# MX269015A
# TD-SCDMA Measurement Software
# Operation Manual
# Operation

**Ninth 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 (Main Frame Operation), the MS2830A Signal Analyzer Operation Manual (Main Frame Operation) or the MS2850A Signal Analyzer Operation Manual (Main Frame Operation). Please also refer to them before using the equipment.**
- **Keep this manual with the equipment.**

**ANRITSU CORPORATION**

Document No.: M-W3044AE-9.0

# Safety Symbols

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

## Symbols used in manual

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

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

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

## Safety Symbols Used on Equipment and in Manual

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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.

MX269015A
TD-SCDMA Measurement Software
Operation Manual Operation

7 February 2008 (First Edition)
30 September 2020 (Ninth 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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### Article 8. Responsibility after Termination

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### Article 9. Negotiation for Dispute Resolution

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### Revision History:

February 29th, 2020

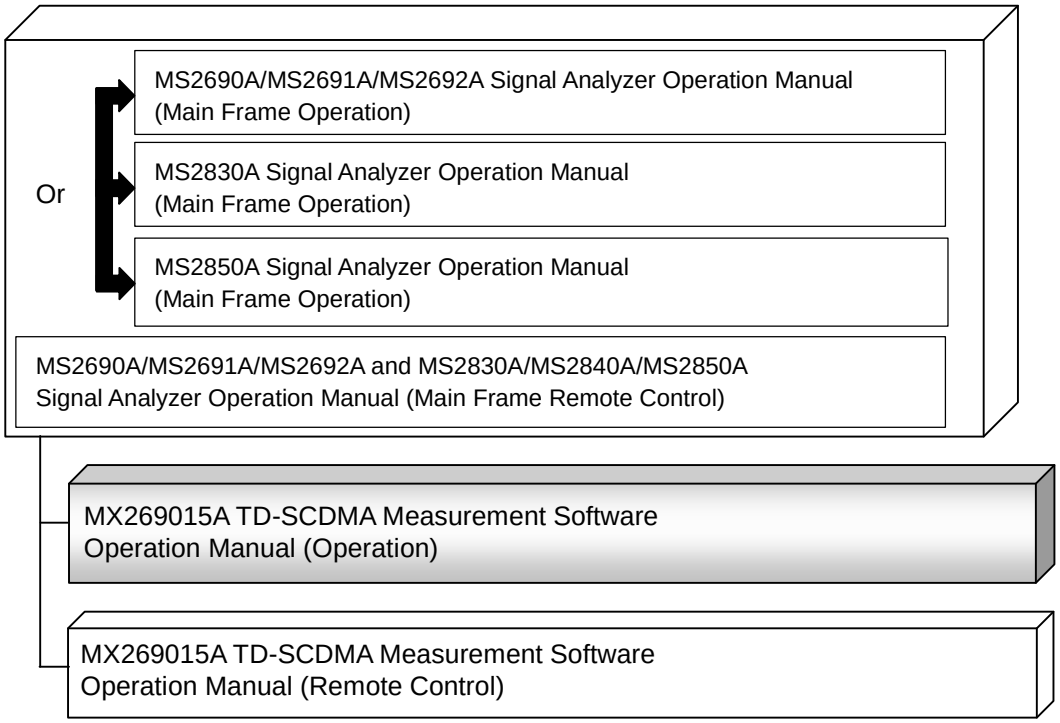
## Cautions Against Computer Virus Infection

- 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 MX269015A TD-SCDMA Measurement Software are composed as shown in the following figure.




- Signal Analyzer Operation Manual (Main Frame Operation)
- Signal Analyzer Operation Manual (Main Frame Remote Control)

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

- TD-SCDMA Measurement Software Operation Manual (Operation)

<This document>

This manual describes basic operating methods and functions of the MX269015A TD-SCDMA Measurement Software.

- TD-SCDMA Measurement Software Operation Manual (Remote Control)

This manual describes remote control of the MX269015A TD-SCDMA 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, MS2850A.

In this document, indicates a panel key.

# Table of Contents


**About This Manual..... I**

**Chapter 1 Overview..... 1-1**

1.1 Product Overview..... 1-2
1.2 Product Configuration ..... 1-3
1.3 Specifications..... 1-4

**Chapter 2 Preparation..... 2-1**

2.1 Part Names ..... 2-2
2.2 Signal Path Setup ..... 2-14
2.3 Application Startup and Selection..... 2-15
2.4 Initialization and Calibration..... 2-16

**Chapter 3 Measurement ..... 3-1**

3.1 Basic Operation ..... 3-2
3.2 Setting Frequency..... 3-5
3.3 Setting Level ..... 3-7
3.4 Setting Common Items ..... 3-9
3.5 Setting Measurement Items..... 3-13
3.6 Setting Marker..... 3-24
3.7 Setting Trigger ..... 3-26
3.8 EVM Display ..... 3-27
3.9 Constellation Display ..... 3-29
3.10 Code Domain Power vs Code Number Display..... 3-30
3.11 Code Domain Error vs Code Number Display..... 3-31
3.12 Multi Slot Power Display ..... 3-32
3.13 Multi Carrier Power Display ..... 3-33
3.14 Power vs Time Display ..... 3-34

**Section 4 Performance Test ..... 4-1**

4.1 Overview of Performance Test ..... 4-2

4.2 Performance Test Items..... 4-3

**Section 5 Other Functions ..... 5-1**

5.1 Selecting Other Functions..... 5-2

5.2 Setting Title ..... 5-2

5.3 Erasing Warmup Message ..... 5-2

**Appendix A Error Messages..... A-1**

**Appendix B Initial Values..... B-1**

**Index ..... Index-1**

# Chapter 1 Overview



This chapter overviews the MX269015A TD-SCDMA Measurement Software and describes the product configuration.

1.1 Product Overview ..... 1-2
1.2 Product Configuration ..... 1-3
1.2.1 Standard configuration ..... 1-3
1.2.2 Application parts ..... 1-3
1.3 Specifications ..... 1-4

# 1.1 Product Overview

The MS269x Series, MS2830A or MS2850A Signal Analyzer supports high-speed, high-accuracy, and easy measurement of the transmission characteristics of base stations and mobile stations for various mobile communications standards. The MS269x Series, MS2830A or MS2850A Signal Analyzer has a high-performance signal analyzer and spectrum analyzer, with optional measurement software for modulation analysis supporting various digital modulation modes.

The MX269015A TD-SCDMA Measurement Software option (MX269015A) is for measuring the RF characteristics of 3GPP TD-SCDMA, low-chip-rate technologies (1.28 Mcps).

The MX269015A supports the following measurements.

- Modulation accuracy
- Carrier frequency
- Transmitter power

MS2830A-006/106 is required to use the MX269015A on MS2830A.

# 1.2 Product Configuration

## 1.2.1 Standard configuration

Table 1.2.1-1 lists the MX269015A standard configuration.

**Table 1.2.1-1 Standard Configuration**

| Item | Model/Code | Name | Qty | Remarks |
|---|---|---|---|---|
| Application | MX269015A | TD-SCDMA Measurement Software | 1 | |
| Accessory | — | Installation CD-ROM | 1 | Application software, operation manual CD-ROM |

## 1.2.2 Application parts

Table 1.2.2-1 lists the MX269015A application parts.

**Table 1.2.2-1 Application Parts**

| Model/Code | Name | Remarks |
|---|---|---|
| W3044AE | MX269015A TD-SCDMA Measurement Software Operation Manual (Operation) | English, hard copy |
| W3045AE | MX269015A TD-SCDMA Measurement Software Operation Manual (Remote Control) | English, hard copy |

# 1.3 Specifications

Table 1.3-1 lists the MX269015A specifications.

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 | Specifications |
|---|---|
| Common Specifications | |
| Target signals | Uplink and Downlink |
| Modulation/Frequency/Amplitude Measurement | |
| Measurement frequency ranges | 1850 to 2620 MHz |
| Measurement level range | [Modulation/Frequency Measurement]<br>MS269x Series/ MS2830A/ MS2850A<br>–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.)<br>–30 to +10 dBm (at Pre-Amp On)<br><br>[Amplitude Measurement]<br>MS269x Series<br>–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.)<br>–30 to +10 dBm (at Pre-Amp On)<br>MS2830A<br>–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.)<br>MS2850A<br>–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) |
| Carrier frequency accuracy | After CAL at 18 to 28°C, for 1% EVM signal<br>± (accuracy of reference crystal oscillator × carrier frequency + 20 Hz) |
| Residual EVM | After CAL at 18 to 28°C, the measured signal is within the measurement level range and below the value set at Input Level.<br>MS269x Series: ≤ 1.0% (rms)<br>MS2830A: ≤ 1.2% (rms)<br>MS2850A: ≤ 1.2% (rms) |
| Code Domain Power | After CAL at 18 to 28°C, the measured signal is within the measurement level range and below the value set at Input Level.<br>±0.18 dB (Code Power ≥ –10dBc)<br>±0.32 dB (Code Power ≥ –30dBc) |
| Code Domain Error | After CAL at 18 to 28°C, the measured signal is within the measurement level range and below the value set at Input Level.<br>±1.00 dB (Code Error ≥ –40dBc) |
| Residual Code Domain Error | After CAL at 18 to 28°C, the measured signal is within the measurement level range and below the value set at Input Level.<br>≤ –40 dB |

**Table 1.3-1 Specifications (Cont'd)**

| Item | Specifications |
|---|---|
| Transmitter power accuracy | After CAL, input attenuator ≥10 dB, at 18 to 28°C, the measured signal is within the measurement level range and below the value set at Input Level.<br>MS269x Series<br>±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)<br>±1.1 dB (at Pre-Amp On)<br>MS2830A<br>±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)<br>MS2850A<br>±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)<br>Transmitter power accuracy is calculated from the RSS (root sum square) error of the absolute amplitude accuracy and the in-band frequency characteristics. |
| Waveform displays | Constellation<br>Code Domain Power vs Code Number<br>Code Domain Error vs Code Number |
| Adjacent Channel Power Measurement | |
| Measurement method | Executes adjacent channel power measurement function of spectrum analyzer or signal analyzer |
| Occupied Bandwidth Measurement | |
| Measurement method | Executes occupied bandwidth measurement function of spectrum analyzer or signal analyzer |
| Spectrum Emission Mask Measurement | |
| Measurement method | Executes spectrum emission mask measurement function of spectrum analyzer |
| Power vs Time | Provides measurements for Transmitter OFF Power and Time Mask<br>This function can be used only in MS269x series. |
| Dynamic Range | MS269x series<br>≥ 126 dB (nominal)<br>(This nominal value is valid when Wide Dynamic Range is On and Noise Correction is On.) |

# 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.


2.1 Part Names ..... 2-2
2.1.1 Front panel ..... 2-2
2.1.2 Rear panel ..... 2-9
2.2 Signal Path Setup ..... 2-14
2.3 Application Startup and Selection ..... 2-15
2.3.1 Launching application ..... 2-15
2.3.2 Selecting application ..... 2-15
2.4 Initialization and Calibration ..... 2-16
2.4.1 Initialization ..... 2-16
2.4.2 Calibration ..... 2-16

# 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.

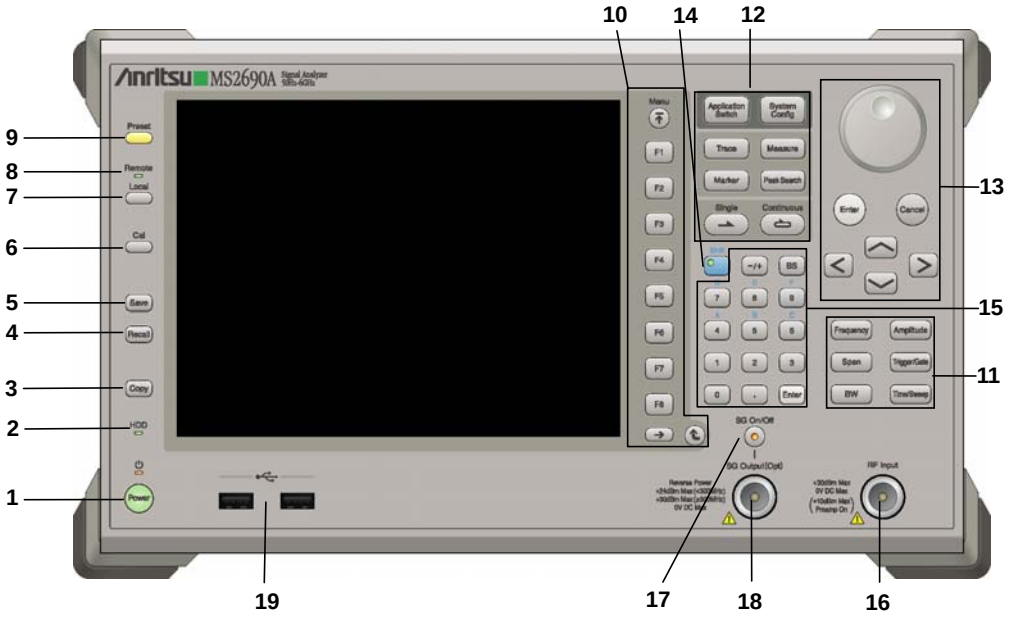



**Figure 2.1.1-1 MS269x series front panel**

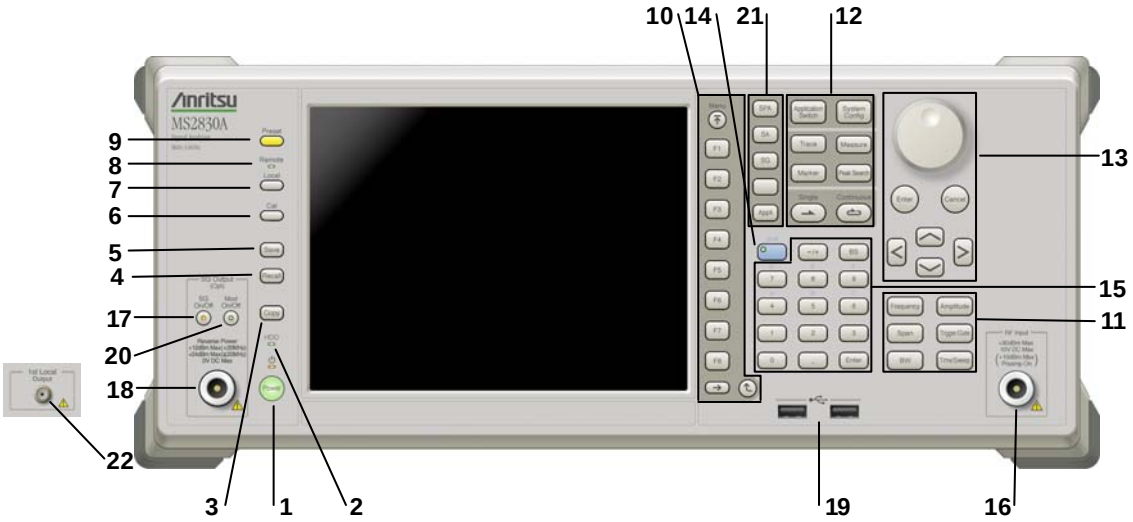



**Figure 2.1.1-2 MS2830A/MS2850A front panel (MS2830A Example)**

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.

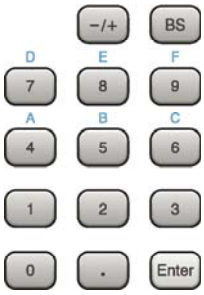
Press Cancel to cancel input or selected data.

**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 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**

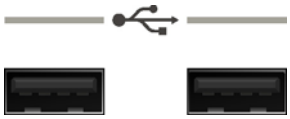
RF Output Control key (when MS269xA-020/120, MS2830A-020/120/021/121 is installed)

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** Mod On/Off

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.

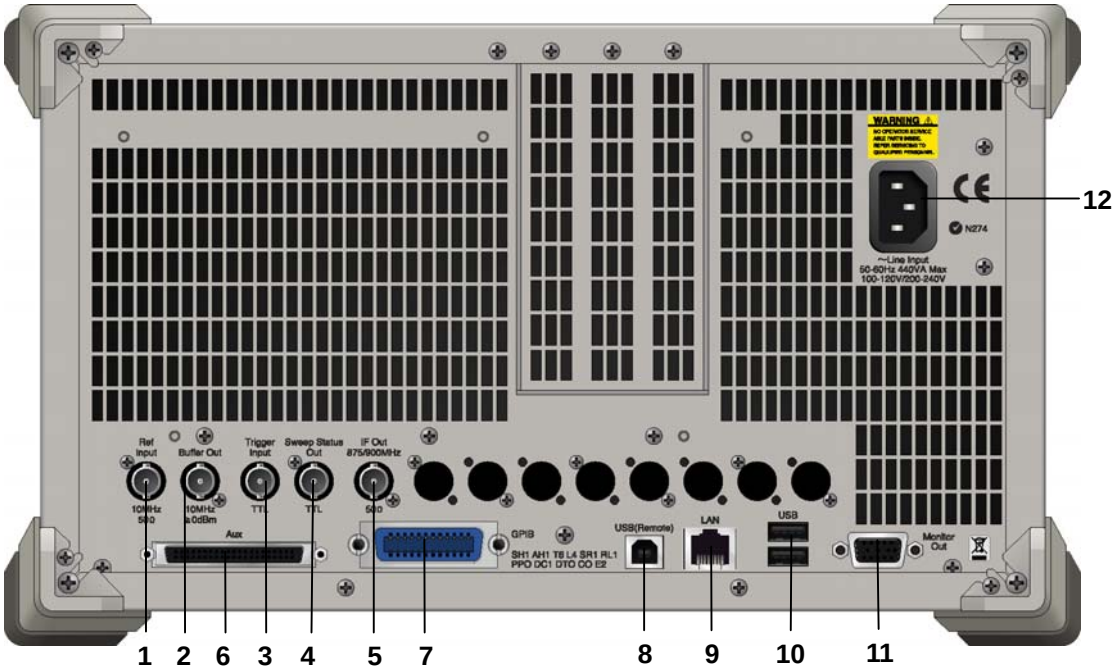



**Figure 2.1.2-1 MS269x series rear panel**

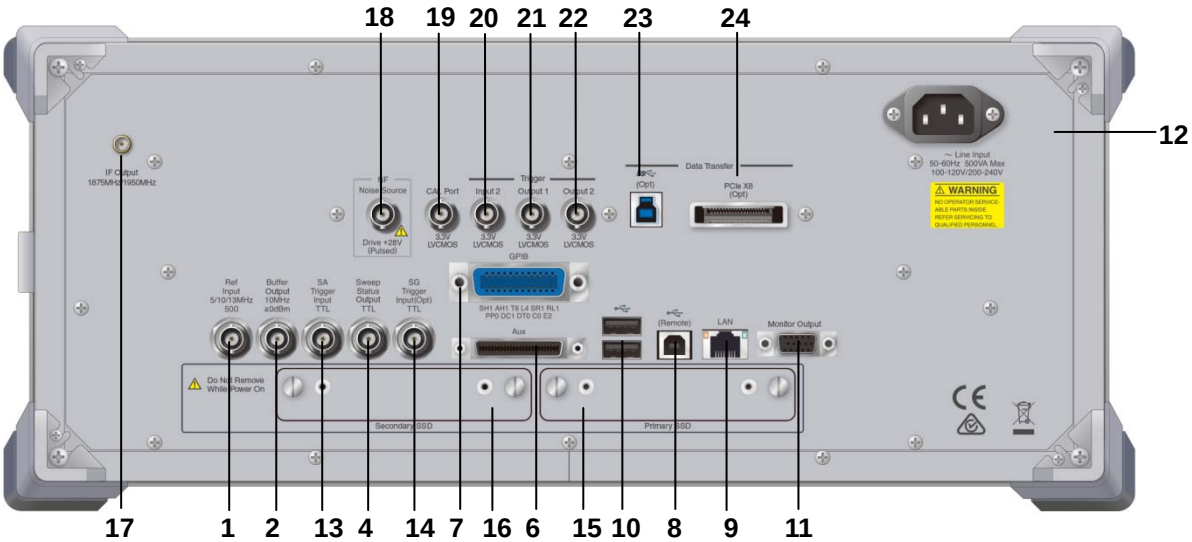



**Figure 2.1.2-2 MS2830A/MS2850A rear panel (MS2850A Example)**

**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)

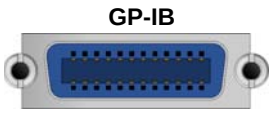
Not used.

**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)<br>SSD slot (MS2850A) | This is a standard HDD slot.<br>This is a standard SSD slot. |
| **16** | **HDD(Opt)** or **Secondary HDD/SSD** | HDD slot for Option (MS2830A)<br>SSD slot (MS2850A) | This is a HDD slot for the options.<br>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**

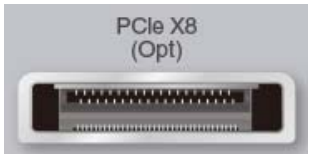
Trigger Output 1 connector (MS2850A)
Output the trigger signal (3.3 V LVCMOS).

**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.

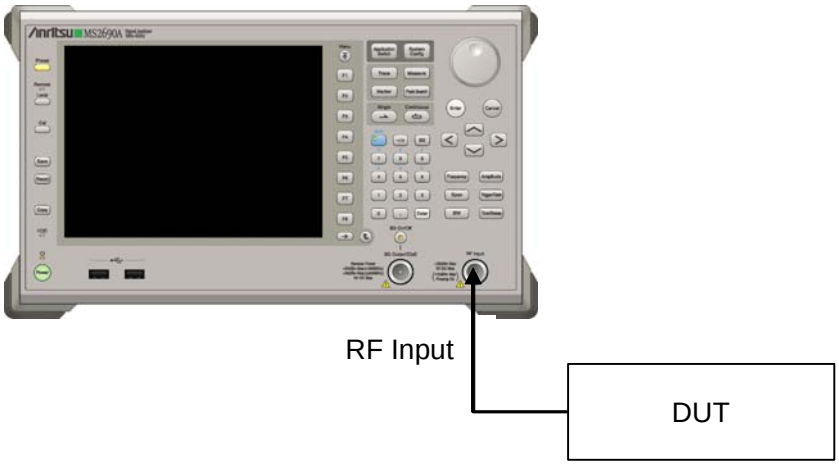



**Figure 2.2-1 Signal path setup example**

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

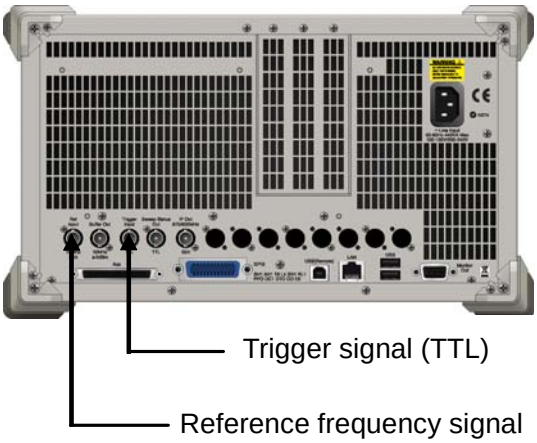



**Figure 2.2-2 External signal input**

# 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 setting methods for the MX269015A.


3.1 Basic Operation ..... 3-2
3.1.1 Screen layout ..... 3-2
3.1.2 Function menu ..... 3-3
3.1.3 Measuring ..... 3-4
3.2 Setting Frequency ..... 3-5
3.3 Setting Level ..... 3-7
3.4 Setting Common Items ..... 3-9
3.5 Setting Measurement Items ..... 3-13
3.5.1 Modulation Analysis ..... 3-13
3.5.2 Power vs Time ..... 3-16
3.5.3 Adjacent Channel Power Measurement (ACP) ..... 3-21
3.5.4 Occupied Bandwidth Measurement (OBW) ..... 3-22
3.5.5 Spectrum Emission Mask (SEM) ..... 3-23
3.6 Setting Marker ..... 3-24
3.6.1 Modulation Analysis ..... 3-24
3.6.2 Power vs Time ..... 3-24
3.7 Setting Trigger ..... 3-26
3.8 EVM Display ..... 3-27
3.9 Constellation Display ..... 3-29
3.10 Code Domain Power vs Code Number Display ..... 3-30
3.11 Code Domain Error vs Code Number Display ..... 3-31
3.12 Multi Slot Power Display ..... 3-32
3.13 Multi Carrier Power Display ..... 3-33
3.14 Power vs Time Display ..... 3-34

# 3.1 Basic Operation

## 3.1.1 Screen layout

This section describes the MX269015A screen layout.

**Fig. 3.1.1-1 Screen Layout**

[1] Measurement parameter
Displays set parameters

[2] Status message
Displays status of signals

[3] Constellation
Displays Constellation for selected symbol

[4] Result window
Displays measurement results

[5] Function menu
Displays functions executed with function keys

[6] Graph window
Displays graph of measurement results

## 3.1.2 Function menu

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

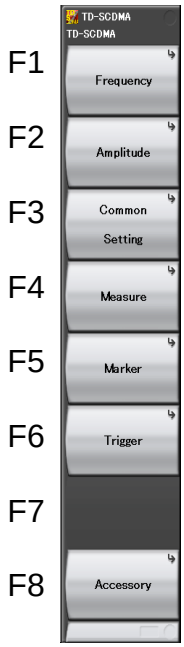



**Fig. 3.1.2-1 Main Function Menu**

**Table 3.1.2-1 Main Function Menu**

| Menu Display | Function |
|---|---|
| Frequency | Sets frequency<br>3.2 Setting Frequency |
| Amplitude | Sets level<br>3.3 Setting Level |
| Common Setting | Sets common items<br>3.4 Setting Common Items |
| Measure | Sets measurement items<br>3.5 Setting Measurement Items |
| Marker | Sets marker<br>3.6 Setting Marker |
| Trigger | Sets trigger<br>3.7 Setting Trigger |
| Accessory | Sets other functions<br>5.1 Selecting Other Functions |

## 3.1.3 Measuring

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

<u>Single</u>
Selected measurement items are measured only for the measurement count (Storage Count) before measurement is stopped.

<Procedure>
1. Press .

<u>Continuous</u>
Selected measurement items are measured continuously for the measurement count (Storage Count). Measurement continues even when parameters or the window display are changed. Measurement stops when other applications are selected.

<Procedure>
1. Press .

# 3.2 Setting Frequency

Pressing F1 (Frequency) at the main function menu displays the Frequency function menu. Pressing Frequency opens the Carrier Frequency dialog box or the Center Frequency dialog box and displays the Frequency function menu.

Carrier Frequency

■ Summary

Sets carrier frequency of target carrier in Carrier Frequency mode

***Note***

When more than one carrier is measured (Carrier Number >1), setting the carrier frequency of the target carrier automatically sets the carrier frequencies of the other carriers (at 1.6-MHz spacing) and the center frequency.

☞ 3.4 Setting Common Items

■ Setting range

100 MHz to the upper limit of MS269x Series, MS2830A or MS2850A

***Note***

Minimum and maximum setting ranges vary with the number of measured carriers (Carrier Number) and target carrier.

☞ 3.4 Setting Common Items

Center Frequency

■ Summary

Sets center frequency of multi-carriers in Center Frequency mode

***Note***

When more than one carrier is measured (Carrier Number >1), setting the center frequency automatically sets the carrier frequencies of all carriers (1.6-MHz spacing). Also, when only one carrier is measured (Carrier Number = 1), the center frequency is the same as the carrier frequency.

☞ 3.4 Setting Common Items

■ Setting range

100 MHz to the upper limit of MS269x Series, MS2830A or MS2850A

***Note***

Minimum and maximum setting ranges vary with the number of measured carriers (Carrier Number).

☞ 3.4 Setting Common Items

### Frequency Mode

■ Summary

Selects Frequency mode

The Frequency mode selects whether the carrier frequency or center frequency is set.

■ Selection options

Carrier Frequency

Center Frequency

# 3.3 Setting Level

Pressing F2 (Amplitude) at the main function menu displays the Amplitude function menu. Pressing Amplitude opens the Input Level dialog box and displays the Amplitude function menu.

Input Level

■ Summary

Sets input level from target DUT

■ Setting range

With Pre-Amp On or Pre-Amp Mode On at Power vs Time measurement:
(–80.00 + Offset Value) to (10.00 + Offset Value) dBm
With Pre-Amp Off:
(–60.00 + Offset Value) to (30.00 + Offset Value) dBm

Pre-Amp

■ Summary

Sets Pre-Amp function on/off

***Note:***

If Wide Dynamic Range is set to On at Power vs Time, the Pre-Amp function is switched forcefully to Off.

Offset

■ Summary

Sets Offset function on/off

Offset Value

■ Summary

Sets level offset coefficient

■ Setting range

–99.99 to 99.99 dB

■ Setting example

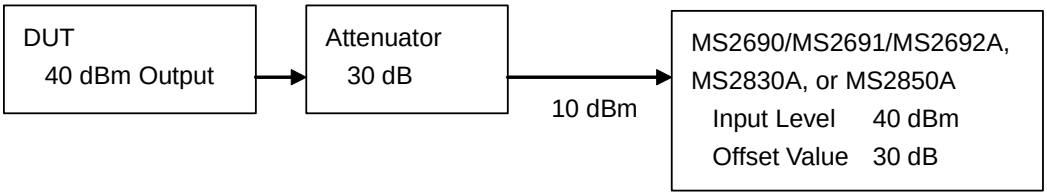



**Fig. 3.3-1 Input Level and Offset Level Setting Example**

Auto Range

■ Summary

This function adjusts input level according to input signal.

# 3.4 Setting Common Items

Pressing F3 (Common Setting) at the main function menu displays the Common Setting function menu.

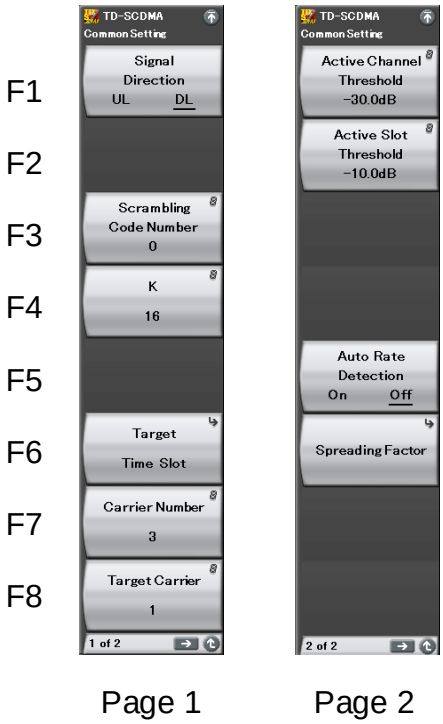



**Fig. 3.4-1 Common Setting Function Menu**

**Table 3.4-1 Common Setting Function Menu**

| Menu Display | Function |
|---|---|
| Signal Direction | Selects measured target signal direction |
| Scrambling Code Number | Sets Scrambling Code Number |
| K | Sets value of K (number of maximum users) |
| Target Time Slot | Selects analyzed Time Slot |
| Carrier Number | Sets the number of measured carriers |
| Target Carrier | Sets analyzed carrier |
| Active Channel Threshold | Sets Active Channel Threshold value |
| Active Slot Threshold | Sets Active Slot Threshold value |
| Auto Rate Detection | Selects Auto Rate detection mode |
| Spreading Factor | Sets Spreading factor |

Signal Direction

■ Summary

Selects measured target signal direction

■ Selection options

| | |
|---|---|
| UL | Analyzes Uplink input signal |
| DL | Analyzes Downlink input signal |

Scrambling Code Number

■ Summary

Sets Scrambling Code Number

■ Setting range

0 to 127

K

■ Summary

Sets value of K (number of maximum users)

■ Setting range

2, 4, 6, 8, 10, 12, 14, 16

Target Time Slot

■ Summary

Selects analyzed Time Slot

■ Selection options

| | |
|---|---|
| Time Slot 0 | Analyzes Time Slot 0 |
| Time Slot 1 | Analyzes Time Slot 1 |
| Time Slot 2 | Analyzes Time Slot 2 |
| Time Slot 3 | Analyzes Time Slot 3 |
| Time Slot 4 | Analyzes Time Slot 4 |
| Time Slot 5 | Analyzes Time Slot 5 |
| Time Slot 6 | Analyzes Time Slot 6 |
| Burst | With waveform imported by measuring instrument, analyzes initial time slot |

***Note***

When Target Time Slot is set to Burst, Trace Mode cannot be set to Multi Slot Power and Multi Carrier Power.

☞ 3.5.1.1 Trace Mode

Carrier Number

■ Summary

Sets number of measured carriers

■ Setting range

1 to 6

***Note***

In the Carrier Frequency Mode, changing Carrier Number automatically changes the center frequency (the carrier frequency of the target carrier is unchanged).
In the Center Frequency Mode, changing Carrier Number automatically changes the carrier frequencies of all carriers (the center frequency is unchanged).
The maximum carrier number depends on the frequency settings.

☞ 3.2 Setting Frequency

Target Carrier

■ Summary

Sets analyzed carrier

■ Setting range

1 to Carrier Number

***Note***

When measuring more than one carrier (Carrier Number >1), carriers are numbered 1 to N (N = set Carrier Number), with 1 as the lowest frequency carrier and N as the highest frequency carrier.

Active Channel Threshold

■ Summary

Sets Active Channel Threshold value

■ Setting range

–5.0 to –50.0 dB

***Note***

In the Code Domain Graph display, a yellow bar means the code domain power of a channel is equal to or more than the Active Channel Threshold value; a blue bar means it is less than the Active Channel Threshold value.

### Active Slot Threshold

■ Summary

Sets Active Slot Threshold value

■ Setting range

–10.0 to –50.0 dB

***Note***

At the measurement results display, "***.**" means the power for that Time Slot is less than the Active Slot Threshold value.

### Auto Rate Detection

■ Summary

Selects Auto Rate Detection mode

■ Selection options

| | |
|---|---|
| On | Enables Auto Rate Detection |
| Off | Disables Auto rate Detection |

### Spreading Factor

■ Summary

Sets Spreading Factor value when Auto Rate Detection disabled

■ Setting range

1, 2, 4, 8, 16

# 3.5 Setting Measurement Items

Pressing F4 (Measure) at the main function menu or Measure displays the measure function menu.

## 3.5.1 Modulation Analysis

Pressing F1 (Modulation Analysis) at the measure function menu displays the Modulation Analysis function menu.

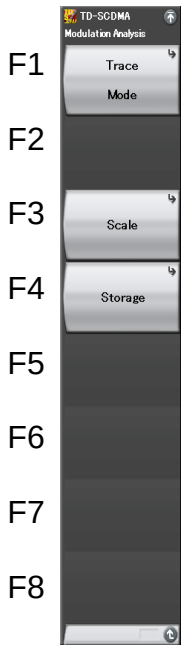



**Fig. 3.5.1-1 Modulation Analysis Function Menu**

**Table 3.5.1-1 Modulation Analysis Function Menu**

| Menu Display | Function |
|---|---|
| Trace Mode | Sets type of result displayed in graph window ☞ 3.5.1.1 Trace Mode |
| Storage | Sets storage method |
| Scale | Sets vertical scale of graph result |

### Storage

■ Summary

Sets storage method

■ Selection options

| | |
|---|---|
| Mode | Sets storage mode |
| Count | Sets measurement count |

### Storage: Mode

■ Summary

Sets storage mode

■ Selection options

| | |
|---|---|
| Off | Updates data at every sweep |
| Average | Displays average for every sweep |
| Average & Max | Displays average and maximum values for every sweep |

### Storage: Count

■ Summary

Sets measurement count

■ Setting range

2 to 9999

### Scale

■ Summary

Sets vertical scale of graph result

■ Selection options

| | |
|---|---|
| Code Domain Power Scale | Sets scale for Code Domain Power |
| Code Domain Error Scale | Sets scale for Code Domain Error |

### Scale: Code Domain Power Scale

■ Summary

Sets scale for Code Domain Power vs Code Number Display

■ Setting range

| | |
|---|---|
| 20 dB | –20 to 0 dB |
| 40 dB | –40 to 0 dB |
| 60 dB | –60 to 0 dB |
| 80 dB | –80 to 0 dB |

Scale: Code Domain Error Scale

■ Summary

Sets scale for Code Domain Error vs Code Number Display

■ Setting range

| | |
|---|---|
| 20 dB | –80 to –60 dB |
| 40 dB | –80 to –40 dB |
| 60 dB | –80 to –20 dB |
| 80 dB | –80 to 0 dB |



### 3.5.1.1 Trace Mode

Pressing F1 (Trace Mode) at the Modulation Analysis function menu or Trace displays the Trace Mode function menu.

Trace Mode

■ Summary

Sets type of result displayed in graph window

■ Selection options

| | |
|---|---|
| Code Domain Power | Displays Code Domain Power vs Code number in graph window |
| Code Domain Error | Displays Code Domain Error vs Code number in graph window |
| Multi Slot Power | Displays Subframe Power, Mean, Data1, Midamble and Data2 Powers vs Slot number in table form |
| Multi Carrier Power | Displays all Carrier Powers vs Slot number in table form |

***Note***

When Trace Mode is set to Multi Slot Power or Multi Carrier Power, Target Time Slot cannot be set to Burst.

☞ 3.4 Setting Common Items

## 3.5.2 Power vs Time

Pressing F2 (Power vs Time) at the measure function menu displays the Power vs Time function menu.

***Note***

1. Power vs Time can be used only in the MS269x series.

2. Power vs Time can be used when Signal Direction is set to DL.

3.4 Setting Common Items

3. The power of the measured signal in the On interval is from –30 dBm to +30 dBm when Pre-Amp Mode is Off. On the other hand, when Pre-Amp Mode is On, set it from –30 dBm to +10 dBm (Peak value).

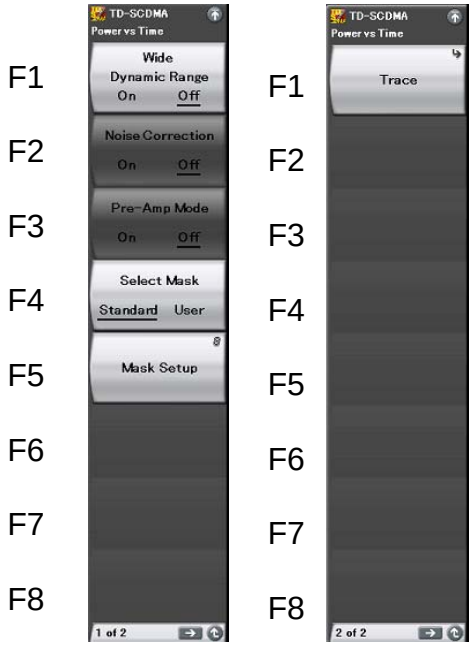



**Fig. 3.5.2-1 Power vs Time Function Menu**

**Table 3.5.1-1 Modulation Analysis Function Menu**

| Menu Display | Function |
|---|---|
| Wide Dynamic Range | Sets wide dynamic range<br>When Wide Dynamic Range is set to On, Pre-Amp is switched to Off forcefully. |
| Noise Correction | Sets whether to perform noise correction |
| Pre-Amp Mode | Sets whether to use pre-amp at Off Power measurement |
| Select Mask | Selects selection method for the Mask line |
| Mask Setup | Sets the mask. |
| Trace | Selects Smoothing or Storage |



Wide Dynamic Range

■ Summary

Sets whether to enable or disable Wide Dynamic Range

When Wide Dynamic Range is set to On, the measurement parameter is changed internally at the Off Power measurement to improve the measurement accuracy.

■ Selection options

On Enables
Off Disables

***Note***

When Wide Dynamic Range is set to On, Pre-Amp is switched to Off forcefully.
When the parameter is moved to the measurement function other than Power vs Time, Wide Dynamic Range is switched to Off.

Noise Correction

■ Summary

Sets whether to perform noise correction

■ Selection options

On Enables
Off Disables

***Note***

Noise Correction can be set only when Wide Dynamic Range is set to On.
When Wide Dynamic Range is set to Off, the Noise Correction menu is displayed in gray and the function is disabled.
Both Noise Correction and Pre-Amp Mode cannot set to On at the same time.

Pre-Amp Mode

■ Summary

Sets whether to use Pre-Amp at the Off power measurement.

■ Selection options

On Enables
Off Disables

The Pre-Amp mode can be set when Wide Dynamic Range is On and Trigger Switch is On.
When Wide Dynamic Range is set to Off, the Pre-Amp mode menu is displayed in gray and the function is disabled.
Both Pre-Amp Mode and Noise Correction cannot set to On at the same time.

When the Pre-Amp mode is set to On, input the trigger.

***Note:***

1. When the option 008 is not enabled, the Pre-Amp menu is not displayed.

Select Mask

■ Summary

Selects selection method for the Mask line

■ Selection options

Standard Sets 3GPP standard mask line
User Sets user set mask line

Mask Setup

■ Summary

Sets the mask.
Open the window to set the mask, and then open the Mask Setup function menu.

■ Selection options

| | |
|---|---|
| Load Standard Setting | Reflects the standard mask settings to the user mask settings. |
| Mask Time | Selects the following items: Time 1, Time 2, Time3, Time 4, and Time 5 |
| Mask Level | Selects the following items: Level 1 and Level 2 |

Mask Setup: Load Standard Setting

■ Summary

Reflects the standard mask settings to the user mask settings.

Mask Setup: Mask Time (DL)

■ Summary

Selects the following items: Time 1, Time 2, Time3, Time 4, and Time 5

■ Setting range

Time1,2,4,5 0 to 100 chip

Time3 0 to 200 chip

Mask Setup: Mask Level (DL)

■ Summary

Selects the following items: Level 1 and Level 2

■ Setting range

–110 to –20

Trace: Smoothing (On/Off)

■ Summary

Sets smoothing On or Off

■ Selection options

On Enables settings for smoothing

Off Disables settings for smoothing

Trace: Smoothing Length

■ Summary

Sets smoothing length.

■ Setting range

0.2 to 10.0

Storage: Storage Mode (Off/Average)

■ Summary

Enables storage settings

- Selection options

| | |
|---|---|
| Off | Disables settings for storage |
| Average | Enables average storage settings |

Storage: Storage Count

- Summary

  Sets storage count

- Setting range

  2 to 999

### 3.5.3 Adjacent Channel Power Measurement (ACP)

This recalls the ACP function of the signal analyzer or spectrum analyzer functions. Settings for Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp are reflected automatically in the corresponding parameters. When this function is being recalled, Recall Current Application described in Section 3.6.2 Recalling parameters of the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Main Frame Operation)", "MS2830A Signal Analyzer Operation Manual (Main Frame Operation)" or "MS2850A Signal Analyzer Operation Manual (Main Frame Operation)" cannot be executed.



ACP (FFT)

■ Summary

Recalls ACP function of signal analyzer and measures adjacent channel power for reflected parameter settings

***Note***

At the signal analyzer, automatic settings for Trigger Switch, Trigger Source, Trigger Delay and Capture Length are applied based on parameters such as Target Time Slot and Trigger settings from the modulation analysis function. The user can change these settings when necessary.

ACP (Swept)

■ Summary

Recalls ACP function of spectrum analyzer and measures adjacent channel power for reflected parameter settings

***Note***

At the spectrum analyzer, automatic settings for Gate Sweep, Gate Source, Gate Delay and Gate Length are applied based on parameters such as Target Time Slot and Trigger settings from the modulation analysis function. The user can change these settings when necessary.

### 3.5.4 Occupied Bandwidth Measurement (OBW)

This recalls the OBW function of the signal analyzer or spectrum analyzer functions. Settings for Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp are reflected automatically in the corresponding parameters. When this function is recalled, Recall Current Application described in Section 3.6.2 Recalling parameters of the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Main Frame Operation)", "MS2830A Signal Analyzer Operation Manual (Main Frame Operation)" or "MS2850A Signal Analyzer Operation Manual (Main Frame Operation)" cannot be executed.

OBW (FFT)

- Summary

  Recalls OBW function of signal analyzer and measures occupied bandwidth for reflected parameter settings

***Note***

At the signal analyzer, automatic settings for Trigger Switch, Trigger Source, Trigger Delay and Capture Length are applied based on the parameters such as Target Time Slot and Trigger settings from the modulation analysis function. The user can change these settings when necessary.

OBW (Swept)

- Summary

  Recalls OBW function of spectrum analyzer and measures occupied bandwidth for reflected parameter settings

***Note***

At the spectrum analyzer, automatic settings for Gate Sweep, Gate Source, Gate Delay and Gate Length are applied based on parameters such as Target Time Slot and Trigger settings from the modulation analysis function. The user can change these settings when necessary.

### 3.5.5 Spectrum Emission Mask (SEM)

This recalls the Spectrum Emission Mask function of the spectrum analyzer. Settings for Carrier Frequency, Input level, Offset, Offset Value and Pre-Amp are reflected automatically in the corresponding parameters. When this function is recalled, Recall Current Application described in Section 3.6.2 Recalling parameters of the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Main Frame Operation)", "MS2830A Signal Analyzer Operation Manual (Main Frame Operation)" or "MS2850A Signal Analyzer Operation Manual (Main Frame Operation)" cannot be executed.

Spectrum Emission Mask (Swept)

- Summary

  Recalls SEM function of spectrum analyzer and measures spectrum emission mask for reflected parameter settings

***Note***

At the spectrum analyzer settings, standard parameters are applied automatically. There are different standard parameters for uplink and downlink. The user can change these settings when necessary.

# 3.6 Setting Marker

After selecting "Modulation Analysis" or "Power vs Time", pressing F5 (Marker) on the main function menu or Marker displays the corresponding Marker function menu.

## 3.6.1 Modulation Analysis

After selecting "Modulation Analysis", pressing F5 (Marker) on the main function menu or Marker displays the Marker function menu for "Modulation Analysis".

Marker

■ Summary
Sets marker function on/off

■ Selection options

On Enables marker function

Off Disables marker function

Constellation Select

■ Summary

Sets operation target for rotary knob and cursor key to Constellation

Bottom Graph Select

■ Summary

Sets operation target for rotary knob and cursor key to Graph Window

Constellation Marker Number

■ Summary

Sets target of marker (Chip) while Constellation results are displayed

■ Setting range

0 to 847

Bottom Graph Marker Number

■ Summary

Sets marker target while Bottom Graph results displayed

■ Setting range

0 to 15 for Code Domain Power vs Code Number and Code Domain Error vs Code Number

## 3.6.2 Power vs Time

After selecting "Power vs Time", pressing F5 (Marker) on the main function menu or Marker displays the Marker function menu for "Power vs Time".

Top Graph Marker

■ Summary

This sets the Marker value (Chip) for Top Graph

■ Selection range

0 to 6399

***Note***

When pressing a right or left key, Marker is moved to the Time Slot boundary.

Bottom Graph Marker

■ Summary

This sets the Marker value (Chip) for Bottom Graph.

■ Selection range

Top Graph Marker Value – 300.0 to Top Graph Marker Value + 299.9
Unit: Chip

Top Graph Marker to Transient

■ Summary

This moves the marker displayed at Top Graph to the signal transient (on/Off boundary) determined by the Uplink-downlink Configuration, and Special Subframe Configuration settings.

Top Graph Marker to Fail

■ Summary

This moves the marker displayed at Top Graph to the fail part.

Peak Search (margin)

■ Summary

This moves the marker to the peak point of the Margin result calculated using the measurements and Mask setting for the Off section specified at Mask Setup.

Margin = Measured value (dBm/MHz) – Mask setting (dBm/MHz)

Next Peak

■ Summary

This moves the marker to the point with the next largest margin relative to Margin of the current marker point in the measurement range.

# 3.7 Setting Trigger

Pressing F6 (Trigger) on the main function menu or Trigger/Gate displays the Trigger function menu.

### Trigger Switch

■ Summary

Sets trigger synchronization on/off

■ Selection options

| | |
|---|---|
| On | Enables trigger function |
| Off | Disables trigger function |

### Trigger Source

■ Summary

Sets trigger source

■ Selection options

| | |
|---|---|
| External*1 | Starts measurement using external trigger input |
| External 2*2 | Starts measurement using external trigger 2 input |
| SG Marker | Starts measurement using internal Vector Signal Generator timing |

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

### Trigger Slope

■ Summary

Sets trigger polarity

■ Selection options

| | |
|---|---|
| Rise | Synchronizes with trigger rising edge |
| Fall | Synchronizes with trigger falling edge |

### Trigger Delay

■ Summary

Sets trigger delay

■ Setting range

–0.5 to +0.5 s

# 3.8 EVM Display

This displays EVM analysis results for Target Time Slot of target carrier. It updates and displays the analysis results at each sweep for Off mode, the average of analysis results for the storage count for Average mode, and the average and maximum value of analysis results for Average & Max Storage Mode setting.



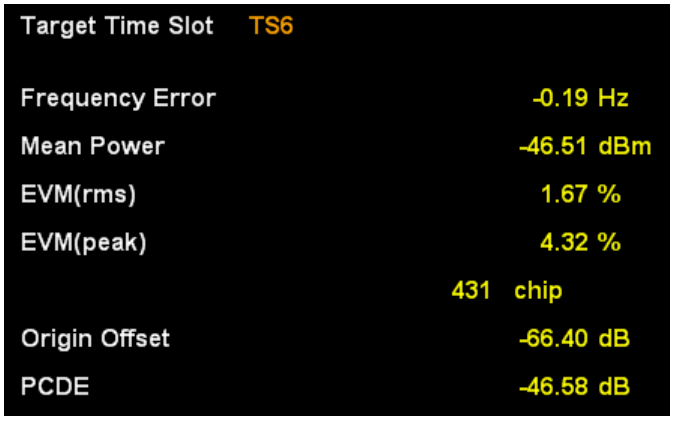



**Fig. 3.8-1 Result Window**

1. Target Time Slot

   Displays current Target Time Slot number set in Target Time Slot

   ☞ 3.4 Setting Common Items

2. Frequency Error

   Displays frequency error in Target Time Slot of target carrier

3. Mean Power

   Displays average RF level of Target Time Slot of target carrier

4. EVM (rms)

   Displays average EVM of all chips in Target Time Slot of target carrier

5. EVM (peak)

Displays maximum EVM of all chips in Target Time Slot of target carrier

6. chip

Displays chip number where EVM (peak) occurred

7. Origin Offset

Displays origin offset in Target Time Slot of target carrier

8. PCDE

Displays Peak Code Domain Error in Target Time Slot of target carrier

# 3.9 Constellation Display

This displays the Constellation for chips in Target Time Slot of target carrier. The marker at the selected chip is displayed in red.

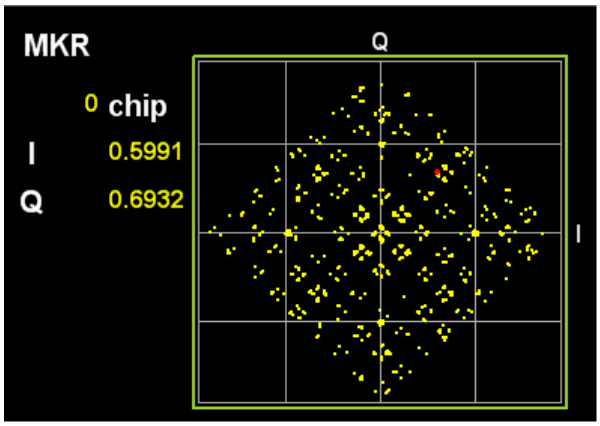



**Fig. 3.9-1 Constellation Display**

1. MKR chip

Displays number of chip selected by marker

The marker can be moved using the cursor keys or rotary knob.

2. MKR I/Q

Displays amplitude of I/Q of chip selected by marker

The marker can be moved using the cursor keys or rotary knob.

# 3.10 Code Domain Power vs Code Number Display

This displays the Code Domain Power measurement results for Target Slot of target carrier. The marker is displayed in red at the selected channel.

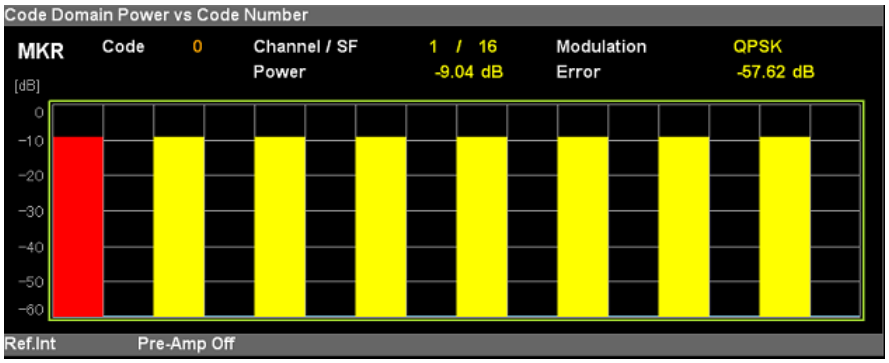



**Fig. 3.10-1 Code Domain Power vs Code Number Display**

1. MKR Channel/SF

   Displays the marker-selected Channel number and its Spreading factor.

   The marker can be moved using the cursor keys or rotary knob.

2. MKR Power

   Displays Code Domain Power for Code Number selected by marker

3. MKR Error

   Displays Code Domain Error for Code Number selected by marker

4. MKR Modulation

   Displays Modulation Scheme for Code Number selected by marker.

# 3.11 Code Domain Error vs Code Number Display

This displays the Code Domain Error measurement results for Target Slot of target carrier. The marker is displayed in red at the selected channel.

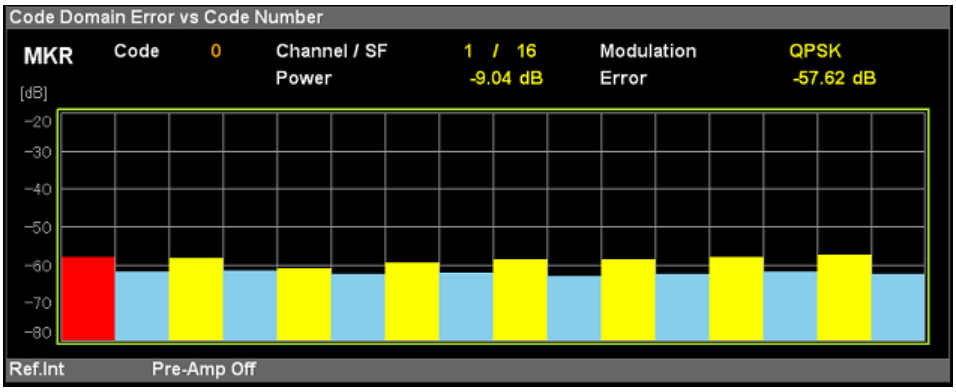



**Fig. 3.11-1 Code Domain Error vs Code Number Display**

1. MKR Channel/SF

Displays the marker-selected Channel number and its Spreading factor. The marker can be moved using the cursor keys or rotary knob.

2. MKR Power

Displays Code Domain Power for Code Number selected by marker

3. MKR Error

Displays Code Domain Error for Code Number selected by marker

4. MKR Modulation

Displays Modulation Scheme for Code Number selected by marker.

# 3.12 Multi Slot Power Display

This displays the Subframe Power, Mean, Data1, Midamble and Data2 Powers vs Slot number, including Downlink Pilot Time Slot (DwPTS) and Uplink Pilot Time Slot (UpPTS), in table form. Target Slot of target carrier is highlighted.

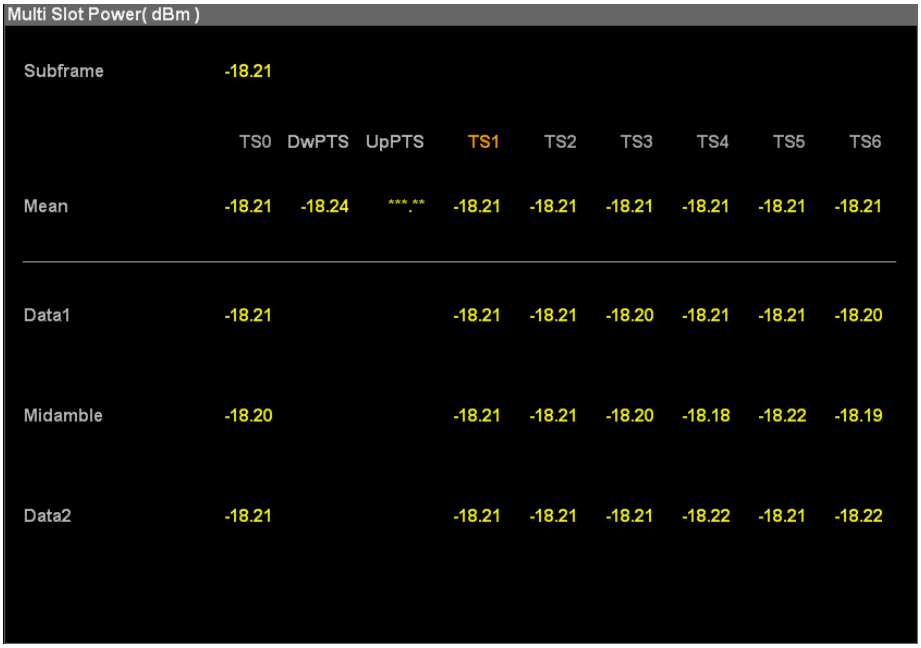



**Fig. 3.12-1 Multi Slot Power Display**

1. Multi Slot Power Result: Subframe

   Displays average power for Subframe of target carrier

2. Multi Slot Power Result: Mean

   Displays mean power for each slot, including Downlink Pilot Time Slot (DwPTS) and Uplink Pilot Time Slot (UpPTS) of target carrier

3. Multi Slot Power Result: Data1

   Displays average power for Data part (352 chips) before Midamble for each slot of target carrier

4. Multi Slot Power Result: Midamble

   Displays average power for Midamble (144 chips) for each slot of target carrier

5. Multi Slot Power Result: Data2

   Displays average power for Data part (352 chips) after Midamble for each slot of Target carrier

# 3.13 Multi Carrier Power Display

This displays the average power for each slot, including Downlink Pilot Time Slot (DwPTS) and Uplink Pilot Time Slot (UpPTS), of all carriers in table form. The Target Slot and target carrier set are highlighted.

Multi Carrier Power( dBm )

| | TS0 | DwPTS | UpPTS | TS1 | TS2 | TS3 | TS4 | TS5 | TS6 |
|---|---|---|---|---|---|---|---|---|---|
| Carrier 1 | -18.21 | -18.23 | ***.** | -18.21 | -18.21 | -18.20 | -18.20 | -18.21 | -18.20 |
| Carrier 2 | -18.20 | -18.23 | ***.** | -18.20 | -18.20 | -18.20 | -18.20 | -18.20 | -18.20 |
| Carrier 3 | -18.19 | -18.22 | ***.** | -18.20 | -18.19 | -18.19 | -18.19 | -18.19 | -18.19 |
| Carrier 4 | -18.20 | -18.23 | ***.** | -18.20 | -18.20 | -18.20 | -18.20 | -18.20 | -18.20 |
| Carrier 5 | -18.22 | -18.24 | ***.** | -18.22 | -18.21 | -18.21 | -18.21 | -18.22 | -18.21 |
| Carrier 6 | -18.22 | -18.25 | ***.** | -18.23 | -18.22 | -18.22 | -18.22 | -18.23 | -18.22 |

**Fig. 3.13-1 Multi Carrier Power Display**

1. Multi Carrier Power Result: Carrier

Displays mean power for each slot, including Downlink Pilot Time Slot (DwPTS) and Uplink Pilot Time Slot (UpPTS), of carrier

# 3.14 Power vs Time Display

This displays the measurement result graphs divided between the top and button graph.

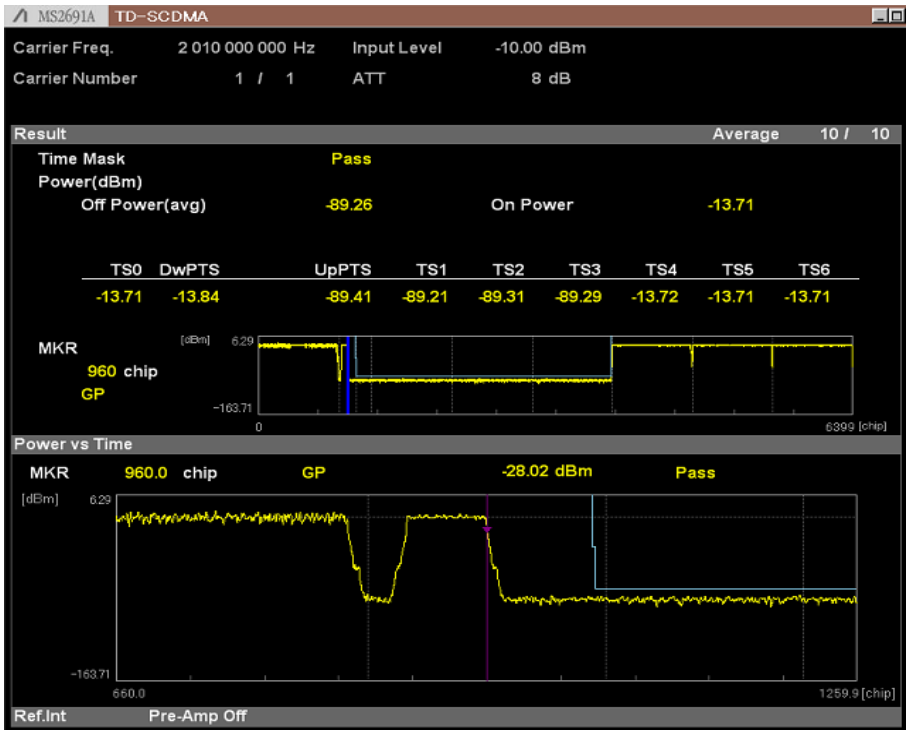



**Fig. 3.14-1 Power vs Time Display**

1. Time Mask

Displays the Time Mask judgment results.

2. Off Power

Displays the Off interval averaging power specified by the mask line.

3. On Power

Displays the On interval averaging power.

4. TSi Power

Displays the power values for each Time slot.

5. Top Graph (Result)

Displays total image for subframe

6. Bottom Graph (Power vs Time)

Displays graph near chip specified using Top Graph Marker

# Chapter 4 Performance Test

This chapter describes measurement equipment, setup methods, and test procedures required for preventive maintenance of the MS269x Series, MS2830A, or MS2850A.


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 part of preventive maintenance to prevent the MS269x Series, MS2830A or MS2850A performance becoming degraded.

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

- Carrier frequency accuracy
- Residual EVM

Perform critical items as preventive maintenance at regular intervals. The recommended cycle is once or twice a year.

If out-of-specification items are found, contact the Anritsu Service and Sales Office listed on the last page of the printed version of this manual, and in a separate file on the CD version.

# 4.2 Performance Test Items

Except when directed otherwise, warm-up the test equipment and measuring instruments for at least 30 minutes to stabilize them. In addition, achieving maximum measurement accuracy requires testing at a stable ambient temperature with minimum AC power-supply voltage fluctuations in a noise-, vibration-, and dust-free environment with low humidity.

## 4.2.1 Testing methods

(1) Test target standards

- Carrier frequency accuracy
- Residual EVM

(2) Measuring instruments

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

(3) Setup

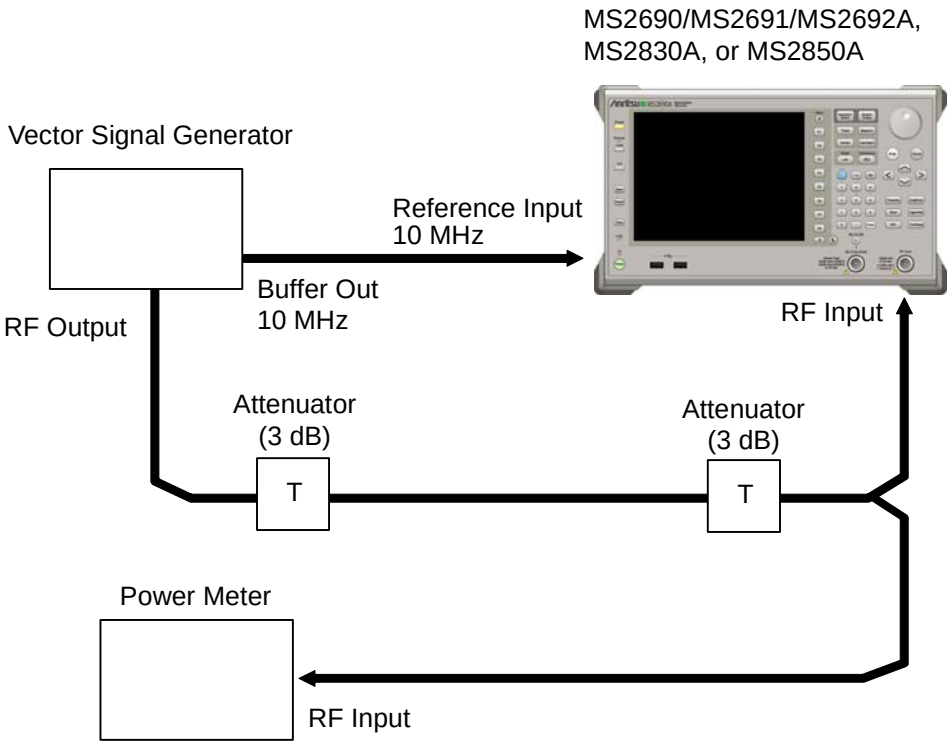



**Fig. 4.2.1-1 Performance Test**

(4) Test procedure

(a) Adjusting signal source

1. Input the 10-MHz reference signal output from the vector signal generator to the Reference Input connector of the MS269x Series, MS2830A or MS2850A.
2. Input the 10 MHz reference signal output from the signal generator to the Reference Input connector.
3. Output a TD-SCDMA modulation signal from the vector signal generator.
4. Input the vector signal generator output signal to the power meter and measure the power.

(b) Setting MS269x Series, MS2830A or MS2850A

1. Turn on the Power switch on the front panel of the MS269x Series, MS2830A or MS2850A and wait until the internal temperature stabilizes (about 1.5 hours after the temperature chamber stabilizes).
2. Press [Application Switch] and press the menu function key displaying the TD-SCDMA character string.
3. Press [Preset].
4. Press [F1] (Preset) to initialize.
5. Press [Cal].
6. Press [F1] (SIGANA All) to calibrate.
7. Press [F8] (Close).
8. Press [Frequency] and input the frequency output by the vector signal generator using the numeric keypad; press [Enter].
9. Press [Amplitude] and input the result of the power meter measurement using the numeric keypad; press [Enter].
10. Press [Trace] and then press [F4] (Storage) and [F1] (Mode) to choose Average using the cursor keys or rotary knob; press [Enter].
11. Press [F2] (Count) and input the measurement count using the numeric keypad; press [Enter].

12. 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).

13. Confirm that the measured frequency(Carrier frequency accuracy) error is within the specifications.
14. Confirm that the measured EVM (rms) (Residual EVM) is within the specifications.

(5) Test results

**Table 4.2.1-1 Carrier frequency measurement accuracy**

| Frequency | Min. limit | Deviation (Hz) | Max. limit | Uncertainty | Pass/Fail |
|---|---|---|---|---|---|
| 1850 MHz | MS269xA –20 Hz | | MS269xA +20 Hz | MS269xA ±2 Hz | |
| 2010 MHz | MS2830A –20 Hz | | MS2830A +20 Hz | MS2830A ±1.8 Hz | |
| 2300 MHz | MS2850A –20 Hz | | MS2850A +20 Hz | MS2850A ±1.8 Hz | |
| 2570 MHz | | | | | |

**Table 4.2.1-2 Residual EVM**

| Frequency | Measured value [% (rms)] | Max. limit | Uncertainty | Pass/Fail |
|---|---|---|---|---|
| 1850 MHz | | MS269xA 1.0% (rms) | MS269xA 0.15% (rms) | |
| 2010 MHz | | MS2830A 1.2% (rms) | MS2830A 0.1% (rms) | |
| 2300 MHz | | MS2850A 1.2% (rms) | MS2850A 0.1% (rms) | |
| 2570 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 Error Messages

**Table A-1 Error Messages**

| Message | Description |
|---|---|
| Out of range | The settable range is exceeded. |
| Not available in Center Frequency Mode | Carrier Frequency mode is not available when Center Frequency mode is set and vice versa. |
| Not available in Carrier Frequency Mode | Center Frequency mode is not available when Carrier Frequency mode is set and vice versa. |
| Not available in Auto Rate Detection On | Spreading Factor is not available when Auto Rate Detection is On. |
| Not available if not Code Domain | Target Time Slot cannot be set to Burst when Trace Mode is set to either Multi Slot Power or Multi Carrier Power. |
| Not available if not Code Domain Power | Code Domain Power Scale can not be set when Trace Mode is not set to Code Domain Power. |
| Not available if not Code Domain Error | Code Domain Error Scale can not be set when Trace Mode is not set to Code Domain Error. |
| Not available in Multi Slot Power | Marker Select and Marker Number are not available when Trace Mode is set to Multi Slot Power. |
| Not available in Multi Carrier Power | Marker Select and Marker Number are not available when Trace Mode is set to Multi Carrier Power. |
| Not available in Burst | Trace Mode cannot be set to Multi Slot Power when Target Time Slot is set to Burst. |
| Not available in Burst | Trace Mode cannot be set to Multi Carrier Power when Target Time Slot is set to Burst. |
| Not available in Bottom Graph Select | Constellation Marker Number is not available when Bottom Graph Select is set. |
| Not available in Constellation Select | Bottom Graph Marker Number is not available when Constellation Select is set. |
| Not available in Power vs Time. | Signal Detection cannot be set to UL at Power vs Time. Also, Target Time Slot cannot be set at Power vs Time. |
| Not available when Signal Detection is set to UL. | Signal Detection cannot be set to UL at Power vs Time. |
| Not available when Wide Dynamic Range is set to On. | Pre-Amp cannot be set to On, when Wide Dynamic Range is set to On. |
| Not available when Wide Dynamic Range is set to Off. | Noise Correction cannot be set to On when Dynamic Range is set to Off. |
| Not available when Pre-Amp Mode is set to On. | Noise Correction cannot be set to On, when Noise Correction is set to On. |
| Not available when either Wide Dynamic Range is set to Off, or Trigger Switch is set to Off. | Pre-Amp Mode cannot be set to On when either Dynamic Range is set to Off, or Trigger Switch is set to Off. |

**Table A-1 Error Messages (Cont'd)**

| Message | Description |
|---|---|
| Not available when Noise Correction is set to On. | Pre-Amp Mode cannot be set to On, when Noise Correction is set to On. |
| Please Load Signal Analyzer | The Signal Analyzer function is required to be loaded. |
| Please Load Spectrum Analyzer | The Spectrum Analyzer function is required to 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 | – |

| | |
|---|---|
| Frequency | |
| Carrier Frequency | 2.01 GHz |
| Center Frequency | 2.01 GHz |
| Frequency Mode | Carrier Frequency |
| | |
| Amplitude | |
| Input Level | –10.00 dBm |
| Pre-Amp | Off |
| Offset | Off |
| Offset Value | 0.00 dB |
| | |
| Common Setting | |
| Signal direction | Downlink |
| Scrambling Code Number | 0 |
| K | 16 |
| Target Time Slot | Burst |
| Carrier Number | 1 |
| Target Carrier | 1 |
| Active Channel Threshold | –30.00 dB |
| Active Slot Threshold | –10.00 dB |
| Auto Rate Detection | On |
| SF | 16 |
| | |
| Modulation Analysis | |
| Trace Mode | |
| | Code Domain Power |
| Storage | |
| Mode | Off |
| Count | 10 |
| Scale | |
| Code Domain Power Scale | 60.00 dB |
| Code Domain Error Scale | 60.00 dB |
| Marker | |
| Marker | On |
| Constellation Marker Number | 0 |
| Bottom Graph Marker Number | 0 |
| | |
| Power vs Time | |
| | |
| Power vs Time | |
| Wide Dynamic Range | On |
| Noise Correction | Off |
| Pre-Amp Mode | Off |
| Select Mask | Standard |

| | | | |
|---|---|---|---|
| | | Mask Setup | |
| | | Time1 | 8.0 chip |
| | | Time2 | 8.0 chip |
| | | Time3 | 85.0 chip |
| | | Time4 | 8.0 chip |
| | | Time5 | 8.0 chip |
| | | Level1 | –41.3dBm |
| | | Level2 | –80.00dBm |
| | Smoothing | | |
| | | Smoothing | On |
| | | Smoothing Length | 1.0 chip |
| | Storage | | |
| | | Mode | On |
| | | Storage Count | 10 |
| | Marker | | |
| | | Marker | On |
| | | Top Graph Marker Number | 0 chip |
| | | Bottom Graph Marker Number | 0.0 chip |
| Trigger | | | |
| | Trigger Switch | | Off |
| | Trigger Source | | External |
| | Trigger Slope | | Rise |
| | Trigger Delay | | 0 s |
| Accessory | | | |
| | Title | | TD-SCDMA |
| | Title | | On |

References are to section numbers.


## A

Accessory 3.1.2, 5.1
Active Channel Threshold 3.4
Active Slot Threshold 3.4
AC inlet 2.1.2
ACP 3.5.2
Amplitude 3.1.2, 3.3
Application key 2.1.1
Application Switch 2.3.2
Auto Rate Detection 3.4
AUX connector 2.1.2

## B

Bottom Graph Select 3.6
Bottom Graph Marker Number 3.6
Bottom Graph (Power vs Time) 3.14
Buffer Out connector 2.1.2

## C

Calibrating 2.4.2
Cal key 2.1.1
Cancel key 2.1.1
Carrier 3.13
Carrier Frequency 3.2
Carrier Number 3.4
Center Frequency 3.2
chip 3.8
Code Domain Error 3.11
Code Domain Power 3.10
Common Setting 3.4
Constellation 3.1.1, 3.9
Constellation Marker Number 3.6
Constellation Select 3.6
Continuous 3.1.3
Copy key 2.1.1
Count 3.5.1
Cursor key 2.1.1

## D

Data1 3.12
Data2 3.12
Downlink Pilot Time Slot 3.12, 3.13

## E

Enter key 2.1.1
Erase Warm Up Message 5.3
Ethernet 2.1.1
Ethernet connector 2.1.2
EVM (peak) 3.8
EVM (rms) 3.8
EVM Display 3.8

## F

Frequency 3.1.2, 3.2
Frequency Error 3.8
Frequency Mode 3.2
Function keys 2.1.1
Function menu 3.1.2

## G

GPIB 2.1.1
GPIB connector 2.1.2
Graph window 3.1.1

## H

Hard disk access lamp 2.1.1
HDD slot 2.1.2

## I

IF Out connector 2.1.2

## K

K 3.4

## L

Load Application Select 2.3.1
Local key 2.1.1

## M


Main function keys 2.1.1
Marker 3.1.2, 3.6
Mask Setup 3.5.2
Mean 3.12
Mean Power 3.8
Measure 3.1.2, 3.5
Measurement parameter 3.1.1
Midamble 3.12
MKR Channel/SF 3.10, 3.11
MKR Chip 3.9
MKR Error 3.10, 3.11
MKR I/Q 3.9
MKR Power 3.10, 3.11
MKR Modulation 3.10, 3.11
Modulation Analysis 3.5.1, 3.6.2
Modulation control key 2.1.1
Monitor Out connector 2.1.2
Multi Carrier Power 3.13
Multi Slot Power 3.12


## N


Noise Correction 3.5.2
Numeric keypad 2.1.1


## O


OBW 3.5.3
Offset 3.3
Offset Value 3.3
Origin Offset 3.8


## P


PCDE 3.8
Power Switch 2.1.1
Power vs Time 3.5.2, 3.6.2
Power vs Time Display 3.14
Pre-Amp 3.3
Pre-Amp Mode 3.5.2
Preset 2.4.1
Preset key 2.1.1


## R


Recall key 2.1.1
Ref Input connector 2.1.2
Reference frequency signal 2.1.2
Remote lamp 2.1.1
Result window 3.1.1, 3.8
RF input connector 2.1.1
RF output connector 2.1.1
RF output control key 2.1.1
Rotary knob 2.1.1


## S


Save key 2.1.1
SA Trigger Input connector 2.1.2
Scale 3.5.1
Scrambling Code Number 3.4
Select Mask 3.5.2
SG Trigger Input connector 2.1.2
Shift key 2.1.1
Signal Direction 3.4
Single 3.1.3
Spectrum Emission Mask 3.5.4
Spreading Factor 3.4
Status message 3.1.1
Storage 3.5.1
Subframe 3.12
Sweep Status Out connector 2.1.2


## T


Target Carrier 3.4
Target Time Slot 3.4
Title 5.2
Trace 3.5.2
Trace Mode 3.5.1, 3.5.1.1
Trigger 3.1.2, 3.7
Trigger Delay 3.7
Trigger Input connector 2.1.2
Trigger signal 2.1.2, 2.2
Trigger Slope 3.7
Trigger Source 3.7
Trigger Switch 3.7

## U

Uplink Pilot Time Slot 3.12, 3.13
USB 2.1.1, 2.1.2
USB connector
(type A) 2.1.1, 2.1.2
(type B) 2.1.2

## W

Wide Dynamic Range 3.5.2