MX269026A
EV-DO Forward Link
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) or MS2830A Signal Analyzer Operation Manual (Mainframe Operation). Please also refer to it document before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3203AE-8.0

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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.

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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.

MX269026A
EV-DO Forward Link Measurement Software
Operation Manual Operation

20 May 2009 (First Edition)
30 September 2020 (Eighth Edition)

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2. You and Anritsu may terminate this EULA by a written notice to the other party 30 days in advance.

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Revision History:

February 29th, 2020

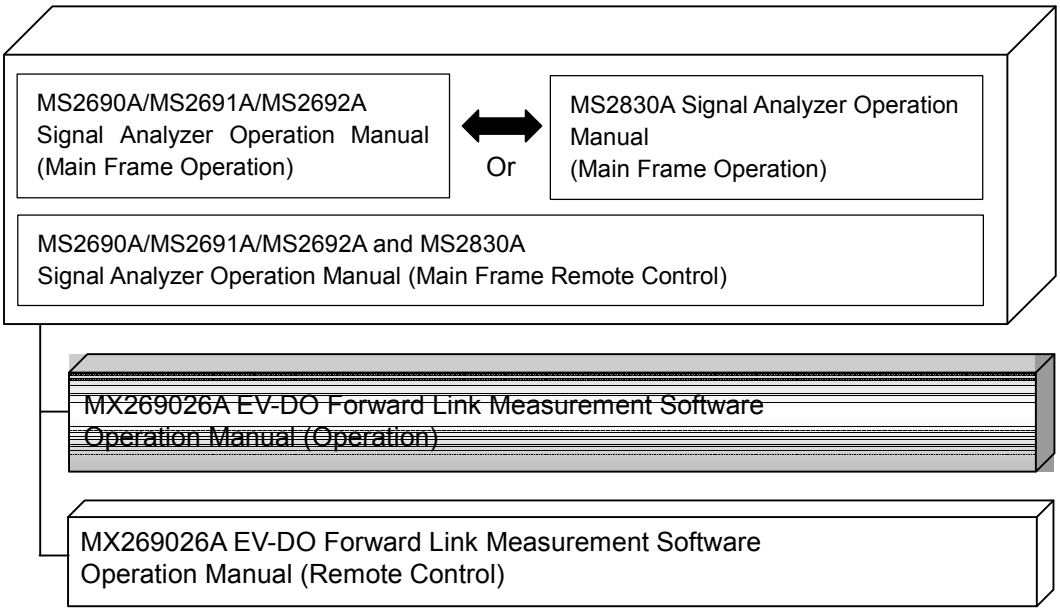
Cautions Against Computer Virus Infection

- 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

■ **Composition of Operation Manuals**

The operation manuals for the MX269026A EV-DO Forward Link Measurement Software are comprised as shown in the figure below.



- **Signal Analyzer Operation Manual (Mainframe Operation)**
- **Signal Analyzer Operation Manual (Mainframe Remote Control)**

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

- **EV-DO Forward Link Measurement Software Operation Manual (Operation) <This document>**

This manual describes basic operating methods, and functions of the EV-DO Forward Link Measurement Software.

- **EV-DO Forward Link Measurement Software Operation Manual (Remote Control)**

This manual describes remote control of the EV-DO Forward Link Measurement Software.

Convention Used in This Manual

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

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Chapter 1 Overview

This chapter provides an overview and describes the product configuration of the MX269026A EV-DO Forward Link Measurement Software.

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1.1 Product Overview

The MS2690A/MS2691A/MS2692A or MS2830A Signal Analyzer enables high-speed, high-accuracy, and simple measurements of transmission characteristics of base stations and mobile stations for various mobile communications types. 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 MX269026A EV-DO Forward Link Measurement Software (hereinafter referred to as MX269026A) is a software option for measuring the RF characteristics of CDMA2000 EV-DO forward link specified by 3GPP.

The MX269026A 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 MX269026A on MS2830A.

1.2 Product Configuration

1.2.1 Standard configuration

Table 1.2.1-1 lists the standard configuration of the MX269026A.

Table 1.2.1-1 Standard configuration

Item	Model Name/Symbol	Product Name	Q'ty	Remarks
Application	MX269026A	EV-DO Forward Link Measurement Software	1	
Accessory	—	Installation CD-ROM	1	Application software, operation manual CD-ROM

1.2.2 Option

Table 1.2.2-1 lists the specifications for the MX269026A. They are sold separately.

Table 12.2-1 Options

Option number	Model	Remarks
MX269026A-001	All Measure Function	

1.2.3 Applicable parts

Table 1.2.3-1 lists the applicable parts for the MX269026A.

Table 1.2.3-1 Applicable parts

Model Name/Symbol	Product Name	Remarks
W3203AE	MX269026A EV-DO Forward Link Measurement Software Operation Manual (Operation)	English, printed version
W3204AE	MX269026A EV-DO Forward Link Measurement Software Operation Manual (Remote Control)	English, printed version

1.3 Specifications

Table 1.3-1 shows the specifications for the MX269026A.

Table 1.3-1 Specifications

Item	Specification
Modulation/Frequency Measurement	
Measurement frequency ranges	400 to 2700 MHz
Measurement level range	–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) –15 to +10 dBm (at Pre-Amp On)
Carrier frequency accuracy	After CAL execution at 18 to 28°C For a signal of EVM = 1% ± (accuracy of reference frequency signal × carrier frequency + 10 Hz)
Residual EVM	After CAL execution at 18 to 28°C the signal measured is within the measurement level range and below the value set in Input Level. MS269x Series: <1.0% (rms) MS2830A <1.5% (rms)
Residual Waveform Quality (ρ)	After CAL execution, at 18 to 28°C, the signal measured is within the measurement level range and below the value set in Input Level. MS269x Series: > 0.99990 MS2830A: > 0.99978
Amplitude Measurement	
Transmitter power accuracy	After CAL execution, input attenuator ≥ 10 dB, at 18 to 28°C, the signal measured is within the measurement level range and below the value set in 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.) Transmitter power accuracy is calculated from an RSS (root summed square) error of the absolute amplitude accuracy and the in-band frequency characteristics of the MS2690A/MS2691A/MS2692A or MS2830A.
Code domain measurement	
Code Domain Power Accuracy	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. As for the MAC channel area measurement, when measured with the setting of Average Count≥16. ±0.02 dB (Code Power ≥ –10dBc) ±0.05 dB (Code Power ≥ –20dBc) ±0.10 dB (Code Power ≥ –30dBc)
Adjacent Channel Power Measurement	
Measurement method	Executes the adjacent channel power measurement function of the Spectrum Analyzer or Signal Analyzer.

Table 1.3-1 Specifications (Cont'd)

Item	Specification
Occupied Bandwidth Measurement	
Measurement method	Executes the occupied bandwidth measurement function of the Spectrum Analyzer or Signal Analyzer.
Channel Power Measurement	
Measurement method	Executes the channel power measurement function of the Spectrum Analyzer or Signal Analyzer.
Spectrum Emission Mask Measurement	
Measurement method	Executes 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)” or “MS2830A 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)" or "MS2830A Signal Analyzer Operation Manual (Mainframe Operation)".

2.1.1 Front panel

This section describes the front-panel keys and connectors.

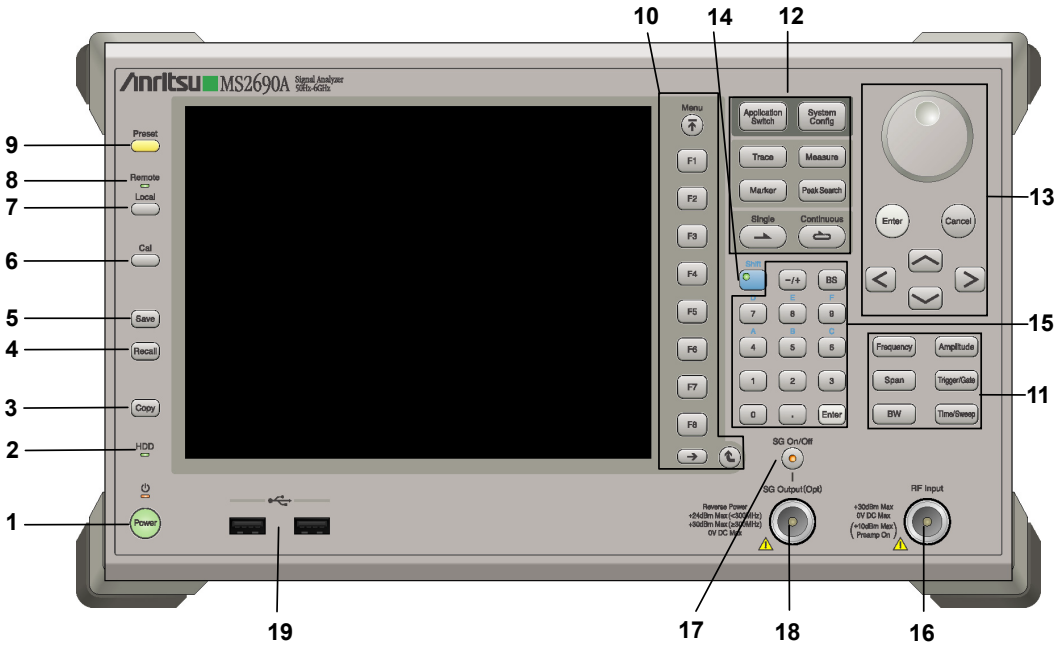


Figure 2.1.1-1 MS269x series front panel

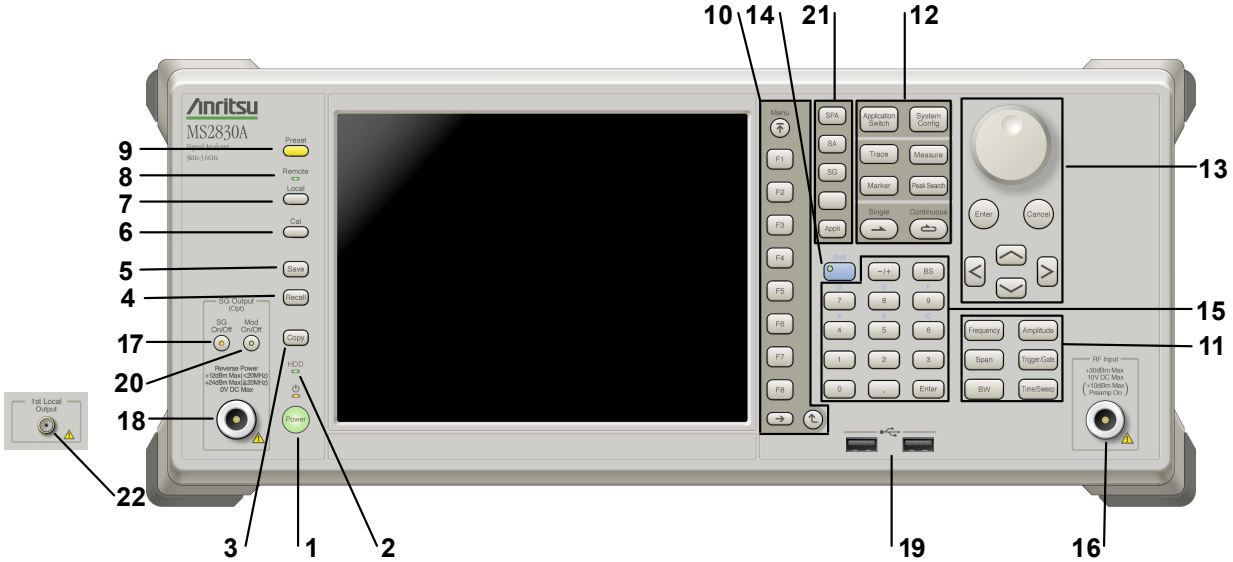


Figure 2.1.1-2 MS2830A front panel

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

Lights when accessing the internal hard disk

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

Local key

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

8 Remote

Remote lamp

Lights when in remote-control state

9 Preset

Preset key

Resets parameters to initial settings

10

Menu

F1

F2

F3

F4

F5

F6

F7

F8

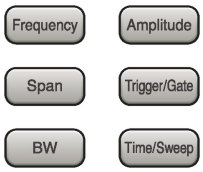
Function keys

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.

Press to set frequency parameters.

Press to set level parameters.

No function is assigned to this key.

Press to set trigger parameters.

No function is assigned to this key.

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.

Press to switch application.

Press to display Configuration screen.

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

Press to set measurement item parameters.

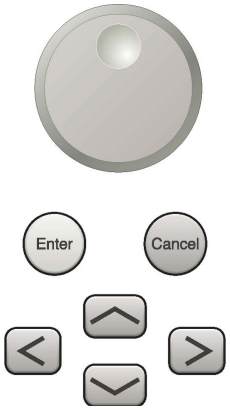
Use when switching graph marker operation.

Press to set parameters related to the peak search function.

Press to start single measurement.

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.

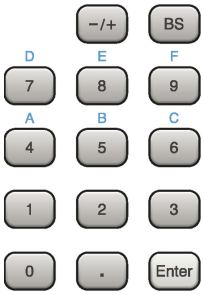
Press Cancel to cancel input or selected data.

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 connector

Inputs RF signal. This is an N type input connector.

17

RF Output Control key

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.

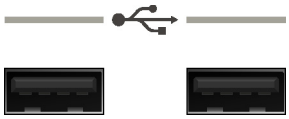
This is not available when the Option 044/045 is installed. (Only for MS2830A)

18

RF Output connector (when Option 020 installed)

Outputs RF signal, when the Vector Signal Generator option is installed.
This is an N type output connector.
This is not available when the Option 044/045 is installed. (Only for MS2830A)

19



USB connector (type A)

Connect the accessory USB keyboard, mouse or USB memory.

20

Modulation control key (MS2830A only)

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 is not available when the Option 044/045 is installed.

21

Application key (MS2830A only)

Press to switch between applications.

Press to display the Spectrum Analyzer main screen.

Press to display the Signal Analyzer main screen, when Option 005/105 and 006/106 are installed.

Press to display the Signal Analyzer main screen, when Vector Signal Generator option is installed.

This is a blank key. Not used.

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)".

22

1st Local Output connector (Only for MS2830A)

This is available when the Option 044/045 is installed.
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.

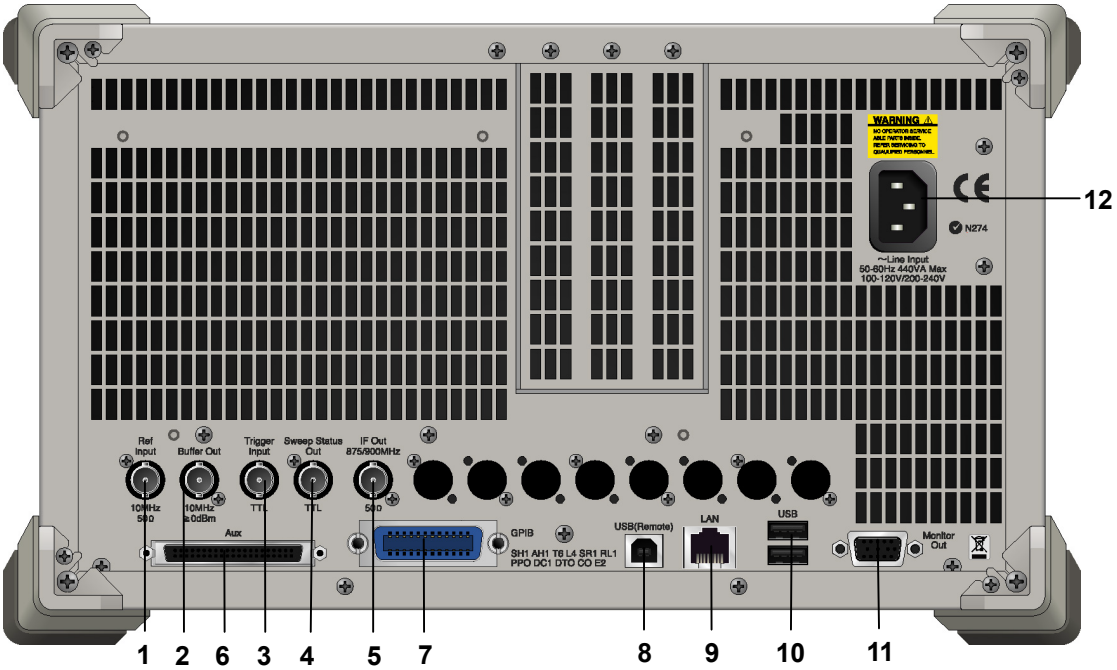


Figure 2.1.2-1 MS269x series rear panel

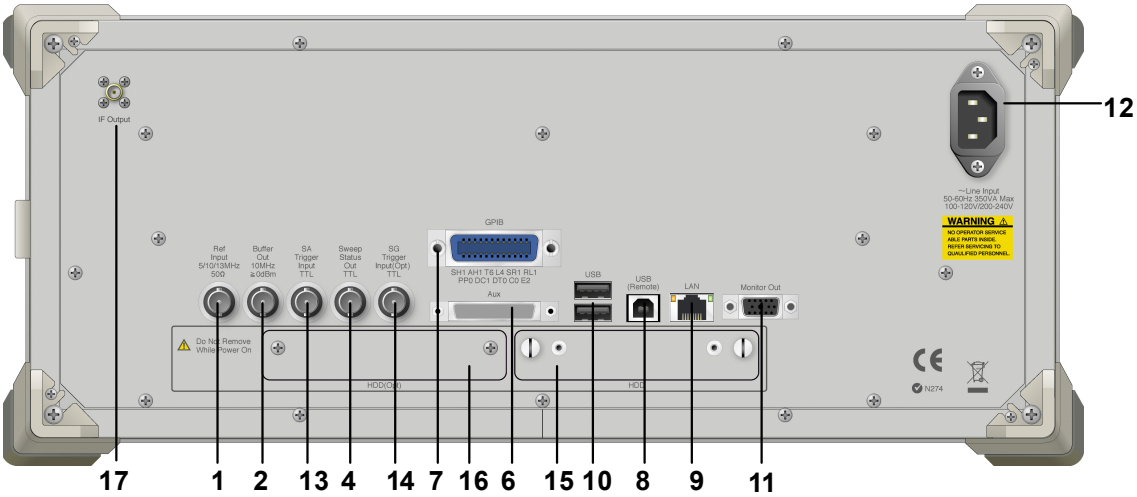
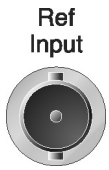


Figure 2.1.2-2 MS2830A rear panel

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 to that of other equipment. The following frequencies are supported:

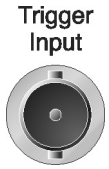
MS269x series: 10 MHz/13 MHz
MS2830A: 5 MHz/10 MHz/13 MHz

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.

3



Trigger Input connector (MS269x series only)

Inputs trigger signal from external device.

4

Sweep Status Out connector

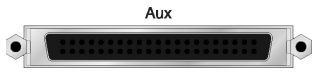
Outputs signal when internal measurement is performed or measurement data is obtained.

5

IF Out connector (MS269x series only)

Not used

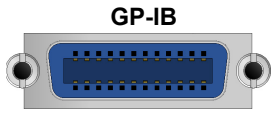
6



AUX connector

Not used

7



GPIB connector

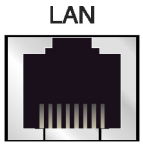
For external control via GPIB.

8

USB connector (type B)

For external control via USB

9



Ethernet connector

Connects PC or Ethernet network.

10

USB connector (type A)

Used to connect a USB keyboard or mouse or the USB memory supplied.

11

Monitor Out connector

Connects external display

12

AC inlet

Supplies power

13

SA Trigger Input connector (MS2830A only)

This is a BNC connector for inputting external trigger signal (TTL) for SPA and SA applications.

14

SG Trigger Input connector (MS2830A only)

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

15 HDD

HDD slot (MS2830A only)

This is a standard hard disk slot.

16 HDD(Opt)

HDD slot for Option (MS2830A only)

This is a hard disk slot for the options.

17

IF output connector (Only for MS2830A)

Monitor output of the internal IF signal.

This is available when the Option 044/045 is installed.

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.

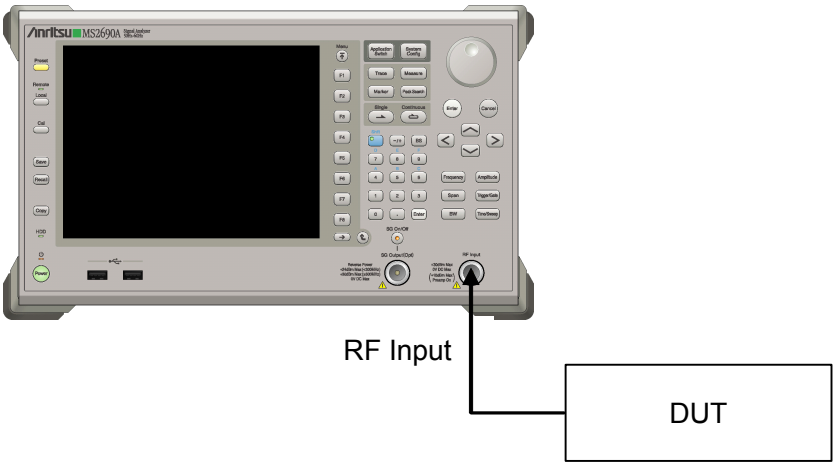


Figure 2.2-1 Signal path setup example

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

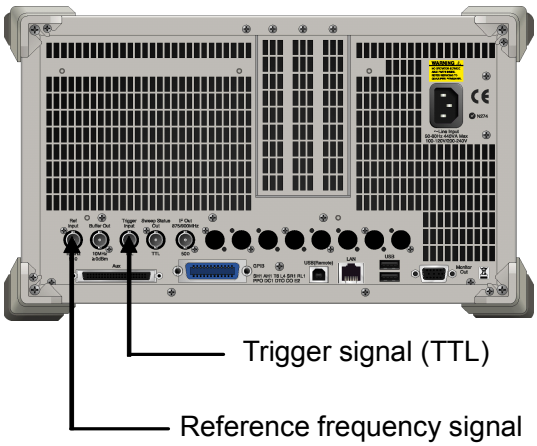


Figure 2.2-2 External signal input

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)” or “MS2830A Signal Analyzer Operation Manual (Mainframe Operation)”.

Chapter 3 Measurement

This section describes the measurement function, the parameter contents and the setting methods for the MX269026A.

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3.1.1 Screen layout 3-2
3.1.2 Main function menu 3-3
3.1.3 Performing measurement 3-4
3.2 Setting Frequency 3-5
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3.10.2 SEM Result Detail Screen 3-32

3.1 Basic Operation

Press [Application Switch] to display the Application Switch function menu. Pressing the function key with the indication of (EV-DO Forward) displays the application screen.

3.1.1 Screen layout

This section describes the screen layout of the MX269026A.

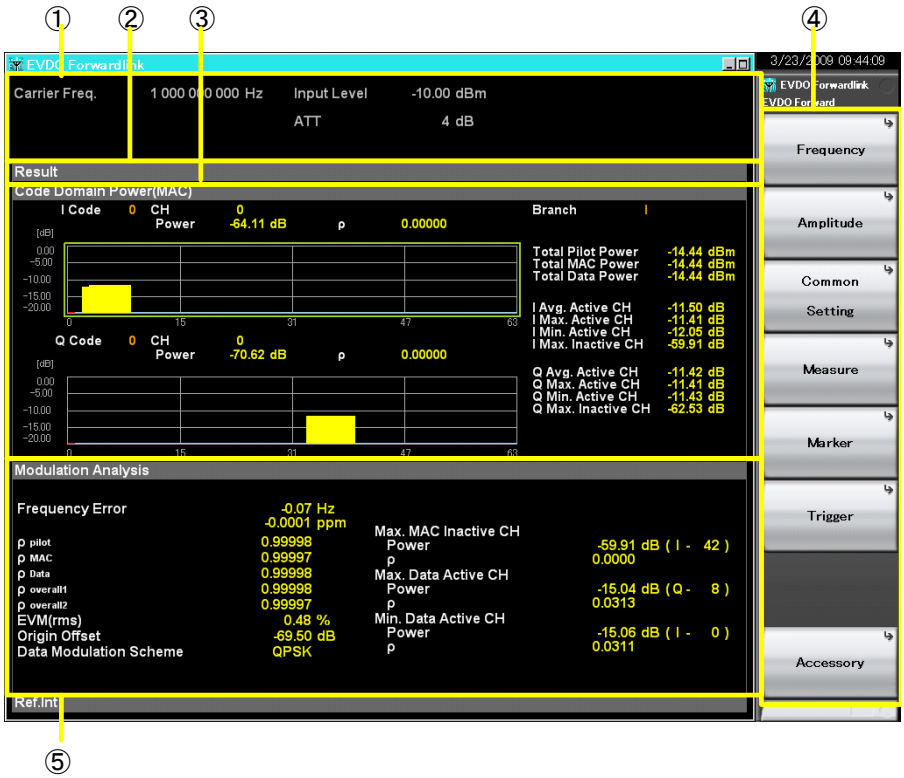

Figure 3.1.1-1 Screen Layout

① Measurement Parameters

Parameter Display Window

② Status message

Displays signal status.

③ Graph window

Displays a graph of measurement results.

④ Function menu

Displays the functions executable with function keys.

⑤ Numeric result window

Displays measured results.

3.1.2 Main function menu

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

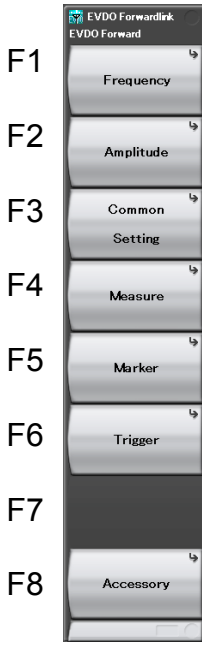

Figure 3.1.2-1 Main function menu

Table 3.1.2-1 Main function menu

Function Key	Menu Display	Function
F1	Frequency	Sets frequency ☞3.2 “Setting Frequency”
F2	Amplitude	Sets level. ☞3.3 “Setting Level”
F3	Common Setting	This sets common items. ☞3.4 “Setting Common Items”
F4	Measure	Sets measurement items. ☞3.5 “Setting Measurement Items”
F5	Marker	Sets a marker. ☞3.6 “Setting markers”
F6	Trigger	Sets a trigger. ☞3.7 “Setting Trigger”
F8	Accessory	Performs settings for 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 Measurement

Measurement is performed the number of times specified by **Storage Count**, and then stopped.

<Procedure>

1. Press Single .

Continuous Measurement

Measurement is continuously performed the number of times specified by **Storage Count**. Measurement will continue even if parameters are changed or the window display is changed.

<Procedure>

1. Press Continuous.

3.2 Setting Frequency

Configures settings related to frequency. Press F1 (Frequency) in the main function menu to display the Frequency function menu. Pressing Frequency displays the Frequency function menu and opens the Carrier Frequency dialog box.

Table 3.2-1 Frequency function menu

Function Key	Menu Display	Function
F1	Carrier Frequency	Sets a carrier frequency Setting range 100 MHz to the upper limit of the main unit
F7	RF Spectrum	Sets whether to invert the IQ spectrum of the input signal. Selection options Norm Measures without reversed IQ spectrum. Rvs Measures with reversed IQ spectrum.

3.3 Setting Level

Configures settings related to level. Press F2 (Amplitude) in the main function menu to display the Amplitude function menu. Pressing Amplitude displays the Amplitude function menu and opens the Input Level dialog box.

Table 3.3-1 Amplitude function menu

Function Key	Menu Display	Function
F1	Input Level	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
F4	Pre-Amp	Turns the Pre-Amp function On/Off. Pre-Amp can be set only when Hardware Option 008 is installed. Selection options On Enables the Pre-Amp function.. Off Disables the Pre-Amp function.
F7	Offset	Turns the Offset function On/Off. Selection options On Enables the offset function. Off Disables the offset function.
F8	Offset Value	Sets the level offset coefficient. Setting range –99.99 to 99.99 dB Figure 3.3-1 Setting example

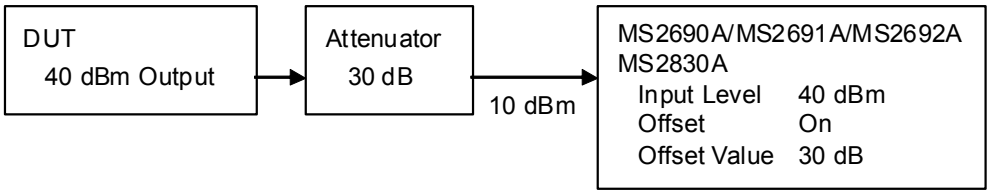

Figure 3.3-1 Setting example

3.4 Setting Common Items

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

Table 3.4-1 Common Setting function menu

Function Key	Menu Display	Function
F1	Physical Layer Subtype	Selects the physical layer subtype of the input signal. Selection options Subtype0/1 Select this to measure a physical layer (Rev. 0) signal of subtype 0 or 1. Subtype2 Select this to measure a physical layer (Rev. A) signal of subtype 2.
F2	Slot Type	Selects the slot type of the input signal. Selection options Active Select this to measure active slots. Idle Select this to measure idle slots.
F3	Modulation Type	Selects the modulation mode for the data area in active slots. Selection options Auto Automatically identifies the modulation mode during measurement. QPSK Selects QPSK modulation method. 8PSK Selects 8PSK modulation method. 16QAM Selects 16QAM modulation method.
F4	Preamble Length	Sets the length of the preamble in the data area. Auto Automatically identifies the preamble length during measurement. 0 Performs measurement using the preamble length 0. 64 Performs measurement using the preamble length 64. 128 Performs measurement using the preamble length 128. 256 Performs measurement using the preamble length 256. 512 Performs measurement using the preamble length 512. 1024 Performs measurement using the preamble length 1024.
F5	PN Offset	Sets the index for the pilot PN offset of the input signal. Setting range 0 to 511
F8	Active Code Threshold	Sets the threshold to identify the code as the active code. Setting range –80.0 to –10.0 dB

3.5 Setting Measurement Items

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

Table 3.5-1 Common Setting function menu

Function Key	Menu Display	Function
Page 1		
F1	Code Domain	Selects code domain analysis. 3.5.1 "Code Domain"
F2	Power vs Time	Recalls the Power vs Time function menu. 3.5.2 "Power vs Time"
F3	All Measure	This feature is available when the MX269026A-001 All Measure Function option is installed. Recalls the All Measure function menu. 3.5.7 "All Measure"
F5	ACP(FFT)	Recalls the ACP (FFT) function of the Signal Analyzer function. 3.5.3 "Adjacent Channel Power Measurement (ACP)"
F6	ACP(Swept)	Recalls the ACP (Swept) function of the Spectrum Analyzer function. 3.5.3 "Adjacent Channel Power Measurement (ACP)"
F7	OBW(FFT)	Recalls the OBW (FFT) function of the Signal Analyzer function. 3.5.4 "Occupied Bandwidth Measurement (OBW)"
F8	OBW(Swept)	Recalls the OBW (Swept) function of the Spectrum Analyzer function. 3.5.4 "Occupied Bandwidth Measurement (OBW)"
Page 2		
F3	Channel Power(FFT)	Recalls the Channel Power (FFT) function of the Signal Analyzer function. 3.5.5 "Channel Power Measurement (Channel Power)"
F4	Channel Power(Swept)	Recalls the Channel Power (Swept) function of the Spectrum Analyzer function. 3.5.5 "Channel Power Measurement (Channel Power)"
F6	Spectrum Emission Mask(Swept)	Recalls the Spectrum Emission Mask (Swept) function of the Spectrum Analyzer function. 3.5.6 "Spectrum Emission Mask Measurement (SEM)"

3.5.1 Code Domain

Sets code domain analysis. Pressing F1 (Code Domain) on the Measure function menu displays the Code Domain function menu.

Code Domain function menu is made of two pages. → Press → to toggle between them.

Table 3.5.1-1 Code Domain function menu

Function Key	Menu Display	Function
Page 1		
F2	Branch	Toggles the branch to be analyzed between I and Q. Selection options I Sets I branch for analysis. Q Sets Q branch for analysis.
F3	Code Number I	Sets code number of I branch to be analyzed. This setting is enabled when I branch is set. Setting range 0 to 15 When the Code Domain Channel Type is "Data": 0 to 63 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype0/1": 0 to 127 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype2":
F4	Code Number Q	Sets code number of Q branch to be analyzed. This setting is enabled when Q branch is set. Setting range 0 to 15 When the Code Domain Channel Type is "Data": 0 to 63 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype0/1": 0 to 127 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype2":
Page 2		
F1	Trace	Sets up the trace. ☞3.5.1.1 "Trace"

3.5.1.1 Trace

Sets up the trace. Pressing F1 (Trace) on page 2 of the Code Domain function menu or Trace displays the Trace function menu.

Table 3.5.1.1-1 Trace function menu

Function Key	Menu Display	Function
F2	Code Domain Channel Type	Sets the channel for the result graph. This parameter can be specified if Slot Type is Active. Selection options MAC Display the Code Domain Graph (MAC). Data Displays the Domain Graph (DATA).
F3	Scale	Sets vertical scale of a graphical result. Selection options When the Code Domain Channel Type is MAC: 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. When the Code Domain Channel Type is "Data": ±0.5 dB Sets the vertical range to –15.0 ± 0.5 dB. ±2.5 dB Sets the vertical range to –15.0 ± 2.5 dB. ±5 dB Sets the vertical range to –15.0 ± 5 dB. 80 dB Sets lower limit to –80 dB.
F4	Storage	Recalls the Storage function menu. Table 3.5.1.1-2 Storage function Menu
F8	Display Mode	Sets the code sequence of the code domain graph. This parameter can be specified if **Code Domain Channel Type** is **MAC**. Selection options Walsh Displays the horizontal axis using Walsh codes. MAC Index Displays the horizontal axis using MAC indexes.

Table 3.5.1.1-2 Storage function menu

Function Key	Menu Display	Function
F1	Mode	Sets the storage mode. Setting options Off Updates the data every time it measures. On Displays the average value every time it measures.
F2	Count	Sets the number of measurements. Setting range 2 to 9999

3.5.2 Power vs Time

Specify the settings for power vs. time analysis. Pressing F2 (Power vs Time) on the Measure function menu displays the Power vs Time function menu.

The Power vs Time function menu is made of two pages. Press → to toggle between them.

Table 3.5.2-1 Power vs Time function menu

Function Key	Menu Display	Function
Page 1		
F1	Select Reference Line	Selects the 0 dB reference on the graph. Selection options On Power: Specifies the On Power measurement result as 0 dB. User: Specifies the Reference Line Level as 0 dB.
F2	Reference Line Level	Sets the user-specified value to use as the 0 dB reference on the graph. Setting range –99.99 to 99.99 dBm
F3	Select Mask Standard User	Sets the mask limit level. Selection options Standard: Performs measurement by setting **Upper Limit** to 2.5 dB, **Lower Limit** to –2.5 dB, and **Upper Limit Out of Burst** to –7.0 dB. User: Performs measurement by setting **Upper Limit**, **Lower Limit**, and **Upper Limit Out of Burst** to the user-specified values.
F4	Mask Setup	Sets the user-specified values to use for the template mask. ☞ 3.5.2.1 "Mask Setup"
F5	Unit dB dBm	Sets the vertical axis unit for the graph. Selection options dB: Specifies dB as the units of the vertical axis. dBm: Specifies dBm as the units of the vertical axis.
F6	Display Item Average All	Sets the waveform pattern to be displayed on a graph. Selection options Average: Displays only the average waveform. All: Displays the maximum, minimum, and average waveforms.
F7	Smoothing On Off	Selects On/Off of smoothing. Selection options On: Smoothing processing is performed. Off: Smoothing processing is not performed.

Table 3.5.2-1 Power vs Time function menu (Cont'd)

Function Key	Menu Display	Function
Page 1		
F8	Filter Type *****	Sets the filter. Selection options Flattop Specifies the flat top filter. Gaussian Specifies the Gaussian filter. Narrow Specifies the Narrow filter.
Page 2		
F1	Trace	Sets up the trace. ☞ 3.5.2.2 "Trace"

3.5.2.1 Mask Setup

Specify the mask settings. Pressing F4 (Mask Setup) on the page 1 of the Power vs Time function menu displays the Mask Setup function menu.

Table 3.5.2.1-1 Mask Setup function menu

Function Key	Menu Display	Function
F1	Upper Limit **.*dB	Sets the upper limit for the burst-on time. Setting range 0.01 to 30.00 dB
F2	Lower Limit **.*dB	Sets the lower limit for the burst-on time. Setting range –30.00 to –0.01 dB
F3	Upper Limit Out of Burst **.*dB	Sets the upper limit for the burst-off time Setting range –30.00 to 30.00 dB

3.5.2.2 Trace

Sets up the trace. Pressing F1 (Trace) on page 2 of the Power vs Time function menu or Trace displays the Trace function menu.

Table 3.5.2.2-1 Trace function menu

Function Key	Menu Display	Function
F1	Trace Mode	Sets Trace Mode. Selection options Halfslot — Displays the halfslot time. On Portion — Displays the pilot/MAC burst time. Ramp — Displays the ramp time of the Pilot/MAC burst.
F2	Target Halfslot	Sets the half slot to measure. Selection options 1st Halfslot — Displays the measurement results for the first half slot. 2nd Halfslot — Displays the measurement results for the second half slot. Full slot — Displays the average measurement result for the first and second half slots.
F3	Scale	Sets vertical scale of a graphical result. Selection options If **Trace Mode** is **Halfslot** or **Ramp**: 10 dB Sets the vertical range to –5 to 5 dB. 20 dB Sets the vertical range to –10 to 10 dB. 50 dB Sets the vertical range to –40 to 10 dB. 100 dB Sets the vertical range to –90 to 10 dB. If Trace Mode is On Portion: 10 dB Sets the vertical range to –5 to 5 dB. 20 dB Sets the vertical range to –10 to 10 dB.
F4	Storage	Recalls the Storage function menu. ☞ Table 3.5.1.1-2 Storage function Menu

3.5.3 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 on the corresponding parameters. Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)”or “MS2830A Signal Analyzer 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.

3.5.4 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 on the corresponding parameters. Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)”or “MS2830A Signal Analyzer 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.

3.5.5 Channel Power Measurement

Recalls the Channel Power 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 on the corresponding parameters. Section 3.6.2 “Recalling parameters” of the “MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)”or “MS2830A Signal Analyzer Operation Manual (Mainframe Operation)” cannot be executed when this function is being recalled.

Channel Power (FFT)

■ Summary

Recalls the Channel Power function of the Signal Analyzer function, and then 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.

3.5.6 Spectrum Emission Mask Measurement (SEM)

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

Spectrum Emission Mask (Swept)

■ Summary

Recalls the spectrum emission mask function of the Spectrum Analyzer function, and then performs spectrum emission mask measurement for the reflected parameter settings.

3.5.7 All Measure

This feature is available when the MX269026A-001 All Measure Function option is installed.

Sets the All Measure function. Pressing F3 (All Measure) at the Measure function menu displays the All Measure screen and the All Measure function menu.

This function allows the following measurements:

- Power vs Time
- Modulation Analysis
- Occupied Bandwidth (OBW)
- Spectrum Emission Mask (SEM) (Offset frequency < 4 MHz)

Table 3.5.7-1 All Measure function menu

Function Key	Menu Display	Function
F1	Modulation Analysis Setting	Recalls the Mod Analysis Setting function menu. ☞ Table 3.5.7-2 Mod Analysis Setting function menu
F2	Occupied Bandwidth Setting	Recalls the OBW Setting function menu. ☞ Table 3.5.7-5 OBW Setting function menu
F3	Spectrum Emission Mask Setting	Recalls the SEM Setting function menu. ☞ Table 3.5.7-6 SEM Setting function menu
F8	SEM Result Detail/ Main Result	Press to toggle between the SEM Result Detail and Main Result screen. ☞ 3.10 All Measure

Table 3.5.7-2 Mod Analysis Setting function menu

Function Key	Menu Display	Function
F1	Measure On Off	Enables/disables the Modulation Analysis measurement.
F2	Storage	Recalls the Storage function menu. ☞ Table 3.5.7-3 Storage function menu
F6	Select Mask Standard User	Sets Limit Level of Mask. Selection options Standard Performs measurement by setting Upper Limit to 2.5 dB, Lower Limit to –2.5 dB, and Upper Limit Out of Burst to –7.0 dB. User Performs measurement by setting Upper Limit, Lower Limit, and Upper Limit Out of Burst to the user-specified values.
F7	Mask Setup (PvsTime)	Recalls the Mask Setup function menu. ☞ Table 3.5.7-4 Mask Setup function menu
F8	Smoothing Filter (PvsTime) On Off	This enables or disables smoothing processing. Selection options On Smoothing processing is performed. Off Smoothing processing is not performed.

Table 3.5.7-3 Storage function menu

Function Key	Menu Display	Function
F1	Mode	Sets the storage mode. Setting options Off Updates the data every time it measures. On Displays the average value every time it measures.
F2	Count	Sets the number of measurements. Setting range 2 to 999

Table 3.5.7-4 Mask Setup function menu

Function Key	Menu Display	Function
F1	Upper Limit **.*dB	Sets Upper Limit of Burst On time. Setting range 0.01 to 30.00 dB
F2	Lower Limit **.*dB	Sets Lower Limit of Burst On time. Setting range –30.00 to –0.01 dB
F6	Upper Limit Out of Burst **.*dB	Sets Upper Limit of Burst Off time. Setting range –30.00 to 30.00 dB

Table 3.5.7-5 OBW Setting function menu

Function Key	Menu Display	Function
F1	Measure On Off	Enables/disables the OBW measurement.
F2	Storage	Recalls the Storage function menu. ☞ Table 3.5.7-3 Storage function menu

Table 3.5.7-6 Seams Setting function menu

Function Key	Menu Display	Function
F1	Measure On Off	Enables/disables the SEM measurement.
F2	Storage	Recalls the Storage function menu. ☞ Table 3.5.7-3 Storage funtion menu
F6	Result Type Peak Margin	Switches the result type between Peak and Margin for each offset level. Selection options Peak Displays in absolute power. Margin Displays the relative power in terms of limit line and actual value.
F8	Load Limit Parameter	Loads the Limit Parameter screen. ☞ Figure 3.5.7-1 Limit Parameter Selection Screen

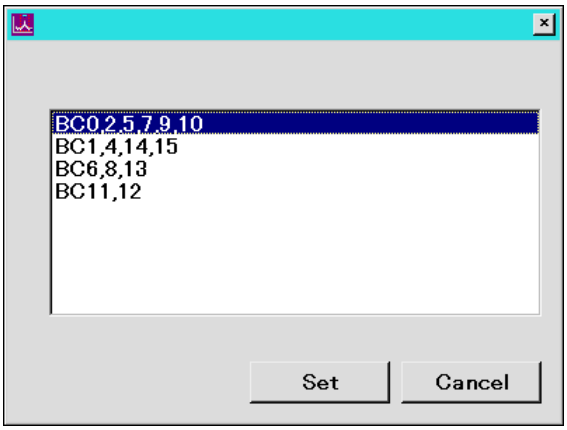

Figure 3.5.7-1 Limit Parameter Selection Screen

3.6 Setting Markers

Perform the marker-related settings. Pressing F5 (Marker) on the main function menu or Marker displays the page 1 of the Marker function menu. The items displayed on the Marker function menu vary depending on the settings specified by the Measure function menu.

3.6.1 Marker settings for code domain analysis results

Table 3.6.1-1 Code Domain function menu

Function Key	Menu Display	Function
F2	Branch	Toggles the branch to be analyzed between I and Q. Selection options I Specifies that the I branch is to be analyzed. Q Specifies that the Q branch is to be analyzed.
F3	Code Number I	Sets code number of I branch to be analyzed. This setting is enabled when I branch is set. Setting range 0 to 15 When the Code Domain Channel Type is "Data": 0 to 63 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype0/1": 0 to 127 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype2":
F4	Code Number Q	Sets code number of Q branch to be analyzed. This setting is enabled when Q branch is set. Setting range 0 to 15 When the Code Domain Channel Type is "Data": 0 to 63 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype0/1": 0 to 127 When the Code Domain Channel Type is "MAC" and the Physical Layer Subtype is "Subtype2":

3.6.2 Marker settings for Power vs Time analysis results

Table 3.6.2-1 Marker function menu

Function Key	Menu Display	Function
F1	Marker	Toggles the branch to be analyzed between I and Q. Toggles marker function between On and Off. Selection options On Enables the Marker function. Off Disables the Marker function.
F3	Marker Number	Sets the Marker position. Setting range (Unit : PNChips) –100.00 to 1124.00 When Trace Mode is Halfslot 390.00 to 634.00 When Trace Mode is OnPortion 380.00 to 643.00 When Trace Mode is Ramp

3.7 Setting Trigger

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

Table 3.7-1 Trigger function menu

Function Key	Menu Display	Function
F1	Trigger Switch	This sets the trigger synchronization On/Off. Selection options On Enables the Trigger function. Off Disables the Trigger function.
F2	Trigger Source	This sets the trigger source. Selection options External Measurement starts with external trigger signal input. SG Marker Starts measurement by the timing of internal Vector Signal Generator option.
F3	Trigger Slope	Sets the trigger polarity. Selection options Rise Synchronizes with rising edge of the trigger. Fall Synchronizes with falling edge of the trigger.
F8	Trigger Delay	Sets the trigger delay. Setting range –2.0000000 to +2.0000000 s

3.8 Displaying Code Domain Analysis Results

Status message

Figure 3.8-1 Status message

Result

Trigger Wait

Displays signal status.

Average & Max Ex: 176/ 200

Measured Count / Measurement Count specified with Storage

Displays the Average setting of Code Domain Power measurement.

Table 3.5.1.1-1 Trace function menu

3.8.1 Graph window

Displays code domain analysis results in a graph. The result of each analysis is displayed if the storage mode is disabled (**Storage: Mode** = **Off**), and the average analysis result is displayed if the mode is enabled (**Storage: Mode** = **On**.)

3.5.1.1 “Trace”

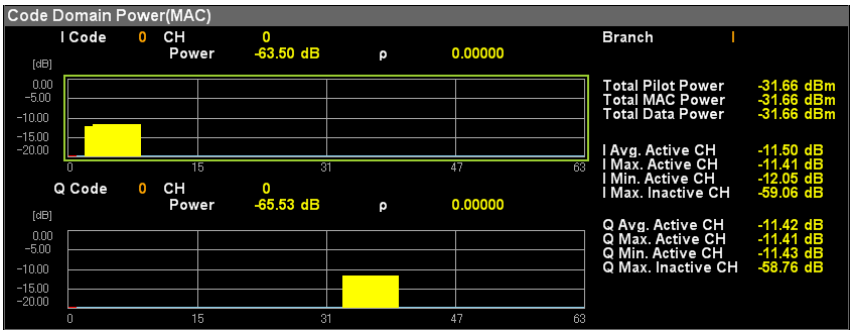

Figure 3.8.1-1 Graph window

Code Domain Power (MAC)

Displays the Code Domain Power window.
( ) indicates the type of Code Domain Channel.

3.5.1.1 Trace

I Code

Displays the marker position on the I branch.

CH

Displays the channel at the marker on the I branch.

Power

Displays the power at the marker on the I branch.

ρ

Displays ρ at the marker on the I branch.

Q Code

Displays the marker position on the Q branch.

CH

Displays the channel at the marker on the Q branch.

Power

Displays the power at the marker on the Q branch.

ρ

Displays ρ at the marker on the Q branch.

Branch

Displays the branch for manipulating the marker.

Total Pilot Power

Displays the power in the pilot area. This is the power obtained after passing through an inverse characteristics filter of the baseband filter defined in 3GPP2 C.S0024 and an equalizing filter.

Total MAC Power

Displays the power in the pilot area. This is the power obtained after passing through an inverse characteristics filter of the baseband filter defined in 3GPP2 C.S0024 and an equalizing filter.

Total Data Power

Displays the power in the data area. This is the power obtained after passing through an inverse characteristics filter of the baseband filter defined in 3GPP2 C.S0024 and an equalizing filter.

I Avg. Active CH

Displays the average power of the active channels on the I branch.

I Max. Active CH

Displays the maximum channel power among the active channels on the I branch.

I Min. Active CH

Displays the minimum channel power among the active channels on the I branch.

I Max. Inactive CH

Displays the maximum channel power among the inactive channels on the I branch.

Q Avg. Active CH

Displays the average power of the active channels on the Q branch.

Q Max. Active CH

Displays the maximum channel power among the active channels on the Q branch.

Q Min. Active CH

Displays the minimum channel power among the active channels on the Q branch.

Q Max. Inactive CH

Displays the maximum channel power among the inactive channels on the Q branch.

3.8.2 Numeric result window

Displays the numerical code domain analysis results. The result of each analysis is displayed if the storage mode is disabled (**Storage: Mode** = **Off**), and the average analysis result is displayed if the mode is enabled (**Storage: Mode** = **On**).

☞3.5.1.1 "Trace"

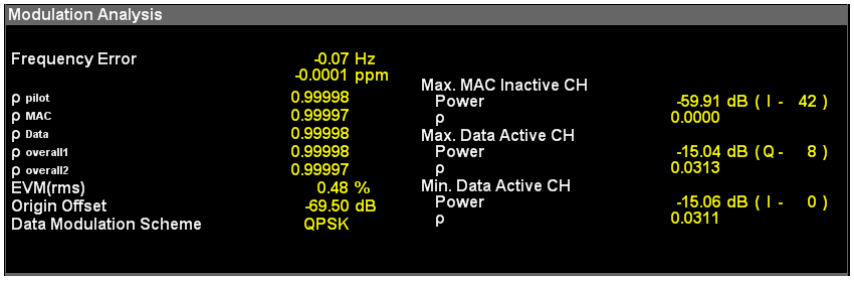

Figure 3.8.2-1 Numeric result window

Modulation Analysis

Displays the Modulation Analysis window.

Frequency Error

Displays the frequency error.

ρ pilot

Displays ρ in the pilot area.

ρ MAC

Displays ρ in the MAC area.

ρ Data

Displays ρ in the data area. This is displayed if **Slot Type** is **Active**.

ρ overall1

Displays ρ in the first half slot area. This is displayed if **Slot Type** is **Active**.

ρ overall2

Displays ρ in the half slot area centered on the first chip in the second half slot area. This is displayed if **Slot Type** is **Active**.

EVM (rms)

Displays the average EVM.

Origin Offset

Displays the average origin offset.

Data Modulation Scheme

Displays the modulation mode for the data area. This is displayed if Slot Type is Active.

Timing Error

Displays the difference between the index specified for PN Offset for the RF input and trigger input. This is displayed if Trigger Switch is On.

Max. MAC Inactive CH

Displays the maximum inactive channel in the MAC area.

Max. MAC Inactive CH : Power

Displays the maximum channel power among the inactive channels in the MAC area.

Max. MAC Inactive CH : ρ

Displays the maximum ρ among the inactive channels in the MAC area.

Max. Data Active CH

Displays the maximum active channel in the data area. This is displayed if Slot Type is Active.

Max. Data Active CH : Power

Displays the maximum channel power among the active channels in the data area. This is displayed if Slot Type is Active.

Max. Data Active CH : ρ

Displays the maximum ρ among the active channels in the data area. This is displayed if Slot Type is Active.

Min. Data Active CH

Displays the minimum active channel in the data area. This is displayed if Slot Type is Active.

Min. Data Active CH : Power

Displays the minimum channel power among the active channels in the data area. This is displayed if Slot Type is Active.

Min. Data Active CH : ρ

Displays the minimum ρ among the active channels in the data area. This is displayed if Slot Type is Active.

3.9 Displaying Power vs Time Analysis Results

Status message

Figure 3.9-1 Status message

Result

Measuring

Displays signal status.

Average & Max Ex: 200/ 200

Measured Count / Measurement Count specified with Storage

Displays the Average setting of Power vs Time measurement.

Table 3.5.2.2-1 Trace function menu

3.9.1 Graph window

Displays Power vs Time analysis results in a graph. The result of each analysis is displayed if the storage mode is disabled (**Storage: Mode** = **Off**), and the average analysis result is displayed if the mode is enabled (**Storage: Mode** = **On**).

3.5.2.2 “Trace”

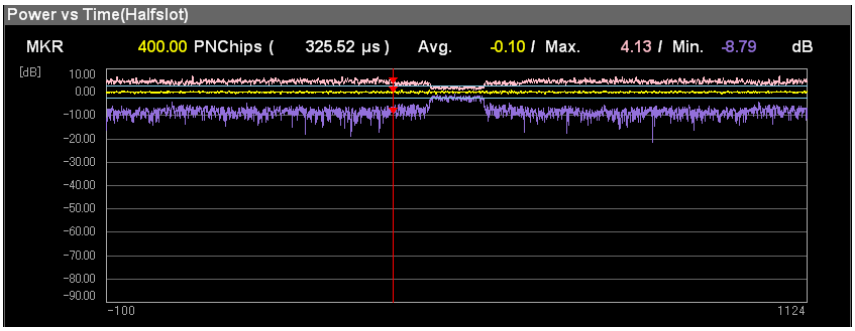

Figure 3.9.1-1 Graph window

MKR

Displays the marker position.

Avg.

Displays the power at the marker on the average waveform.

Max.

Displays the power at the marker on the maximum waveform.

Min.

Displays the power at the marker on the minimum waveform.

3.9.2 Numeric result window

Displays the numerical Power vs Time analysis results. The result of each analysis is displayed if the storage mode is disabled (**Storage: Mode** = **Off**), and the average analysis result is displayed if the mode is enabled (**Storage: Mode** = **On**).

☞ 3.5.2.2 “Trace”

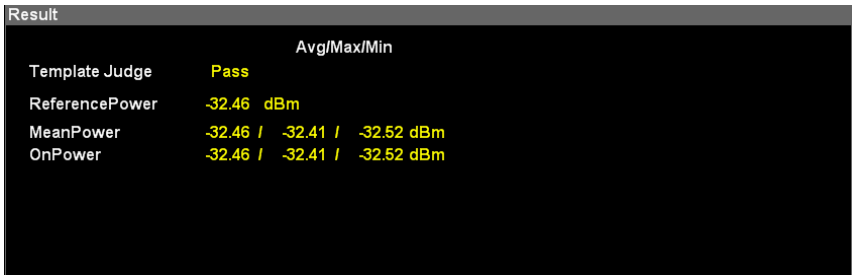

Figure 3.9.2-1 Numeric result window

Template Judge

Displays the template mask judgment result.

Reference Power

Displays the power set as 0 dB on the graph.

Mean Power

Displays the power in the first half slot area.

On Power

Displays the power in the first half slot On area.

3.10 All Measure

This feature is available when the MX269026A-001 All Measure Function option is installed.

■All Measure screen

The All Measure screen consists of the Main Result screen and the SEM Result Detail screen.

3.10.1 Main Result Screen

At All Measure function menu, press F8 (Main Result) to display the Main Result screen.

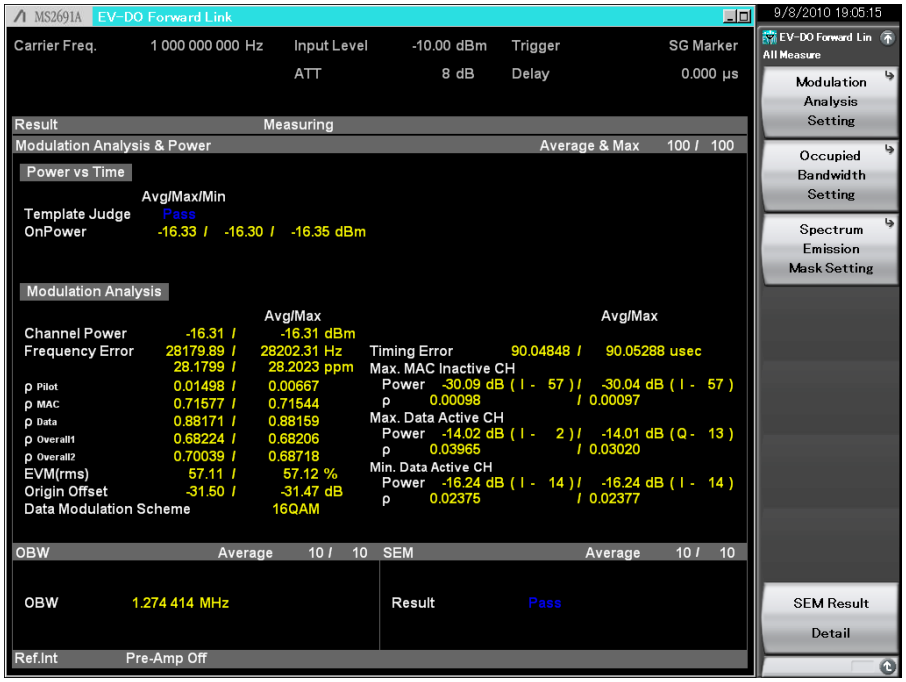

Figure 3.10.1-1 Main Result screen

Modulation Analysis & Power

Displays the measurement results for Power vs Time measurement and Modulation Analysis.

Average & Max Ex: 100/ 100

Measured Count / Measurement Count specified with Storage

☞ Table 3.5.7-2 Mod Analysis Setting function menu

Power vs Time

Displays the result of the Power vs Time measurement.

Template Judge

Displays the judgement result of Template Mask.

On Power

Displays the power in the first half slot On area.

Modulation Analysis

Displays the Modulation Analysis results.

Channel Power

Measures the Channel Power (FFT).

Frequency Error

Displays the frequency error.

ρ pilot

Displays ρ in the pilot area.

ρ MAC

Displays ρ in the MAC area.

ρ Data

Displays ρ in the data area. Displays when Slot Type is Active.

ρ overall1

Displays ρ in the first half slot area. Displays when Slot Type is Active.

ρ overall2

Displays ρ in the half slot area centered on the first chip in the second half slot area. Displays when Slot Type is Active.

EVM(rms)

Displays the average EVM.

Origin Offset

Displays average origin offset value.

Data Modulation Scheme

Displays the modulation mode for the data area. Displays when Slot Type is Active.

Timing Error

Displays the difference between the index specified for PN Offset for the RF input and the trigger input. This is displayed if Trigger Switch is On.

Max. MAC Inactive CH

Displays the maximum inactive channel in the MAC area.

Max. MAC Inactive CH: Power

Displays the maximum power among the inactive channels in the MAC area.

Max. MAC Inactive CH : ρ

Displays the maximum ρ among the inactive channels in the MAC area.

Max. Data Active CH

Displays the maximum active channel in the data area. Displays when Slot Type is Active.

Max. Data Active CH: Power

Displays the maximum power among the active channels in the data area. Displays when Slot Type is Active.

Max. Data Active CH : ρ

Displays the maximum ρ among the active channels in the data area. Displays when Slot Type is Active.

Min. Data Active CH

Displays the minimum active channel in the data area. Displays when Slot Type is Active.

Min. Data Active CH: Power

Displays the minimum power among the active channels in the data area. Displays when Slot Type is Active.

Min. Data Active CH: ρ

Displays the minimum ρ among the active channels in the data area. Displays when Slot Type is Active.

OBW

The occupied bandwidth measurement results are displayed in the Occupied Bandwidth field.

OBW : Average Ex: 10/10

Measured Count / Measurement Count specified with Storage

☞ Table 3.5.7-5 OBW Setting function menu

OBW

Displays OBW (FFT) measured results.

SEM

The spectrum emission mask measurement results are displayed in the Spectrum Emission Mask field.

If a parameter that must be reloaded is changed while measurement is stopped, the measurement results return to their initial values (and "***" is displayed for Result).To update the limit line, press Single to perform measurement again.

SEM : Average Ex: 10/ 10

Measured Count / Measurement Count specified with Storage

☞ Table 3.5.7-6 SEM Setting function menu

Result

Displays Pass/Fail result for SEM. "PASS" is displayed if all offset values were judged to pass. Otherwise, "FAIL" is displayed.

3.10.2 SEM Result Detail Screen

At All Measure function menu, press F8 (SEM Result Detail) to display the SEM Result screen.

Figure 3.10.2-1 SEM Result Detail Screen

SEM

Displays the spectrum emission mask measurement results.

Average Ex: 10/10

Measured Count / Measurement Count specified with Storage

☞ Table 3.5.7-6 SEM Setting function menu

Spectrum emission mask

Indicates measurement items.

Result

Displays Pass/Fail result for SEM. “PASS” is displayed if all offset values were judged to pass. Otherwise, “FAIL” is displayed.

Reference

Displays reference power.

Offset

Displays the frequency offset from the center frequency.

Start (MHz)

Displays the measurement start location (frequency) from the center frequency.

Stop (MHz)

Displays the measurement end location (frequency) from the center frequency.

Lower

Displays the results of the offset values on the left of Reference. If the limit line is set up, the frequency (Freq(MHz)) at which the value of (limit line – measured value) becomes minimized is displayed, as well as the level if Result Type is Peak (measured value: Peak (dBm)) or the margin if Result Type is Margin (limit line – measured value: Margin (dBm)).

Upper

Displays the results of the offset values on the right of Reference. If the limit line is set up, the frequency (Freq(MHz)) at which the value of (limit line – measured value) becomes minimized is displayed, as well as the level if Result Type is Peak (measured value: Peak (dBm)) or the margin if Result Type is Margin (limit line – measured value: Margin (dBm)).

Chapter 4 Performance Test

This chapter describes 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 the performance degradation before it occurs.

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. 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 subject testing device and measuring instruments for at least 30 minutes except where directed, in order to stabilize them sufficiently before running performance tests. Demonstrating maximum measurement accuracy requires, in addition to the above, conducting performance tests under ambient temperatures, little AC power supply voltage fluctuations, as well as the absence of noise, vibrations, dust, humidity or other problems.

4.2.1 Testing methods

(1) Test target standards

- Carrier frequency accuracy
- Residual EVM

(2) Measuring instrument for tests

- Vector signal generator
- Frequency standard device — Unnecessary if signal source has sufficient frequency accuracy
- Power meter — Unnecessary if signal source has sufficient transmitter power accuracy

(3) Setup

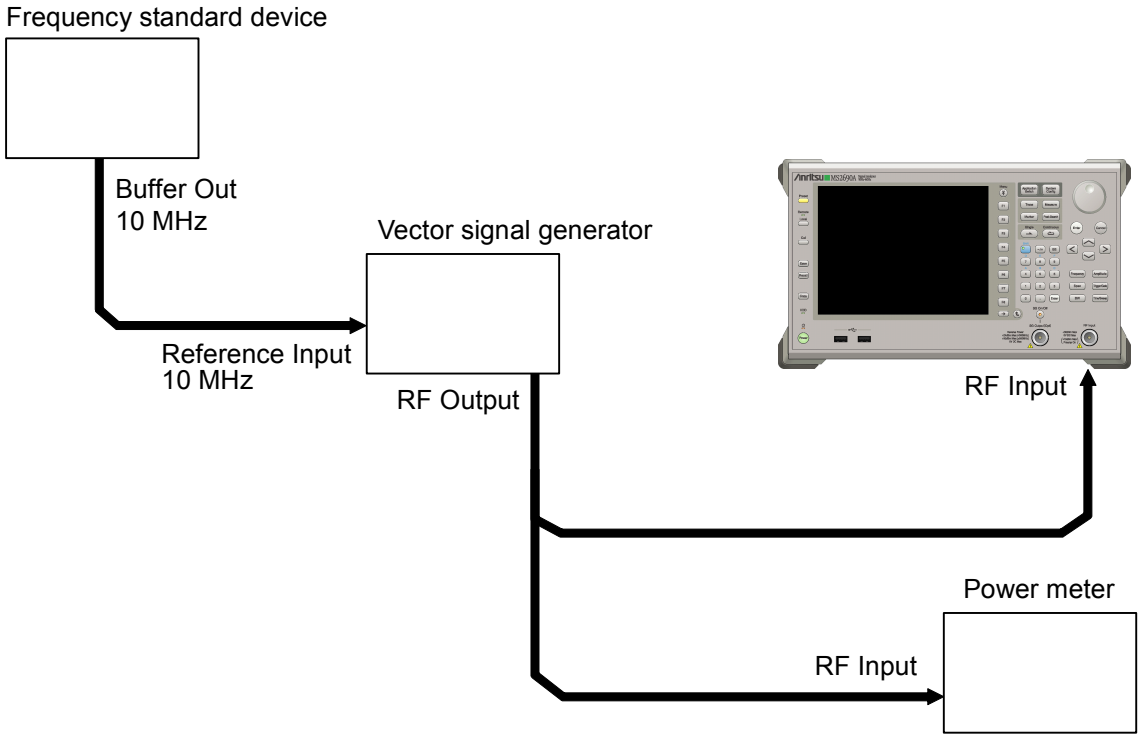

Figure 4.2.1-1 Performance test

(4) Test Procedure

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. Input the 10-MHz reference signal output from the frequency standard device into the Reference Input connector of the vector signal generator.
3. Input the 10 MHz reference signal output from the signal generator to the Reference Input connector.
4. Press Preset.
5. Press F1 (Preset) to initialize.
6. Press Cal.
7. Press F1 (SIGANA All) to perform calibration.
8. Press F8 (Close).
9. Configure the Vector Signal Generator as follows; and output EV-DO Forward Link signal. If using the MG3700A as a vector signal generator, use the FWD_614_4kbps_1slot of Package CDMA2000_1xEV-DO as waveform.
   - Frequency : 400 MHz
   - Level : –15 dBm
10. Set the main unit as follows.
    - Center Frequency : 400 MHz
    - Input Level : –15 dBm
    - Physical Channel Subtype : Sub Type 0
    - Slot Type : Active
    - Storage Mode : Average
    - Storage Count : 10
11. Input the signal output from the vector signal generator into the power meter, adjust the output level so that the power reading falls between –15 dBm ± 0.1 dB.
12. Input the signal output from the vector signal generator into the MS2690A/MS2691A/MS2692A or MS2830A.

13. Press [Single] to measure.

    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).

14. Confirm that the maximum Frequency Error (carrier frequency accuracy) value is within the specifications.

15. Confirm that the measured EVM (rms) (residual vector error) average values satisfy the specifications.

16. Set the frequency of the vector signal generator and MS2690A/MS2691A/MS2692A or MS2830A to 900 MHz, and repeat Steps 11 through 15.

17. Set the frequency of the vector signal generator and MS2690A/MS2691A/MS2692A or MS2830A to 2000 MHz, and repeat Steps 11 through 15.

18. Set the frequency of the vector signal generator and MS2690A/MS2691A/MS2692A or MS2830A to 2700 MHz, and repeat Steps 11 through 15.

(5) Test Result

Table 4.2.1-1 Carrier frequency accuracy

Frequency	Min. limit	Deviation (Hz)	Max. limit	Uncertainty	Pass/Fail
400 MHz	–10 Hz		+10 Hz	±1 Hz	
900 MHz					
2000 MHz					
2700 MHz					

Table 4.2.1-2 Residual EVM

Frequency	Measured value [% (rms)]	Max. limit	Uncertainty	Pass/Fail
400 MHz		MS269xA 1.0 % (rms) MS2830A 1.5 % (rms)	MS269xA 0.1 % (rms) MS2830A 0.1 % (rms)	
900 MHz				
2000 MHz				
2700 MHz				

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 Default Value List

Frequency	
Carrier Frequency	1.000 GHz
RF Spectrum	Norm
Amplitude	
Input Level	–10.00 dBm
Pre-Amp	Off
Offset	Off
Offset Value	0.00 dB
Common Setting	
Physical Layer Subtype	Subtype0/1
Slot Type	Active
Modulation Type	Auto
Preamble Length	Auto
PN Offset	0 × 64 Chip
Active Code Threshold	–30.0 dB
Measure : Code Domain	
Branch	I
Code Number I	0
Code Number Q	0
Measure : Code Domain : Trace	
Code Domain Channel Type	MAC
Scale	20 dB
Storage	
Mode	Off
Count	10
Display Mode	Walsh
Smoothing	Off
Measure : Power vs Time	
Select Reference Line	On Power
Reference Line Level	0.00 dBm
Select Mask	Standard
Unit	dB
Display Item	All
Filter Type	Flattop

Measure : Power vs Time : Mask Setup	
Upper Limit	2.50 dB
Lower Limit	–2.50 dB
Upper Limit Out of Burst	–7.00 dB
Measure : Power vs Time : Trace	
Trace Mode	Halfslot
Target Halfslot	Full slot
Scale	100 dB
Storage	
Mode	Off
Count	10
Marker (Measure : Code Domain)	
Branch	I
Code Number I	0
Code Number Q	0
Marker (Measure : Power vs Time)	
Marker	On
Marker Number	400.00 PNChip
Trigger	
Trigger Switch	Off
Trigger Source	External
Trigger Slope	Rise
Trigger Delay	0 s
Accessory	
Title	On, "EV-DO Forward Link"

References are to section numbers.

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