Synchronization	Setup Common Parameter
UPCODESYNC	Scrambling Code Synchronization	Setup Common Parameter
CODENO	Scrambling Code Number	Setup Common Parameter
SFMD	Setup Common Parameter	Setup Common Parameter
SF	Spreading Factor	Setup Common Parameter
SFDPDCH	Spreading Factor for DPDCH	Setup Common Parameter
SFDPCH	Spreading Factor for DPCH	Setup Common Parameter
TRG	Trigger	Setup Common Parameter, Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Demodulaiton Data, IQLevel
TRGEDGE	Trigger Edge	Setup Common Parameter, Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Demodulaiton Data IQLevel
TRGDLY	Trigger Delay	Setup Common Parameter, Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Demodulaiton Data IQLevel

Command	Set Item	Transmittable Measurement Screen
ADJRNG	Adjust Range	Modulation Analysis, Transmitter Power Occupied Bandwidth Adjacent Channel Power, Spurious Emission Demodulaiton Data Power Meter
PWRCAL	Powre Calibration	Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Spurious Emission Demodulaiton Data
CALCANCEL	Calibration Cancel	Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Spurious Emission, Demodulaiton Data
CALVAL	Calibration Value	Setup Common Parameter, Modulation Analysis, Transmitter Power, Occupied Bandwidth Adjacent Channel Power, Spurious Emission, Demodulaiton Data, Power Meter
ZEROSET	Zero Set	Power Meter
ZAJ	Zero Set	Power Meter
RNG	Range	Power Meter
RNG1	Range	Power Meter
RNG2	Range	Power Meter
RNG3	Range	Power Meter
RNG4	Range	Power Meter
RNG5	Range	Power Meter
SETREL	Set Relative	Power Meter