MX269012A
W-CDMA/HSPA Uplink Measurement Software Operation Manual Operation

Eighth 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 MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation), MS2830A Signal Analyzer Operation Manual (Mainframe Operation), or MS2850A Signal Analyzer Operation Manual (Mainframe Operation). Please also refer to them before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3060AE-8.0

Safety Symbols

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⚠ 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

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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.

MX269012A
W-CDMA/HSPA Uplink Measurement Software
Operation Manual Operation

30 January 2008 (First Edition)
30 September 2017 (Eighth Edition)

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Revision History:

February 29th, 2020

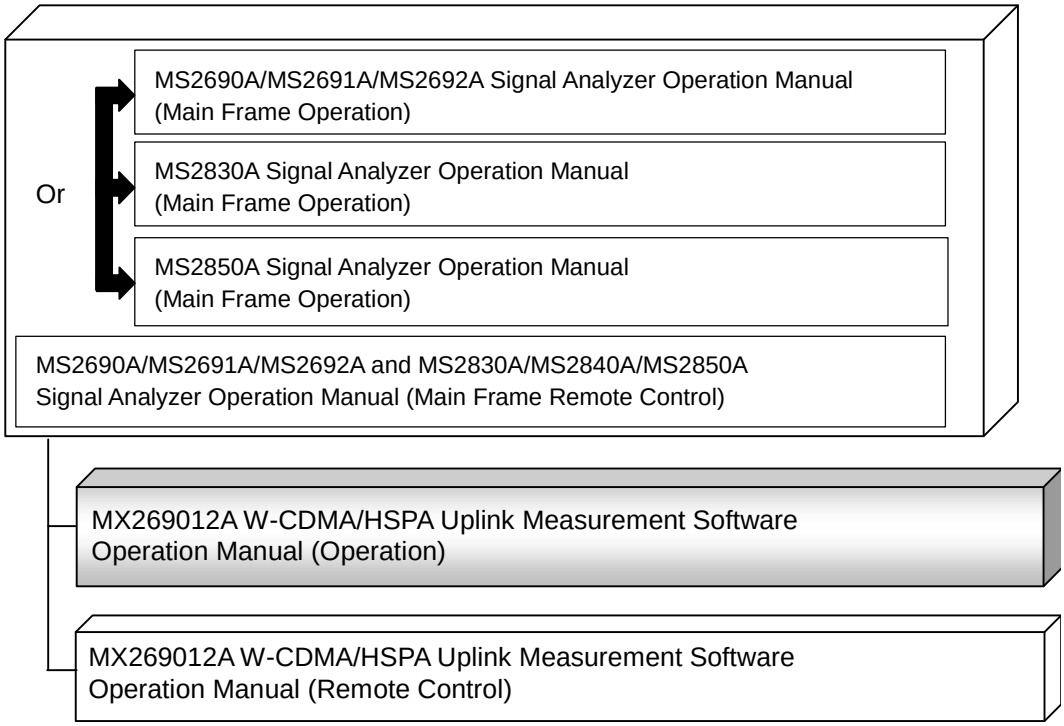
Cautions Against Computer Virus Infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB flash drive or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.
- Protection against malware (malicious software such as viruses).
  This equipment runs on Windows Operating System.
  To connect this equipment to network, the following is advised.
  - Activate Firewall.
  - Install important updates of Windows.
  - Use antivirus software.

About This Manual

■ Organization of Operation Manuals

The operation manuals for the MX269012A W-CDMA/HSPA Uplink Measurement Software are organized as shown below.



- Mainframe Operation
- Mainframe Remote Control

These manuals describe the basic operating methods, maintenance procedures, common functions, and common remote control of the signal analyzer mainframe.

- MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Operation) <This document>

This manual describes the operating methods of the MX269012A W-CDMA/HSPA Uplink Software.

- MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Remote Control)

This manual describes remote control of the MX269012A W-CDMA/HSPA Uplink Measurement Software.

Convention Used in This Manual

Throughout this document, the use of MS269x Series is assumed unless otherwise specified. If using MS2830A or MS2850A, change MS269xA to read MS2830A or MS2850A.

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IV.

Chapter 1 Overview

This chapter provides an overview of the MX269012A W-CDMA/HSPA Uplink Measurement Software and describes the product configuration.

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1.1 Product Overview

The MS269x Series, MS2830A, or MS2850A Signal Analyzer enables high-speed, high-accuracy, and simple measurements of transmission characteristics of base stations and mobile stations for various types of mobile communications. The MS2690A/MS2691A/MS2692A or MS2830A is equipped with high-performance signal analyzer and spectrum analyzer functions as standard, with optional measurement software allowing modulation analysis functionality supporting various digital modulation modes.

The MX269012A W-CDMA/HSPA Uplink Measurement Software (hereinafter referred to as "MX269012A") is a software option for measuring the RF characteristics of W-CDMA/HSPA (FDD) uplink specified by 3GPP.

The MX269012A provides the following measurement features.

- Modulation accuracy measurement
- Carrier frequency measurement
- Transmitter power measurement
- Code domain measurement

MS2830A-006/106 is required to use the MX269012A on MS2830A.

1.2 Product Configuration

1.2.1 Standard configuration

Table 1.2.1-1 lists the standard configuration of the MX269012A.

Table 1.2.1-1 Standard configuration

Item	Model Name/Symbol	Product Name	Q'ty	Remarks
Application	MX269012A	W-CDMA/HSPA Uplink Measurement Software	1	
Accessory	—	Installation CD-ROM	1	Application software, operation manual CD-ROM

1.2.2 Applicable parts

Table 1.2.2-1 lists the applicable parts for the MX269012A.

Table 1.2.2-1 Applicable parts

Model Name/Symbol	Product Name	Remarks
W3060AE	MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Operation)	English, printed version
W3061AE	MX269012A W-CDMA/HSPA Uplink Measurement Software Operation Manual (Remote Control)	English, Printed Version

1.3 Specifications

Table 1.3-1 lists the specifications for the MX269012A.

When MS2830A or MS2850A is used, this software's specification is specified by the condition below, unless otherwise noted.

Attenuator Mode: Mechanical Atten Only

Table 1.3-1 Specifications

Item	Specification
Common Specifications	
Channel bandwidth	5 MHz
Target signal	Uplink
Modulation/Frequency Measurement	
Measurement frequency ranges	400 to 3000 MHz

Table 1.3-1 Specifications (Continued)

Measurement level range	–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) –30 to +10 dBm (at Pre-Amp On)
Carrier frequency measurement accuracy	After CAL execution at 18 to 28°C For a signal of EVM = 1% MS269x Series : ± (accuracy of reference crystal oscillator × carrier frequency + 5 Hz) MS2830A : ± (accuracy of reference crystal oscillator × carrier frequency + 6 Hz) MS2850A : ± (accuracy of reference crystal oscillator × carrier frequency + 6 Hz)
Residual EVM	After CAL execution at 18 to 28°C, the signal measured is within the measurement level range and less than or equal to Input Level. MS269x Series : ≤1.0% (rms) MS2830A : ≤1.2% (rms) MS2850A : ≤1.2% (rms)
Transmitter power measurement accuracy	After CAL execution, input attenuator ≥ 10 dB, at 18 to 28°C, the signal measured is within the measurement level range and less than or equal to Input Level. MS269x Series ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) ±1.1 dB (at Pre-Amp On) MS2830A ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) MS2850A ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) Transmitter power measurement accuracy is calculated from an RSS (root summed square) error of the absolute amplitude accuracy and the in-band frequency characteristics.
Code Domain Measurement	
Code domain power measurement Accuracy	After CAL execution, input at 18 to 28°C, the signal measured is within the measurement level range and less than or equal to Input Level. MS269x Series : ±0.02 dB (code power ≥ –10 dBc) ±0.05 dB (code power ≥ –20 dBc) ±0.10 dB (code power ≥ –30 dBc) MS2830A : ±0.02 dB (Code Power ≥–10 dBc) ±0.10 dB (Code Power ≥–20 dBc) ±0.15 dB (Code Power ≥–30 dBc) MS2850A : ±0.02 dB (Code Power ≥–10 dBc) ±0.10 dB (Code Power ≥–20 dBc) ±0.15 dB (Code Power ≥–30 dBc)
Residual code domain error	MS269x Series : ≤–46 dB MS2830A : ≤–42 dB MS2850A : ≤–42 dB
Code domain error measurement accuracy	±0.3 dB (for code domain error of –30 dBc) ±1.0 dB (for code domain error of –40 dBc)

Table 1.3-1 Specifications (Continued)

Adjacent Channel Power Measurement	
Measurement method	Execution of the adjacent channel power measurement function of the Spectrum Analyzer or Signal Analyzer
Occupied Bandwidth Measurement	
Measurement method	Execution of the occupied bandwidth measurement function of the Spectrum Analyzer or Signal Analyzer
Channel Power Measurement	
Measurement method	Execution of the channel power measurement function of the Spectrum Analyzer or Signal Analyzer
Spectrum Emission Mask Measurement	
Measurement method	Execution of the spectrum emission mask measurement function of the Spectrum Analyzer

Chapter 2 Preparation

This chapter describes the preparations required for using the application you are using. Refer to the *MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)*, *MS2830A Signal Analyzer Operation Manual (Mainframe Operation)* or *MS2850A Signal Analyzer Operation Manual (Mainframe Operation)* for common features not included in this manual.

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2.1 Part Names

This section describes the panel keys for operating the instrument and connectors used to connect external devices. For general points of caution, refer to the *MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)*, *MS2830A Signal Analyzer Operation Manual (Mainframe Operation)* or *MS2850A Signal Analyzer Operation Manual (Mainframe Operation)*.

2.1.1 Front panel

This section describes the front-panel keys and connectors.

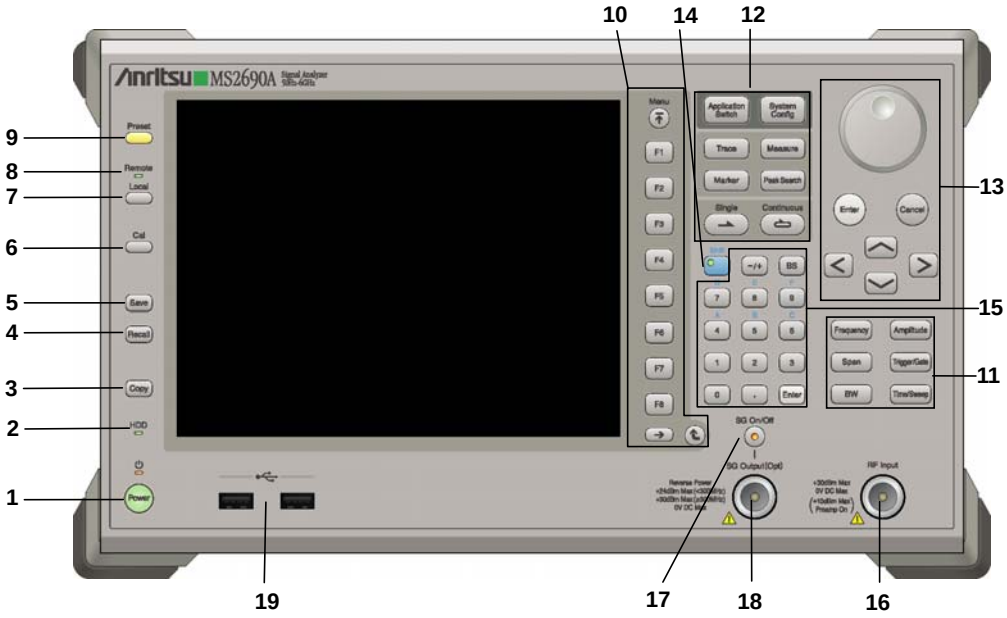


Figure 2.1.1-1 MS269x series front panel

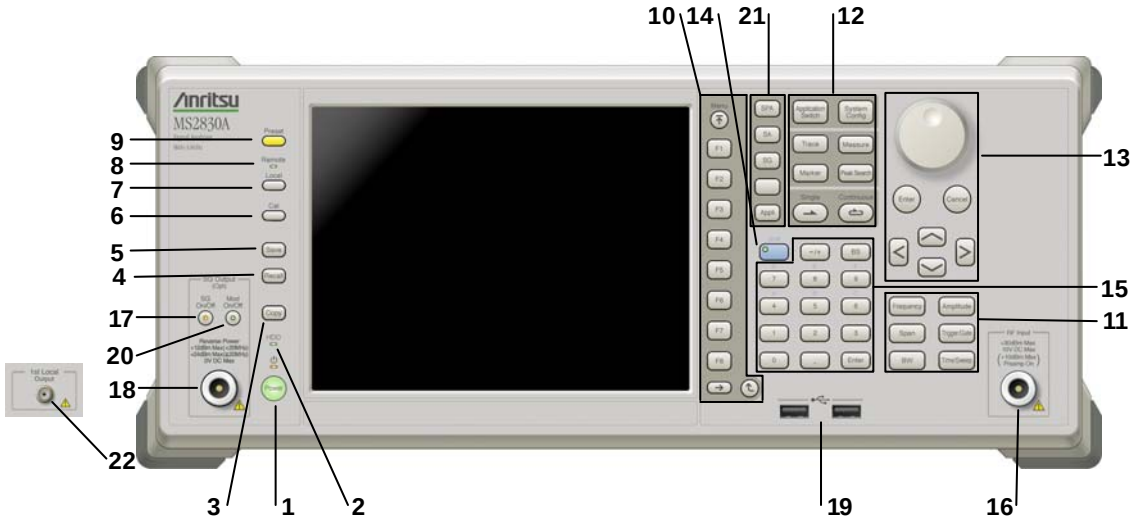


Figure 2.1.1-2 MS2830A/MS2850A front panel (MS2830A Example)

1

Power Switch

Press to switch between the standby state (AC power supplied) and power-on state. The Power lamp lights orange at Standby and green at Power On. Press the power switch for about 2 seconds.

2

Hard disk access lamp (MS269x series, MS2830A)

Lights up when the internal hard disk is accessed.

SSD access lamp (MS2850A)

Lights up when the internal SSD is accessed .

3

Copy key

Press to capture display screen and save to file.

4

Recall key

Press to recall parameter file.

5

Save key

Press to save parameter file.

6

Cal key

Press to display the Calibration menu.

7

Local key

Press to return to local operation from remote control via GPIB, Ethernet, or USB (B), and enable panel settings.

8

Remote lamp

Lights when in remote-control state.

9

Preset key

Resets parameters to initial settings.

10

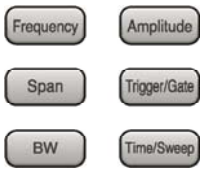
Function keys

Selects or configures function menu displayed on the right of the screen. The function menu is provided in multiple pages and layers.

Press → to fetch next function menu page. The current page number is displayed at the bottom of the function menu, as in “1 of 2”.

Sub-menus may be displayed when a function menu is pressed. Press ↩ to go back to the previous menu. Press Menu to go back to the top menu.

11



Main function keys 1

Press to set or execute main functions.

Executable functions vary with the current application. When nothing happens with the press, it indicates that the application in use does not support the key.

Frequency Press to set frequency parameters.

Amplitude Press to set level parameters.

Span No function is assigned to this key.

Trigger/Gate Press to set trigger parameters.

BW No function is assigned to this key.

Time/Sweep Press to set measurement item parameters.

12

Main function keys 2

Press to set or execute main functions.

Executable functions vary with the current application. When nothing happens with the press, it indicates that the application in use does not support the key.

Application Switch Press to switch application.

System Config Press to display Configuration screen.

Trace Press to set the trace items or to switch the operation window.

Measure Press to set measurement item parameters.

Marker Use when switching graph marker operation.

Peak Search Press to set parameters related to the peak search function.

Single Press to start single measurement.

Continuous Press to start continuous measurements.

13

Rotary knob/Cursor key/Enter key/Cancel key

The rotary knob and cursor keys select display items or change settings.

Press Enter to set the entered or selected data.

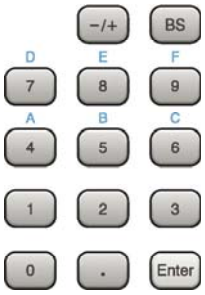
Press Cancel to cancel input or selected data.

14

Shift key

Operates keys with functions in blue characters on panel. Press the Shift key so the key lamp is green and then press the target key.

15



Numeric keypad

Enters numbers on parameter setup screens.

Press BS to delete the last entered digit or character.

[A] to [F] can be entered by pressing keys 4 to 9 while the Shift key lamp Shift is green.

16 RF Input

RF Input connector

Inputs RF signal. This is an N type input connector.
For the MS2830A with the MS2830A-045 and the MS2850A, a K type input connector is installed.

17 SG On/Off

RF Output Control key (when MS269xA-020/120, MS2830A-020/120/021/121 is installed)

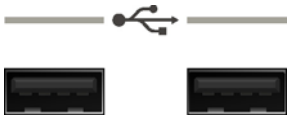
Press SG On/Off to switch on/off the modulation of RF signal when the Vector Signal Generator option is installed. The RF output control key lamp lights orange when the RF signal output is set to On.
This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A.

18 SG Output(Opt)

RF Output connector (when MS269xA-020/120, MS2830A-020/120/021/121 installed)

Outputs RF signal, when the Vector Signal Generator option is installed.
This is an N type output connector.
This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A

19



USB connector (type A)

Connect the accessory USB keyboard, mouse or USB memory.

20

Modulation control key (when MS2830A-020/120/021/121 installed)

Press to switch on/off the modulation of RF signal when the Vector Signal Generator option is installed. The lamp on the key lights up in green in the modulation On state.
This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A.

21

Application key (MS2830A, MS2850A)

Press to switch between applications.

Press to display the Spectrum Analyzer main screen.

Press to display the Signal Analyzer main screen, when MS2830A-005/105/007/006/106/009/109/077/078 or MS2850A are installed.

Press to display the Signal Generator main screen, when Vector Signal Generator option is installed. (MS2830A only)

This is a blank key. Not used. (MS2830A only)

Displays the main screen of the application that is selected using the Application Switch (Auto), or displays that of the pre-selected application (Manual).
For details, refer to 3.5.4 “Changing application layout” in *MS2830A Signal Analyzer Operation Manual (Mainframe Operation) or MS2850A Signal Analyzer Operation Manual (Mainframe Operation)*.

22

1st Local Output connector (MS2830A), (MS2850A: Future extensions)
This is installed with the MS2830A-044/045.
Supplies local signal and bias current to the external mixer, and receives the IF signal with its frequency converted.

2.1.2 Rear panel

This section describes the rear-panel connectors.

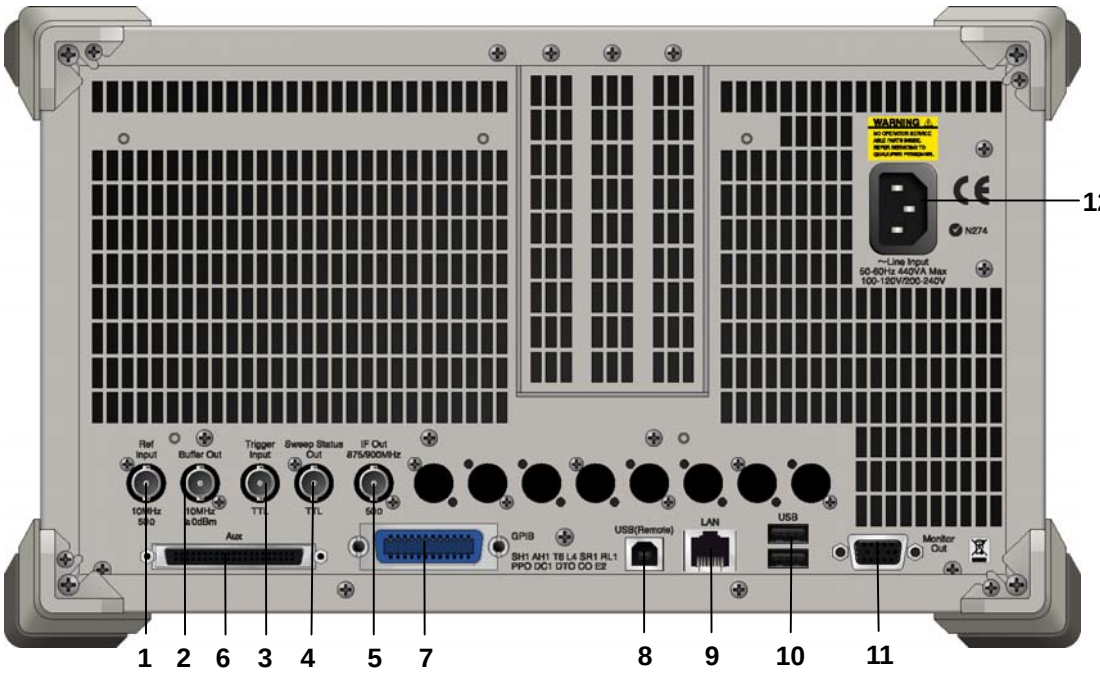


Figure 2.1.2-1 MS269x series rear panel

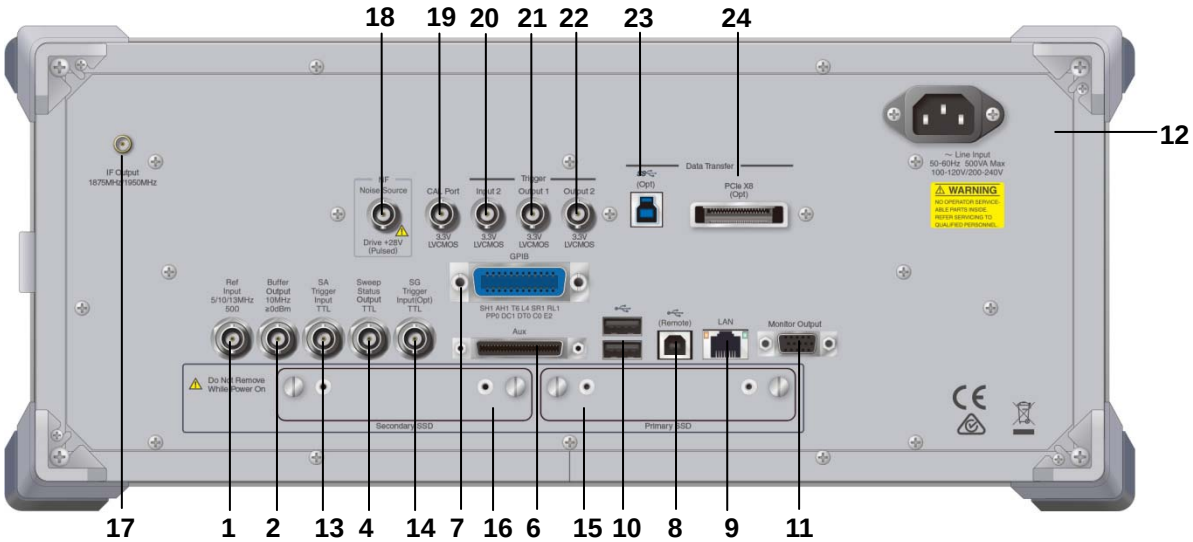


Figure 2.1.2-2 MS2830A/MS2850A rear panel (MS2850A Example)

1

Ref Input connector (reference frequency signal input connector)

Inputs external reference frequency signal. It is for inputting reference frequency signals with higher accuracy than the instrument's internal reference signal, or for synchronizing the frequency of the MS2690A/MS2691A/MS2692A or MS2830A, MS2850A to that of other equipment. The following frequencies are supported:

MS269x series: 10 MHz/13 MHz
MS2830A, MS2850A: 5 MHz/10 MHz/13 MHz

2

Buffer Out connector (reference frequency signal output connector)

Outputs the internal reference frequency signal (10 MHz). It is for synchronizing frequencies between other equipment and the MS2690A/MS2691A/MS2692A or MS2830A, MS2850A.

3

Trigger Input connector (MS269x series only)

Inputs trigger signal from external device.

4

Sweep Status Out connector

Outputs signal when internal measurement is performed or measurement data is obtained.

5

IF Out connector (MS269x series only)

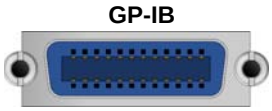
Not used.

6

AUX connector

Not used.

7



GPIB connector

For external control via GPIB.

8 USB(Remote)

USB connector (type B)
For external control via USB.

9 LAN

Ethernet connector
Connects PC or Ethernet network.

10 USB

USB connector (type A)
Used to connect a USB keyboard or mouse or the USB memory supplied.

11 **Monitor Out**

Monitor Out connector
Connects external display.

12

AC inlet
Supplies power.

13

SA Trigger Input connector (MS2830A, MS2850A)
This is a BNC connector for inputting external trigger signal (TTL) for SPA and SA applications.

14

SG Trigger Input connector (MS2830A)
This is a BNC connector for inputting external trigger signal (TTL) for Vector Signal Generator option.

15	**HDD** or **Primary HDD/SSD**	HDD slot (MS2830A) SSD slot (MS2850A)	This is a standard HDD slot. This is a standard SSD slot.
16	**HDD(Opt)** or **Secondary HDD/SSD**	HDD slot for Option (MS2830A) SSD slot (MS2850A)	This is a HDD slot for the options. This is a SSD slot for the options.

17

IF output connector (MS2830A, MS2850A)
This is installed with the MS2830A-044/045 or on the MS2850A.
Monitor output of the internal IF signal.

18

Noise Source connector
Supply (+28 V) of the Noise Source Drive.
This is available when the Option 017/117 is installed.

19

CAL Port connector (Future extensions) (MS2850A)

20

Trigger Input 2 connector (MS2850A)
Input the trigger signal (3.3 V LVCMOS) for SPA and SA applications.

21

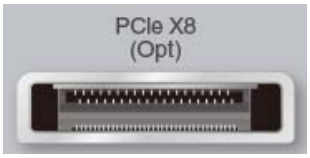
Trigger Output 1 connector (MS2850A)
Output the trigger signal (3.3 V LVCMOS).

22

Trigger Output 2 connector (MS2850A)
Output the trigger signal (3.3 V LVCMOS).

23

USB 3.0 connector (Future extensions) (MS2850A)

24 

PCIe X8 connector (Future extensions) (MS2850A)

2.2 Signal Path Setup

As shown in Figure 2.2-1, connect the instrument and the DUT using an RF cable, so that the signal to be tested is input to the RF Input connector. To prevent an excessive level signal from being input, do not input the signal before setting the input level using this application.

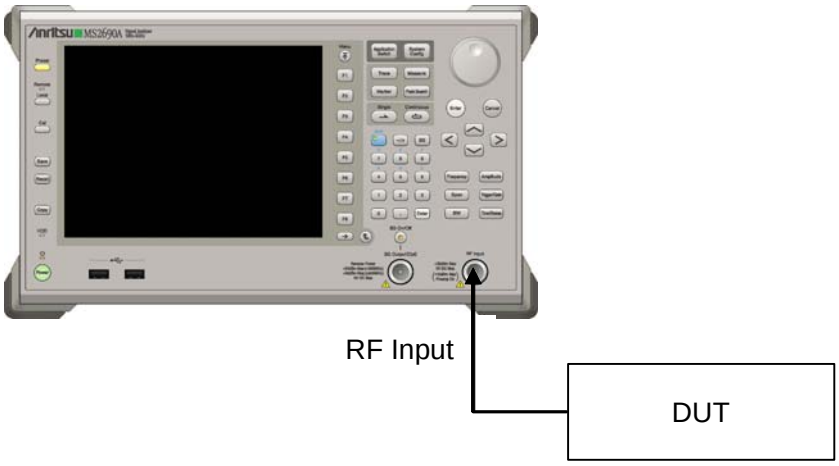


Figure 2.2-1 Signal path setup example

Set the reference signal and/or trigger signal paths from external sources, as required.

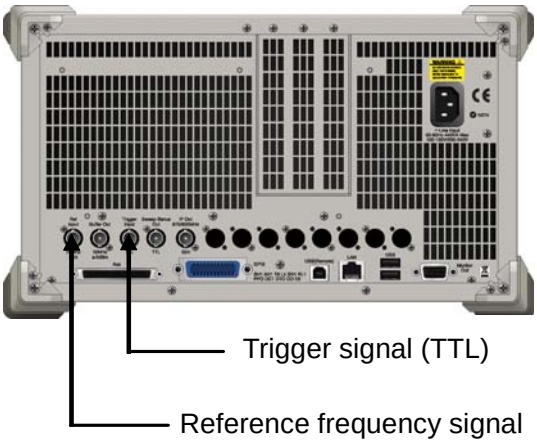


Figure 2.2-2 External signal input

2.3 Application Startup and Selection

To use this application, it is necessary to load (start up) and select the application.

2.3.1 Launching application

The application startup procedure is described below.

Note:

The XXX indicates the application name currently in use.

<Procedure>

1. Press System Config to display the Configuration screen.
2. Press F4 (Application Switch Settings) to display the Application Switch Registration screen.
3. Press F1 (Load Application Select), and move the cursor to "XXX" in the **Unloaded Applications** list.
   If "XXX" is displayed in the **Loaded Applications** list, this means that the application is already loaded.
   If "XXX" appears in neither the **Loaded Applications** nor **Unloaded Applications** list, this means that the application has not been installed.
4. Press F7 (Set) to load the application. If "XXX" is displayed in the **Loaded Applications** list, this means that the application is already loaded.

2.3.2 Selecting application

The selection procedure is described below.

<Procedure>

1. Press Application Switch to display the Application Switch menu.
2. Press the menu function key displaying "XXX".

The application can also be selected with mouse, by clicking "XXX" on the task bar.

2.4 Initialization and Calibration

This section describes the parameter settings and the preparations required before starting measurement.

2.4.1 Initialization

After selecting this application, first perform initialization. Initialization returns the settable parameters to their default value in order to clear the measurement status and measurement results.

Note:

When another software application is switched to or this application is unloaded (ended), the application keeps the parameter settings at that time. The parameter values that were last set will be applied when this application is selected next time.

The initialization procedure is as follows.

<Procedure>

1. Press Preset to display the Preset function menu.
2. Press F1 (Preset).

2.4.2 Calibration

Perform calibration before performing measurement. Calibration sets the level accuracy frequency characteristics for the input level to flat, and adjusts level accuracy deviation caused by internal temperature fluctuations. Calibration should be performed when first performing measurement after turning on power, or if beginning measurement when there is a difference in ambient temperature from the last time calibration was performed.

<Procedure>

1. Press Cal to display the Application Cal function menu.
2. Press F1 (SIGANA All).

For details on calibration functionality only executable with this instrument, refer to the *MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation), MS2830A Signal Analyzer Operation Manual (Mainframe Operation)*or *MS2850A Signal Analyzer Operation Manual (Mainframe Operation)*.

Chapter 3 Measurement

This chapter describes the measurement function, the parameter contents and the setting methods for the MX269012A.

3.1 Basic Operation 3-2
3.1.1 Screen layout 3-2
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3.1 Basic Operation

3.1.1 Screen layout

This section describes the screen layout of the MX269012A.

Figure 3.1.1-1 Screen Layout (Modulation Analysis)

[1] Measurement parameter
Displays parameters.

[2] Status message
Displays the status of signals.

[3] Upper Graph window
Displays a graph of measurement results.

[4] Result window
Displays the numerical values of measurement results.

[5] Function menu
Displays the functions executable with function keys.

[6] Lower Graph window
Displays a graph of measurement results.

3.1.2 Function menu

This section describes the main function menu on the main screen.

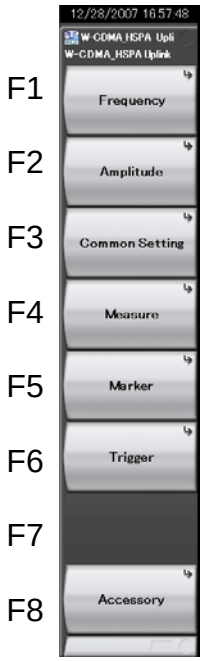

Figure 3.1.2-1 Main function menu

Table 3.1.2-1 Main function menu

Menu Display	Function
Frequency	Sets a frequency ☞ 3.2 "Setting Frequency"
Amplitude	Sets level. ☞ 3.3 "Setting Level"
Common Setting	Sets common items. ☞ 3.4 "Setting Common Items"
Measure	Sets measurement items. ☞ 3.5 "Setting Measurement Items"
Marker	Sets a marker. ☞ 3.6.5 "Setting Maker (Modulation Analysis)" ☞ 3.7.7 "Setting Maker (Code Domain Analysis)"
Trigger	Sets a trigger. ☞ 3.8 "Setting Trigger"
Accessory	Sets other functions. ☞ 5.1 "Selecting Other Functions"

3.1.3 Performing measurement

There are two measurement modes: single and continuous. Measurement is performed once in the single measurement mode, and continuously in the continuous measurement mode.

Single

The selected measurement items are measured only for the measurement count (Storage Count) before measurement is stopped.

<Procedure>

1. Press .

Continuous

The selected measurement items are continuously measured for the measurement count (Storage Count). Measurement will continue even if parameters are changed or the window display is changed. Measurement stops if other applications are selected.

<Procedure>

1. Press .

3.2 Setting Frequency

Perform the frequency settings. Pressing F1 (Frequency) on the main function menu displays the Frequency function menu. Pressing Frequency displays the Frequency function menu and opens the Carrier Frequency dialog box.

Carrier Frequency

■ Summary

Sets a carrier frequency.

■ Setting range

100 MHz to the upper limit of the main unit

3.3 Setting Level

Perform the level settings. Pressing F2 (Amplitude) on the main function menu displays the Amplitude function menu. Pressing Amplitude displays the Amplitude function menu and opens the Input Level dialog box.

Input Level

■ Summary

Sets the input level from the target DUT.

■ Setting range

For Pre-Amp: On :
(–80.00 + Offset Value) to (10.00 + Offset Value) dBm
For Pre-Amp: Off:
(–60.00 + Offset Value) to (30.00 + Offset Value) dBm

Pre-Amp

■ Summary

Toggles the Pre-Amp function between On and Off.

■ Selection options

On	Enables the Pre-Amp function.
Off	Disables the Pre-Amp function.

Offset

■ Summary

Toggles the Offset function between On and Off.

■ Selection options

On	Enables the offset function.
Off	Disables the offset function.

Offset Value

■ Summary

Sets the level offset coefficient.

■ Setting range

–99.99 to + 99.99 dB

■ Setting example

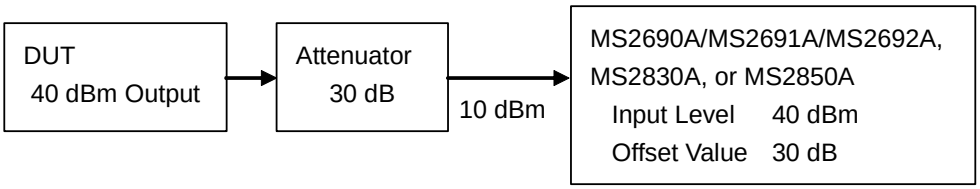

Figure 3.3-1 Input level and offset level setting example

3.4 Setting Common Items

Perform the settings for the common items. Pressing F3 (Common Setting) on the main function menu displays the Common Setting function menu.

Scrambling Code

■ Summary

Sets the scrambling code used for the measured signal.

■ Setting range

000000 to FFFFFF

Transient Periods

■ Summary

Specifies whether to include the transient period in the measurement. The transient period is specified in 3GPP TS34.121 as 25 μs before and after slot boundary.

■ Selection options

Incl.	Includes transient period in the measurement.
Excl.	Excludes transient period in the measurement.

Origin Offset

■ Summary

Specifies whether to include the origin offset in the EVM measurement.

■ Selection options

Incl.	Calculates EVM, including the origin offset.
Excl.	Calculates EVM, excluding the origin offset.

Active Code Threshold

■ Summary

Sets the threshold to identify the code as the active code.

■ Setting range

–40.00 to –10.00 dB

3.5 Setting Measurement Items

Sets measurement items. Pressing F4 (Measure) on the main function menu or Measure displays the Measure function menu.

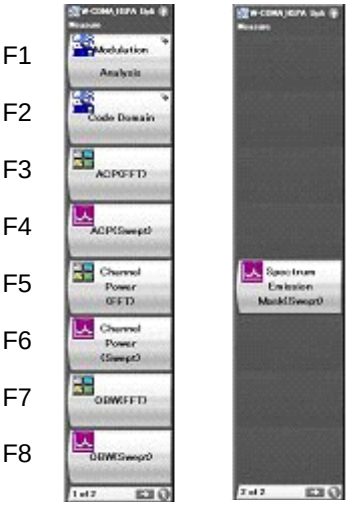

Figure 3.5-1 Measure function menu

Table 3.5-1 Measure function menu

Menu Display	Function
Modulation Analysis	Selects modulation analysis. ☞ 3.6 Modulation Analysis
Code Domain	Selects code domain analysis. ☞ 3.7 Code Domain Analysis
ACP (FFT)	Selects adjacent channel power in Signal Analyzer function. ☞ 3.5.1 Adjacent Channel Power Measurement (ACP)
ACP (Swept)	Selects adjacent channel power in Spectrum Analyzer function. ☞ 3.5.1 Adjacent Channel Power Measurement (ACP)
Channel Power (FFT)	Selects channel power measurement in Signal Analyzer function. ☞ 3.5.2 Channel Power Measurement
Channel Power (Swept)	Selects channel power measurement in Spectrum Analyzer function. ☞ 3.5.2 Channel Power Measurement
OBW (FFT)	Selects occupied bandwidth measurement in Signal Analyzer function. ☞ 3.5.3 Occupied Bandwidth Measurement (OBW)
OBW (Swept)	Selects occupied bandwidth measurement in Spectrum Analyzer function. ☞ 3.5.3 Occupied Bandwidth Measurement (OBW)
Spectrum Emission Mask (Swept)	Selects spectrum emission mask measurement in Spectrum Analyzer function. ☞ 3.5.4 Spectrum Emission Mask Measurement (SEM)

3.5.1 Adjacent Channel Power Measurement (ACP)

Recalls the ACP function of the Signal Analyzer function or Spectrum Analyzer function. Settings of Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp are automatically reflected to the corresponding parameters. Recall Current Application described in Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Operation Manual (Mainframe Operation)”, “MS2830A Operation Manual (Mainframe Operation)”, or “MS2850A Operation Manual (Mainframe Operation)” cannot be executed when this function is being recalled.

ACP (FFT)

■ Summary

Recalls the ACP function of the Signal Analyzer function and measures the adjacent channel power for the reflected parameter settings.

ACP (Swept)

■ Summary

Recalls the ACP function of the Spectrum Analyzer function and measures the adjacent channel power for the reflected parameter settings.

3.5.2 Channel Power Measurement

Recalls the Channel Power function of the Signal Analyzer function or Spectrum Analyzer function. The Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp settings are automatically reflected to the corresponding parameters. The Recall Current Application described in Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Operation Manual (Mainframe Operation)”, “MS2830A Operation Manual (Mainframe Operation)”, or “MS2850A Operation Manual (Mainframe Operation)” cannot be executed when this function is being recalled. Mean power and RRC filtered mean power can be measured with this function.

Channel Power (FFT)

■ Summary

Recalls the Channel Power function of the Signal Analyzer function and measures the channel power for the reflected parameter settings.

Channel Power (Swept)

■ Summary

Recalls the Channel Power function of the Spectrum Analyzer function and measures the channel power for the reflected parameter settings.

3.5.3 Occupied Bandwidth Measurement (OBW)

Recalls the OBW function of the Signal Analyzer function or Spectrum Analyzer function. Settings of Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp are automatically reflected to the corresponding parameters. Recall Current Application described in Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Operation Manual (Mainframe Operation)”, “MS2830A Operation Manual (Mainframe Operation)”, or “MS2850A Operation Manual (Mainframe Operation)” cannot be executed when this function is being recalled.

OBW (FFT)

■ Summary

Recalls the OBW function of the Signal Analyzer function and measures the occupied bandwidth for the reflected parameter settings.

OBW (Swept)

■ Summary

Recalls the OBW function of the Spectrum Analyzer function and measures the occupied bandwidth for the reflected parameter settings.

3.5.4 Spectrum Emission Mask Measurement (SEM)

Recalls the SEM function of the Spectrum Analyzer function. The Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp settings are automatically reflected to the corresponding parameters. The Recall Current Application described in Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Operation Manual (Mainframe Operation)”, “MS2830A Operation Manual (Mainframe Operation)”, or “MS2850A Operation Manual (Mainframe Operation)” cannot be executed when this function is being recalled.

Spectrum Emission Mask (Swept)

■ Summary

Recalls the SEM function of the Spectrum Analyzer function and measures the spectrum emission mask for the reflected parameter settings.

3.6 Modulation Analysis

Pressing F1 (Modulation Analysis) on the Measure function menu displays the Modulation Analysis function menu.

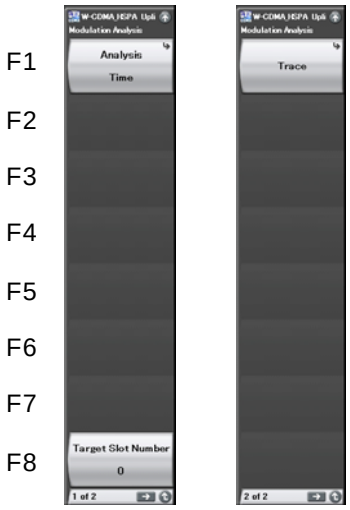

Figure 3.6-1 Modulation Analysis function menu

Table 3.6-1 Modulation Analysis function menu

Menu Display	Function
Analysis Time	Sets analysis period in a single capture. ☞ 3.6.1 Analysis Time
Target Slot Number	Sets slot number of graphical results in the upper and lower Graph window. ☞ 3.6.4 Graphical Results
Trace	Sets values related to the results displayed. ☞ 3.6.2 Trace

3.6.1 Analysis Time

Set the continuous measurement period for analysis with a single capture. Pressing F1 (Analysis Time) on page 1 of the Modulation Analysis function menu or Time/Sweep displays the Analysis Time function menu.

Starting Slot Number

■ Summary

Sets the starting slot number of continuous measurement period.

■ Setting range

0 to 14

Measurement Interval

■ Summary

Sets continuous measurement period in slot.

■ Setting range

1 to (15 – Starting Slot Number)

Example

When 2 is set for the Starting Slot Number and 6 for the Measurement Interval, measurement between slots #2 and #7 is performed.

3.6.2 Trace

Perform the settings related to the graph results. Pressing F1 (Trace) on page 2 of the Modulation Analysis function menu or Trace displays the Trace function menu.

F1
F2
F3
F4
F5
F6
F7
F8

Figure 3.6.2-1 Trace function menu

Table 3.6.2-1 Trace function menu

Menu Display	Function
Trace Mode	Selects a graphical result in the lower Graph window.
Scale	Sets vertical scale of a graphical result.
Storage	Sets number of measurements and displayed format of numerical results.

Trace Mode

■ Summary

Selects a graphical result in the lower Graph window.

■ Selection options

EVM vs Chip — Displays vector error at each chip.

Mag. Error vs Chip — Displays magnitude error at each chip.

Phase Error vs Chip — Displays phase error at each chip.

Scale: Trace Scale

■ Summary

Sets vertical scale of a graphical result.

■ Selection options

For EVM vs Chip

5%	Sets upper limit to 5%.
10%	Sets upper limit to 10%.
20%	Sets upper limit to 20%.
50%	Sets upper limit to 50%.

For Mag. Error vs Chip

±5%	Sets upper and lower limit to ±5%.
±10%	Sets upper and lower limit to ±10%.
±20%	Sets upper and lower limit to ±20%.
±50%	Sets upper and lower limit to ±50%.

For Phase Error vs Chip

±5degree	Sets upper and lower limit to ±5 degrees.
±10degree	Sets upper and lower limit to ±10 degrees.
±20degree	Sets upper and lower limit to ±20 degrees.
±50degree	Sets upper and lower limit to ±50 degrees.

Storage

■ Summary

Sets number of measurements and displayed format of numerical results.

■ Selection options

Mode	Selects displayed format of numerical results.
Count	Sets number of measurements.

Storage:Mode

■ Summary

Selects displayed format of numerical results.

■ Selection options

Off	Displays the numerical results in a single measurement.
Average	Displays the averages of numerical results in specified number of measurements.
Average & Max	Displays the averages and maximums of numerical results in specified number of measurements.

Storage:Count

■ Summary

Sets number of measurements (number of captures). This value is used for selecting Average or Average & Max to Storage:Mode.

■ Setting range

2 to 9999

Example

When 2 is set for Starting Slot Number, 6 for Measurement Interval, Average & Max for Storage:Mode, and 3 for Storage:Count, the measurement between slots #2 and #7 is performed three times and the average and maximum results are displayed.

3.6.3 Numerical Results

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval. The displayed contents differ depending on the Storage Mode setting: analysis results for a single measurement are displayed for Off, the averages of analysis results for the specified number of measurements are displayed for Average, and the average and maximum values of analysis results for the specified number of measurements are displayed for Average & Max. For the analysis results of Mean Power, however, the average, maximum and minimum values are displayed for Average & Max.

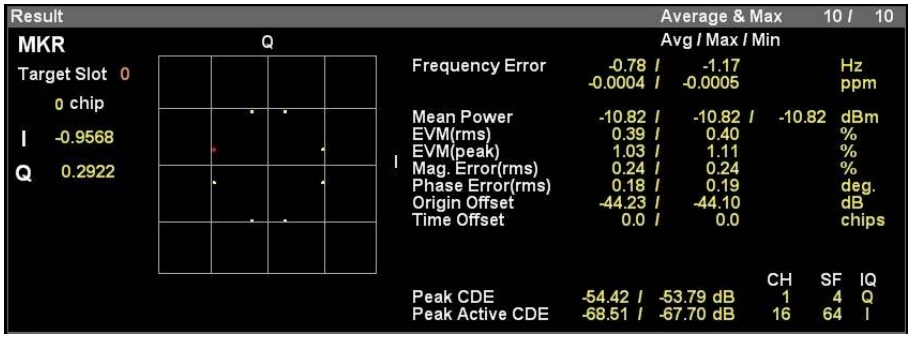

Figure 3.6.3-1 Result window

Frequency Error

■ Summary

Displays frequency error in the analysis time.

Mean Power

■ Summary

Displays mean power in the analysis time.

EVM (rms)

■ Summary

Displays vector error in RMS in the analysis time.

EVM (peak)

■ Summary

Displays peak of vector error in each chip in the analysis time.

Mag. Error (rms)

■ Summary

Displays magnitude error in RMS in the analysis time.

Phase Error (rms)

■ Summary

Displays phase error in RMS in the analysis time.

Origin Offset

■ Summary

Displays origin offset in the analysis time.

Time Offset

■ Summary

Displays time offset between the triggered time and slot boundary of slot#0 of the signal measured. This result is displayed when trigger switch is set to On.

☞ 3.8 Setting Trigger

Peak CDE

■ Summary

Displays peak of code domain error of the codes with spreading factor 4 in analysis time. The code number (CH), spreading factor (SF), and axis (IQ) of the code with peak value are also displayed.

Peak Active CDE

■ Summary

Displays peak of code domain error of the active codes in analysis time. The code number (CH), spreading factor (SF), and axis (IQ) of the active code with peak value are also displayed.

3.6.4 Graphical Results

The upper Graph window and lower Graph window show a graphical result in the analysis time in the last capture, specified with the Starting Slot Number and Measurement Interval. The displayed interval is one slot, and a graphical result of the slot specified with Target Slot Number is displayed.

Target Slot Number

■ Summary

Sets slot number of a graphical result in the Graph window.

■ Setting range

Starting Slot Number to (Starting Slot Number + Measurement Interval – 1)

3.6.1 Analysis Time

Example

When 2 is set for Starting Slot Number and 6 for Measurement Interval, values of 2 to 7 can be set as Target Slot Number.

3.6.4.1 IQ Constellation

The IQ constellation in the slot specified with Target Slot Number is displayed in the upper Graph window. The IQ at the marker-selected chip is displayed in red.

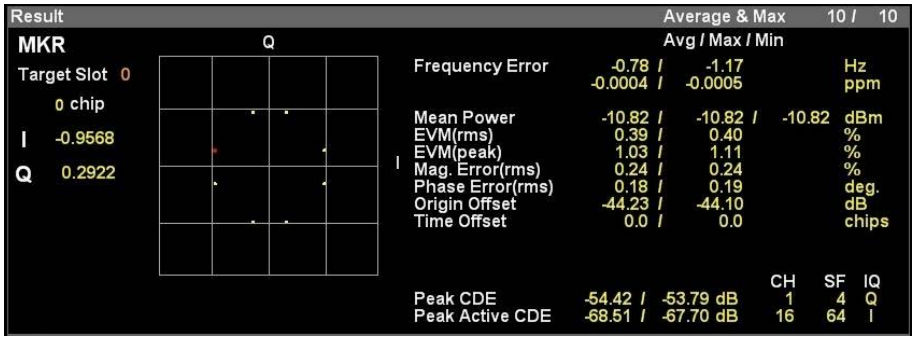

Figure 3.6.4.1-1 IQ Constellation display

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

Chip

■ Summary

Displays chip number specified with Constellation Marker Number.

I/Q

■ Summary

Displays IQ amplitude values at the chip specified with Constellation Marker Number.

3.6.4.2 EVM vs Chip

When EVM vs Chip is set for Trace:Trace Mode, the vector error in the slot specified with Target Slot Number is displayed in the lower Graph window. The vector error at the marker-selected chip is displayed in red.

3.6.2 Trace

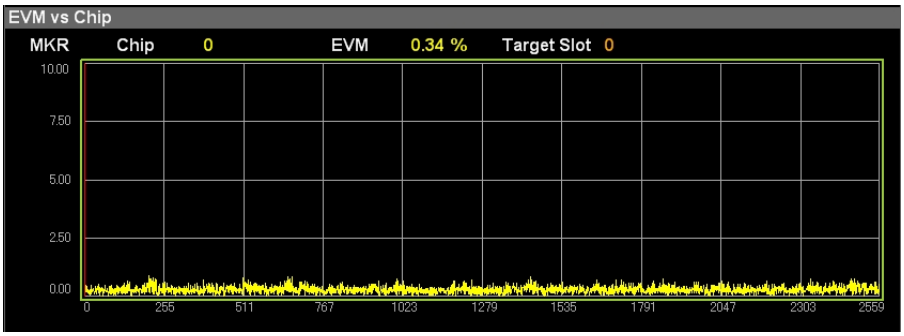

Figure 3.6.4.2-1 EVM vs Chip display

Chip

■ Summary

Displays chip number specified with Bottom Graph Marker Number.

EVM

■ Summary

Displays vector error at the chip specified with Bottom Graph Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.6.4.3 Magnitude Error vs Chip

When Mag. Error vs Chip is set for Trace:Trace Mode, the magnitude error in the slot specified with Target Slot Number is displayed in the lower Graph window. The magnitude error at the marker-selected chip is displayed in red.

3.6.2 Trace

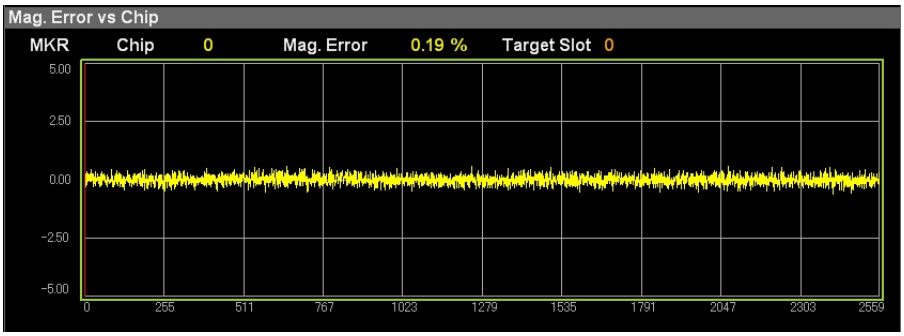

Figure 3.6.4.3-1 Magnitude Error vs Chip display

Chip

■ Summary

Displays chip number specified with Bottom Graph Marker Number.

Mag Error

■ Summary

Displays magnitude error at the chip specified with Bottom Graph Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.6.4.4 Phase Error vs Chip

When Phase Error vs Chip is set for Trace:Trace Mode, the phase error in the slot specified with Target Slot Number is displayed in the lower Graph window. The phase error at the marker-selected chip is displayed in red.

3.6.2 Trace

Figure 3.6.4.4-1 Phase Error vs Chip display

Chip

■ Summary

Displays chip number specified with Bottom Graph Marker Number.

Phase Error

■ Summary

Displays phase error at the chip specified with Bottom Graph Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.6.5 Setting Marker (Modulation Analysis)

Perform the marker-related settings. Pressing F5 (Marker) on the main function menu or Marker displays the Marker function menu.

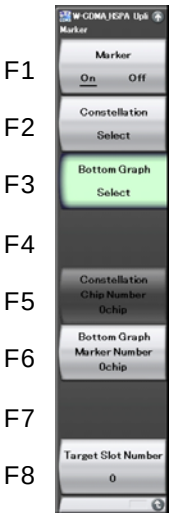

Figure 3.6.5-1 Marker function menu

Table 3.6.5-1 Marker function menu

Menu Display	Function
Marker	Toggles marker function between On and Off.
Constellation Select	Sets target of operation for the rotary knob and the cursor key to Constellation.
Bottom Graph Select	Sets target of operation for the rotary knob and the cursor key to lower Graph window.
Constellation Chip Number	Sets marker position of IQ constellation in chip.
Bottom Graph Marker Number	Sets marker position of lower Graph window with chip number.
Target Slot Number	Displays slot number specified with Target Slot Number.

Marker

■ Summary

Toggles marker function between On and Off.

■ Selection options

On	Enables the marker function.
Off	Disables the marker function.

Constellation Select

■ Summary

Sets target of operation for the rotary knob and the cursor key to Constellation.

Bottom Graph Select

■ Summary

Sets target of operation for the rotary knob and the cursor key to lower Graph window.

Constellation Chip Number

■ Summary

Sets marker position of IQ constellation in chip.
This operation is invalid when Bottom Graph Select is selected.

■ Setting range

0 to 2559

Bottom Graph Marker Number

■ Summary

Sets marker position of lower Graph window with chip number.
This operation is invalid when Constellation Select is selected.

■ Setting range

0 to 2559

Target Slot Number

☞ 3.6.4 Graphical Results

3.7 Code Domain Analysis

Pressing F2 (Code Domain) on the Measure function menu displays the Code Domain function menu.

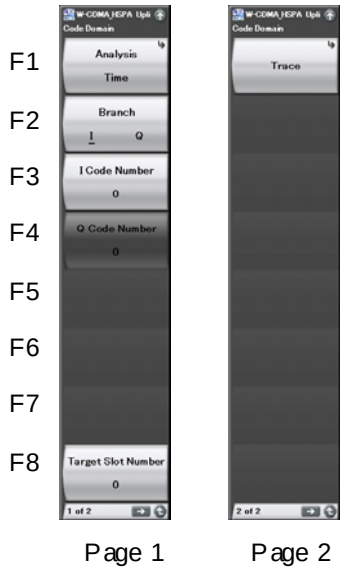

Figure 3.7-1 Code Domain function menu

Table 3.7-1 Code Domain function menu

Menu Display	Function
Analysis Time	Sets analysis period in a single capture. 3.7.1 Analysis Time
Branch	Sets branch analyzed. 3.7.2 Analysis Code
I Code Number	Sets code number of I branch analyzed. 3.7.2 Analysis Code
Q Code Number	Sets code number of Q branch analyzed. 3.7.2 Analysis Code
Target Slot Number	Sets slot number of graphical results on Graph window. 3.7.3 Analysis Slot
Trace	Sets values related to the results displayed. 3.7.4 Trace

3.7.1 Analysis Time

Sets continuous measurement period in a single capture. Pressing F1 (Analysis Time) on page 1 of the Code Domain function menu or Time/Sweep displays the Analysis Time function menu.

Starting Slot Number

■ Summary

Sets starting slot number in continuous measurement period.

■ Setting range

0 to 14

Measurement Interval

■ Summary

Sets continuous measurement period in slot.

■ Setting range

1 to (15 – Starting Slot Number)

Example

When 2 is set for Starting Slot Number and 6 for Measurement Interval, measurement between slots #2 and #7 is performed.

3.7.2 Analysis Code

Set the code branch and code number to be analyzed.

Branch

■ Summary

Toggles the branch to be analyzed between I and Q.

■ Selection options

I	Sets I branch for analysis.
Q	Sets Q branch for analysis.

I Code Number

■ Summary

Sets the code number of I branch to be analyzed. The code number converted to spreading factor 256 should be set. Refer to the example below.

■ Setting range

0 to 255

Q Code Number

■ Summary

Sets the code number of Q branch to be analyzed. The code number converted to spreading factor 256 should be set. Refer to the example below.

■ Setting range

0 to 255

Example

For analysis of active code with spreading factor 64 and code number 64, the value of 64 (16×256/64) should be set as the analysis code number.

3.7.3 Analysis Slot

Set the slot number to be analyzed.

Target Slot Number

■ Summary

Sets the slot number to be analyzed. The numerical results and graphical results specified with Target Slot Number are displayed in the upper and lower Graph window.

☞ 3.7.5 Numerical Results
☞ 3.7.6 Graphical Results

■ Setting range

Starting Slot Number to (Starting Slot Number + Measurement Interval – 1)

☞ 3.6.1 Analysis Time

Example

When 2 is set for Starting Slot Number and 6 for Measurement Interval, values of 2 to 7 can be set as Target Slot Number.

3.7.4 Trace

Sets values related to the results displayed. Pressing F1 (Trace) on page 2 of the Code Domain function menu or Trace displays the Trace function menu.

F1
F2
F3
F4
F5
F6
F7
F8

Figure 3.7.4-1 Trace function menu

Table 3.7.4-1 Trace function menu

Menu Display	Function
Trace Mode	Selects a graphical result in the Graph window.
Scale	Sets vertical scale of a graphical result.

Trace Mode: Code Domain Mode

■ Summary

Selects graphical result in the upper Graph window.

■ Selection options

Power	Displays code domain power result.
Error	Displays code domain error result.

Trace Mode

■ Summary

Selects graphical result in the lower Graph window.

■ Selection options

Constellation	Displays symbol constellation of specified code in specified slot.
EVM vs Symbol	Displays vector error at each symbol of specified code in specified slot.
Mag Error vs Symbol	Displays magnitude error at each symbol of specified code in specified slot.
Code Power vs Symbol	Displays power at each symbol of specified code in specified slot.

Code Power Scale Offset

■ Summary

Sets the shift amount on the vertical scale of the Code Power vs Symbol graph.

■ Selection options

0div	Does not shift.
1div	Shifts by 1 div. div is a unit of one scale of the graph. The shift amount (dB) depends on the setting for the vertical scale of the Code Power vs Symbol graph.

Scale:Code Domain Scale

■ Summary

Sets vertical scale for the graphical result in the upper Graph window.

■ Selection options

For Power selected as Code Domain Mode

20 dB	Sets lower limit to –20 dB.
40 dB	Sets lower limit to –40 dB.
60 dB	Sets lower limit to –60 dB.
80 dB	Sets lower limit to –80 dB.

For Error selected as Code Domain Mode

20 dB	Sets upper limit to –60 dB.
40 dB	Sets upper limit to –40 dB.
60 dB	Sets upper limit to –20 dB.
80 dB	Sets upper limit to 0 dB.

Scale:Trace Scale

■ Summary

Sets vertical scale for the graphical result in the lower Graph window.

■ Selection options

For EVM vs Symbol

5%	Sets upper limit to 5%.
10%	Sets upper limit to 10%.
20%	Sets upper limit to 20%.
50%	Sets upper limit to 50%.

For Mag Error vs Symbol

±5%	Sets the upper and lower limit to ±5%.
±10%	Sets the upper and lower limit to ±10%.
±20%	Sets the upper and lower limit to ±20%.
±50%	Sets the upper and lower limit to ±50%.

For Code Power vs Symbol

When Code Power Scale Offset = 0 div.:

20 dB	Sets scale range from –20 to 0 dB.
40 dB	Sets scale range from –40 to 0 dB.
60 dB	Sets scale range from –60 to 0 dB.
80 dB	Sets scale range from –80 to 0 dB.

When Code Power Scale Offset = 1 div.:

20 dB	Sets scale range from –15 to +5 dB.
40 dB	Sets scale range from –30 to +10 dB.
60 dB	Sets scale range from –45 to +15 dB.
80 dB	Sets scale range from –60 to +20 dB.

3.7.5 Numerical Results

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval.

3.7.1 Analysis Time
3.7.2 Analysis Code
3.7.3 Analysis Slot

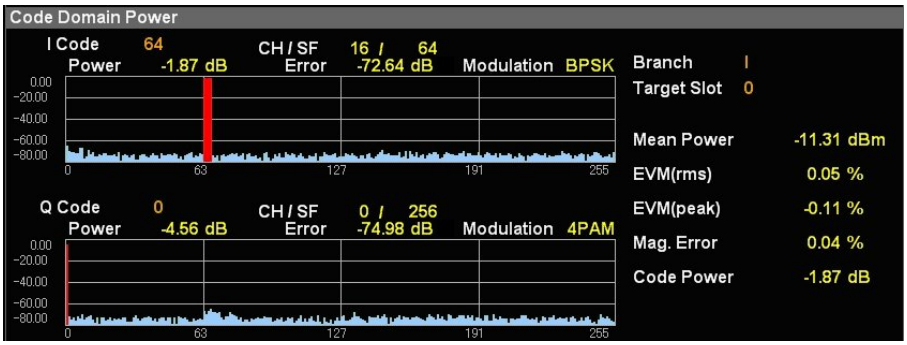

Figure 3.7.5-1 Result window

Branch

■ Summary

Displays branch to be analyzed specified with Branch.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

Mean Power

■ Summary

Displays mean power in the slot specified with Target Slot Number.

EVM (rms)

■ Summary

Displays vector error in RMS of the specified code in the slot specified with Target Slot Number.

EVM (peak)

■ Summary

Displays peak of vector error in each symbol of the specified code in the slot specified with Target Slot Number.

Mag. Error (rms)

■ Summary

Displays magnitude error in RMS of the specified code in the slot specified with Target Slot Number.

Code Power

■ Summary

Displays mean power of the specified code in the slot specified with Target Slot Number.

3.7.6 Graphical Results

The upper Graph window and the lower Graph window shows a graphical result of the slot specified with Target Slot Number in the analysis time, specified with the Starting Slot Number and Measurement Interval.

3.7.1 Analysis Time
3.7.3 Analysis Slot

3.7.6.1 Code Domain Power

When Power is set for Trace:Code Domain Mode, the code domain power in the slot specified with Target Slot Number is displayed in the upper Graph window. The code power at the marker-selected code is displayed in red.

3.7.2 Analysis Code

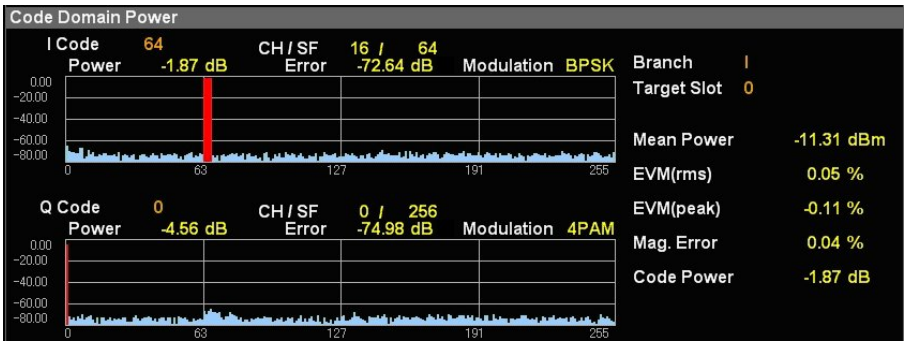

Figure 3.7.6.1-1 Code Domain Power window

I Code

■ Summary

Displays code number specified with I Code Number.

Q Code

■ Summary

Displays code number specified with Q Code Number.

CH / SF

■ Summary

Displays channel code number and spreading factor of the code specified with I Code Number and Q Code Number.

Power

■ Summary

Displays code power of the code specified with I Code Number and Q Code Number.

Modulation

■ Summary

Displays modulation method of the code specified with I Code Number or Q Code Number.

3.7.6.2 Code Domain Error

When Error is set for Trace:Code Domain Mode, the code domain error in the slot specified with Target Slot Number is displayed in the upper Graph window. The code error at the marker-selected code is displayed in red.

3.7.2 Analysis Code

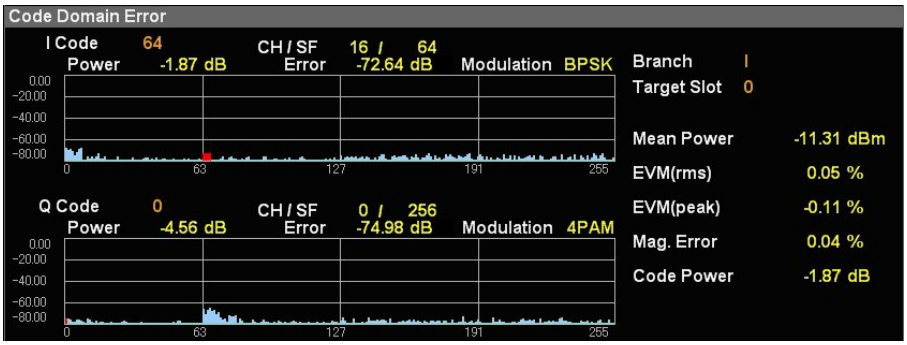

Figure 3.7.6.2-1 Code Domain Error window

I Code

■ Summary

Displays code number specified with I Code Number.

Q Code

■ Summary

Displays code number specified with Q Code Number.

CH / SF

■ Summary

Displays channel code number and spreading factor of the code specified with I Code Number and Q Code Number.

Error

■ Summary

Displays code error of the code specified with I Code Number and Q Code Number.

Modulation

■ Summary

Displays modulation method of the code specified with I Code Number or Q Code Number.

3.7.6.3 Constellation

When Constellation is set for Trace:Trace Mode, The symbol constellation of the code specified with I Code Number or Q Code Number in the slot specified with Target Slot Number is displayed in the lower Graph window. The constellation at the marker-selected symbol is displayed in red.

☞ 3.7.2 Analysis Code
☞ 3.7.7 Setting Marker(Code Domain Analysis)

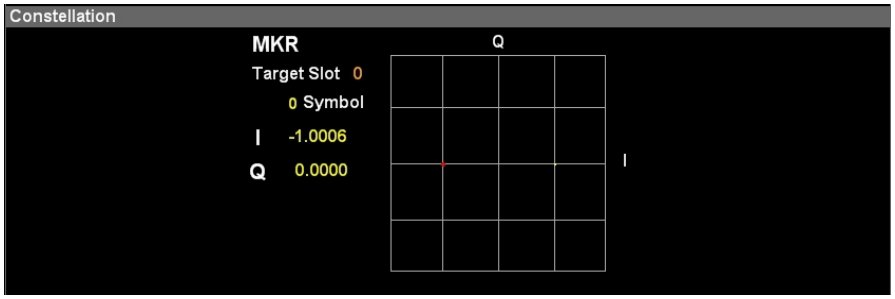

Figure 3.7.6.3-1 Constellation window (I Branch)

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

Symbol

■ Summary

Displays symbol number specified with Marker Number.

I, Q

■ Summary

Displays either I or Q amplitude at the symbol specified with Marker Number.

3.7.6.4 EVM vs Symbol

When EVM vs Symbol is set for Trace:Trace Mode, the vector error of the code specified with I Code Number or Q Code Number in the slot specified with Target Slot Number is displayed in the lower Graph window. The vector error at the marker-selected symbol is displayed in red.

3.7.2 Analysis Code
3.7.7 Setting Marker (Code Domain Analysis)

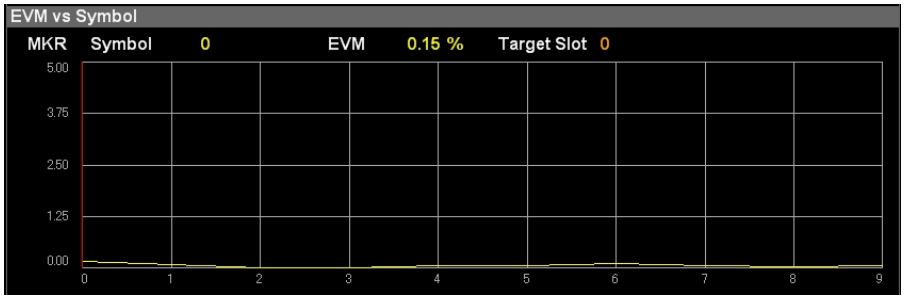

Figure 3.7.6.4-1 EVM vs Symbol window

Symbol

■ Summary

Displays symbol number specified with Marker Number.

EVM

■ Summary

Displays vector error at the symbol specified with Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.7.6.5 Magnitude Error vs Symbol

When Mag. Error is set for Trace:Trace Mode, the magnitude error of the code specified with I Code Number or Q Code Number in the slot specified with Target Slot Number is displayed in the lower Graph window. The magnitude error at the marker-selected symbol is displayed in red.

3.7.2 Analysis Code
3.7.7 Setting Marker (Code Domain Analysis)

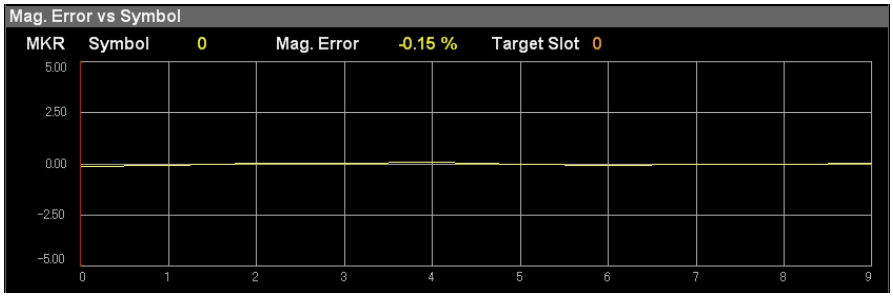

Figure 3.7.6.5-1 Magnitude Error vs Symbol window

Symbol

■ Summary

Displays symbol number specified with Marker Number.

Mag. Error

■ Summary

Displays magnitude error at the symbol specified with Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.7.6.6 Code Power vs Symbol

When Code Power vs Symbol is set for Trace:Trace Mode, the code power of the code specified with I Code Number or Q Code Number in the slot specified with Target Slot Number is displayed in the lower Graph window. The code power at the marker-selected symbol is displayed in red.

☞ 3.7.2 Analysis Code
☞ 3.7.7 Setting Marker (Code Domain Analysis)

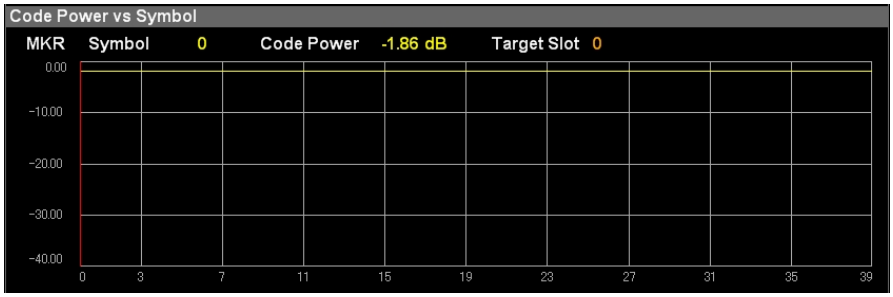

Figure 3.7.6.6-1 Code Power vs Symbol window

Symbol

■ Summary

Displays symbol number specified with Marker Number.

Code Power

■ Summary

Displays code power at the symbol specified with Marker Number.

Target Slot

■ Summary

Displays slot number specified with Target Slot Number.

3.7.7 Setting Marker (Code Domain Analysis)

Perform the marker-related settings. Pressing F5 (Marker) on the main function menu or Marker displays the Marker function menu.

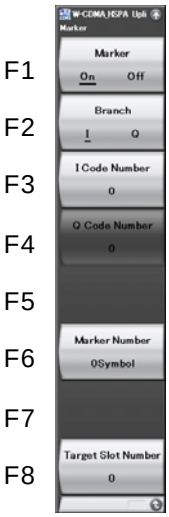

Figure 3.7.7-1 Marker function menu

Marker

■ Summary

Toggles the marker function between On and Off.

■ Selection options

On	Enables the marker function.
Off	Disables the marker function.

Branch

3.7.2 Analysis Code

I Code Number

3.7.2 Analysis Code

Q Code Number

3.7.2 Analysis Code

Marker Number

■ Summary

Sets the marker position in the lower Graph window with a symbol number.

■ Setting range

0 to (2560/SF – 1), where SF is spreading factor.

Target Slot Number

☞ 3.7.3 Analysis Slot

3.8 Setting Trigger

Perform the trigger-related settings. Pressing F6 (Trigger) on the main function menu or Trigger/Gate displays the Trigger function menu.

Trigger Switch

■ Summary

Toggles trigger synchronization between On and Off.

■ Selection options

On	Enables the trigger function.
Off	Disables the trigger function.

Trigger Source

■ Summary

Sets the trigger source.

■ Selection options

External*1	Starts measurement by the trigger input from an external trigger.
External 2*2	Starts measurement by the trigger input from an external trigger 2.
SG Marker	Starts measurement by timing inside the Vector Signal Generator.

*1: External 1 is displayed only for MS2850A.
*2: External 2 is selectable only for MS2850A.

Trigger Slope

■ Summary

Sets the trigger polarity.

■ Selection options

Rise	Synchronizes with rising edge of the trigger.
Fall	Synchronizes with falling edge of the trigger.

Trigger Delay

■ Summary

Sets the trigger delay.

■ Setting range

–2 to +2 s

Chapter 4 Performance Test

This chapter describes the measurement devices, setup methods, and performance test procedures required for performing performance tests as preventive maintenance.

4.1 Overview of Performance Test 4-2
4.1.1 Performance test 4-2
4.2 Performance Test Items 4-3
4.2.1 Testing methods 4-3

4.1 Overview of Performance Test

4.1.1 Performance test

Performance tests are performed as part of preventive maintenance in order to prevent degradation of the performance.

Use performance tests when required for acceptance inspection, routine inspection and performance verification after repairs. Perform items deemed critical at regular intervals as preventive maintenance. Also perform the following performance tests for acceptance inspection, routine inspection and performance verification after repairs.

- Carrier frequency accuracy
- Residual EVM

Perform items deemed critical at regular intervals as preventive maintenance. A recommended cycle for routine tests of once or twice a year is desirable.

If items that do not meet the required level are detected during performance testing, 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.

4.2 Performance Test Items

Warm up the device to be tested and the measuring instruments for at least 30 minutes except if specified otherwise, in order to stabilize them sufficiently before running performance tests. Maximum measurement accuracy requires, in addition to the above, conducting performance tests under ambient temperatures and with little AC power supply voltage fluctuations, as well as the absence of noise, vibrations, dust, humidity and other problems.

4.2.1 Testing methods

(1) Test target standards

- Carrier frequency accuracy
- Residual EVM

(2) Measuring instrument for tests

- Vector signal generator
- Power meter
- 3 dB attenuator × 2

(3) Setup

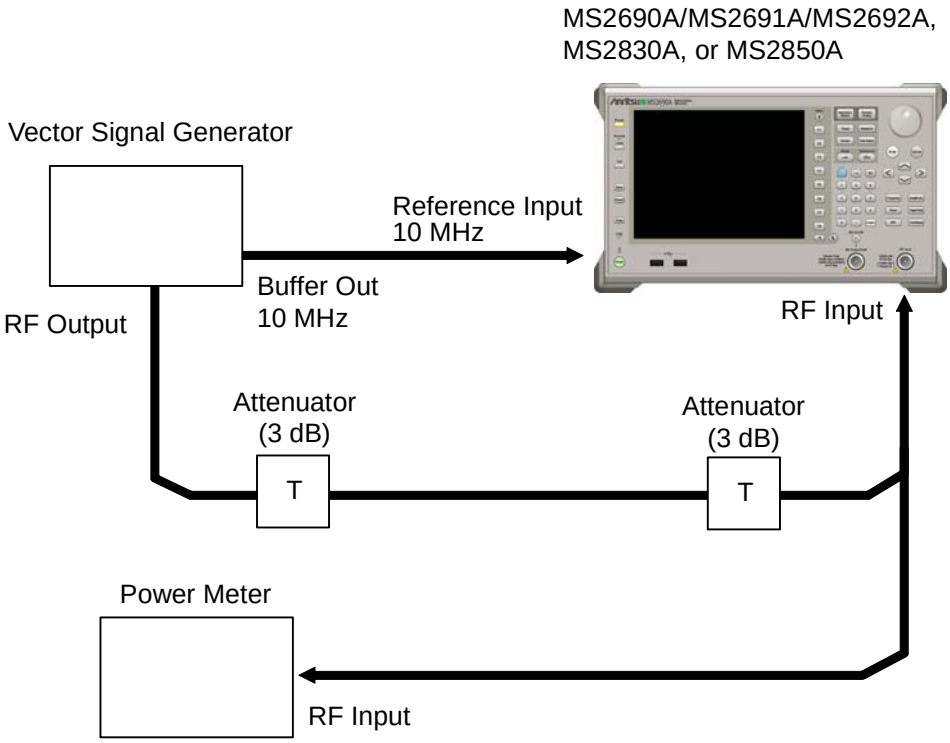

Figure 4.2.1-1 Performance Test

(4) Test procedure

(a) Signal source adjustment

1. Input the 10-MHz reference signal output from the vector signal generator to the Reference Input connector.
2. Output a W-CDMA uplink signal with RMC12.2K from the vector signal generator.
3. Input the vector signal generator output signal into the power meter and measure the power.

(b) Settings of the main unit

1. Turn on the power switch on the front panel and then wait until the internal temperature stabilizes (approx. 1.5 hours after the temperature in the thermostatic bath stabilizes).
2. Press Application Switch, then press the menu function key displaying the character string "W-CDMA Uplink."
3. Press Preset.
4. Press F1 (Preset) to perform initialization.
5. Press Cal.
6. Press F1 (SIGANA All) to perform calibration.
7. Press F8 (Close).
8. Press Frequency, enter the frequency output by the vector signal generator using the numeric keypad, then press Enter.
9. Press Amplitude, enter the power meter measurement result using the numeric keypad, then press Enter.
10. Press Trace then press F4 (Storage) and press F1 (Mode) to choose Average using the cursor key or the rotary knob , then press Enter.
11. Press F2 (Count), enter the measurement count, using the numeric keypad, then press Enter.
12. Press Single to perform measurement.

    When measuring the carrier frequency accuracy, select **Auto** for **Reference Signal**. When measuring the residual vector error, select **Fixed to Internal**.

    Press System Config (System Settings) after pressing F3 to display the System Settings screen. Select and set Reference Signal with cursor key, and then press F7 (Set).
13. Confirm whether the measured Frequency Error (carrier frequency accuracy) is within the specifications.
14. Confirm whether the measured EVM (rms) (residual vector error) value is within the specifications.

(5) Test results

Table 4.2.1-1 Carrier frequency accuracy

Frequency	Min. limit	Deviation (Hz)	Max. limit	Uncertainty	Pass/Fail
400 MHz	MS269xA –5 Hz		MS269xA +5 Hz	MS269xA ±1 Hz	
1950 MHz	MS2830A –6 Hz		MS2830A +6 Hz	MS2830A ±0.7 Hz	
3000 MHz	MS2850A –6 Hz		MS2850A +6 Hz	MS2850A ±0.7 Hz	

Table 4.2.1-2 Residual vector error

Frequency	Measured value [% (rms)]	Max. limit	Uncertainty	Pass/Fail
400 MHz		MS269xA 1.0% (rms)	MS269xA 0.1% (rms)	
1950 MHz		MS2830A 1.2% (rms)	MS2830A 0.1% (rms)	
3000 MHz		MS2850A 1.2% (rms)	MS2850A 0.1% (rms)	

Chapter 5 Other Functions

This chapter describes other functions of this application.

5.1 Selecting Other Functions 5-2
5.2 Setting Title 5-2
5.3 Erasing Warmup Message 5-2

5.1 Selecting Other Functions

Pressing F8 (Accessory) on the main function menu displays the Accessory function menu.

Table 5.1-1 Accessory function menu

Function Keys	Menu Display	Function
F1	Title	Sets the title character string.
F2	Title (On/Off)	Displays (On) or hides (Off) the title character string.
F4	Erase Warm Up Message	Erases the warmup message display.

5.2 Setting Title

A title of up to 32 characters can be displayed on the screen. (Character strings of up to 17 characters can be displayed on a function menu. The maximum number of characters to be displayed on the top of the function menu varies according to character string.)

<Procedure>

1. Press F8 (Accessory) on the main function menu.
2. Press F1 (Title) to display the character string input screen. Select a character using the rotary knob, and enter it by pressing Enter. Enter the title by repeating this operation. When the title is entered, press F7 (Set).
3. Press F2 (Title) and then select "Off " to hide the title.

5.3 Erasing Warmup Message

The warmup message (Warm Up), which is displayed upon power-on and indicates that the level and frequency are not stable, can be deleted.

<Procedure>

1. Press F8 (Accessory) on the main function menu.
2. Press F4 (Erase Warm Up Message) to erase the warmup message.

Appendix A Error Messages

Table A-1 Error Messages

Message	Description
Out of range	The settable range is exceeded.
Not available in Constellation Select.	This operation is invalid when Constellation is selected.
Not available in Bottom Graph Select.	This operation is invalid when Bottom Graph is selected.
Not available with I selected as Branch.	This operation is invalid when Branch I is selected.
Not available with Q selected as Branch.	This operation is invalid when Branch Q is selected.
Please Load Signal Analyzer.	The Signal Analyzer function must be loaded.
Please Load Spectrum Analyzer.	The Spectrum Analyzer function must be loaded.
No file to read.	There is no file that can be read.
File read error.	File reading has failed.
File format error.	The file format is invalid.
Invalid character	–

Appendix B Initial Value List

<Common Parameters>

Frequency	
Carrier Frequency	1.920 GHz
Amplitude	
Input Level	–10.00 dBm
Level Offset On/Off	Off
Level Offset Value	0.00 dB
Pre-Amp	Off
Trigger	
Trigger Switch	Off
Trigger Source	External
Trigger Slope	Rise

<W-CDMA/HSPA Basic Parameters>

Common Setting	
Scrambling Code	000000
Transient Period	Include
EVM Origin Offset	Include
Active Code Threshold	–30.0 dB

<Modulation Analysis>

Analysis Time	
Starting Slot Number	0
Measurement Interval	1 slot
Target Slot Number	0
Trace Mode	EVM vs Chip
Scale	
EVM vs Chip	10%
Mag Error vs Chip	±5%
Phase Error vs Chip	±5 degree
Storage	
Mode	Off
Count	10
Marker	
Marker	On
Constellation Marker Number	0
Bottom Graph Marker Number	0

<Code Domain>

Analysis Time	
Starting Slot Number	0
Measurement Interval	1 slot
Branch	I
I Code Number	0
Q Code Number	0
Target Slot Number	0
Trace Mode	Code Power vs Symbol
Scale	
Code Domain Power	80 dB
Code Domain Error	80 dB
EVM vs Symbol	5%
Mag Error vs Symbol	±5%
Code Power vs Symbol	40 dB
Code Power Scale Offset	0 div
Marker	
Marker	On
Marker Number	0 symbol

<Accessory>

Accessory	
Title	On
Title Entry	W-CDMA_HSPA Uplink

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