# MX269015A TD-SCDMA 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 (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 this document before using the equipment.
- Keep this manual with the equipment.

## **ANRITSU CORPORATION**

Document No.: M-W3044AE-8.0

# Safety Symbols

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

## Symbols used in manual



## **↑** DANGER

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



## **⚠** WARNING

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



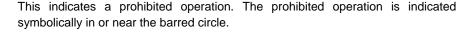
## **↑** CAUTION

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

## Safety Symbols Used on Equipment and in Manual

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



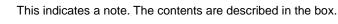




This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



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







These indicate that the marked part should be recycled.

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

7 February 2008 (First Edition) 28 April 2017 (Eighth Edition)

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

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## **CE** marking



#### 1. Product Model

Software: MX269015A TD-SCDMA Measurement Software

## 2. Applied Directive and Standards

When the MX269015A TD-SCDMA Measurement Software is installed in the MS2690/MS2691/MS2692A, MS2830A or MS2850A, the applied directive and standards of this unit conform to those of the MS2690/MS2691/MS2692A, MS2830A or MS2850A Main Frame.

## PS: About Main Frame

Please contact Anritsu for the latest information on the Main Frame types that the MX269015A can be used with.

# **RCM Conformity Marking**

Anritsu affixes the RCM mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

## **RCM** marking



## 1. Product Model

Software: MX269015A TD-SCDMA Measurement Software

## 2. Applied Directive and Standards

When the MX269015A TD-SCDMA Measurement Software is installed in the MS2690/MS2691/MS2692A, MS2830A or MS2850A, the applied directive and standards of this unit conform to those of the MS2690/MS2691/MS2692A, MS2830A or MS2850A Main Frame.

## PS: About Main Frame

Please contact Anritsu for the latest information on the Main Frame types that the MX269015A can be used with.

## **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.

MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Main Frame Operation)

MS2830A Signal Analyzer Operation Manual (Main Frame Operation)

MS2850A Signal Analyzer Operation Manual (Main Frame Operation)

MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Main Frame Remote Control)

MX269015A TD-SCDMA Measurement Software Operation Manual (Operation)

MX269015A TD-SCDMA Measurement Software Operation Manual (Remote Control)

- 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 kev.

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# Chapter 1 Overview

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

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## 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	- Openiousions
Target signals	Uplink and Downlink
Modulation/Frequency/Amplitude	
Measurement frequency ranges	1850 to 2620 MHz
Measurement level range	[Modulation/Frequency Measurement] MS269x Series/ MS2830A/ MS2850A -15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) -30 to +10 dBm (at Pre-Amp On)  [Amplitude Measurement] MS269x Series -15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) -30 to +10 dBm (at Pre-Amp On) MS2830A -15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) MS2850A -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 ± (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.  MS269x Series: ≤ 1.0% (rms)  MS2830A: ≤ 1.2% (rms)  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. $\pm 0.18 \ dB \ (Code \ Power \geq -10 dBc)$ $\pm 0.32 \ dB \ (Code \ Power \geq -30 dBc)$
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. $\pm 1.00$ dB (Code Error $\geq -40$ dBc)
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. ≤ −40 dB

Table 1.3-1 Specifications (Cont'd)

	A	
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.  MS269x Series  ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)  ±1.1 dB (at Pre-Amp On)  MS2830A  ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)  MS2850A  ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.)  Transmitter power accuracy is calculated from the RSS (root sum	
	square) error of the absolute amplitude accuracy and the in-band frequency characteristics.	
	Constellation	
Waveform displays	Code Domain Power vs Code Number	
	Code Domain Error vs Code Number	
Adjacent Channel Power Measu	urement	
Measurement method	Executes adjacent channel power measurement function of spectrum analyzer or signal analyzer	
Occupied Bandwidth Measuren	nent	
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	
	This function can be used only in MS269x series.	
	MS269x series	
Dynamic Range	≥ 126 dB (nominal)	
Dynamic Ivange	(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.

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## 2.1 Part Names

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

## 2.1.1 Front panel

This section describes the front-panel keys and connectors.

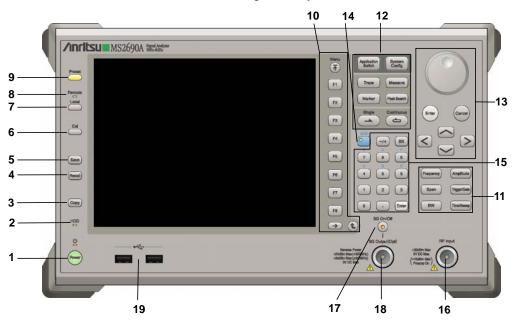


Figure 2.1.1-1 MS269x series front panel

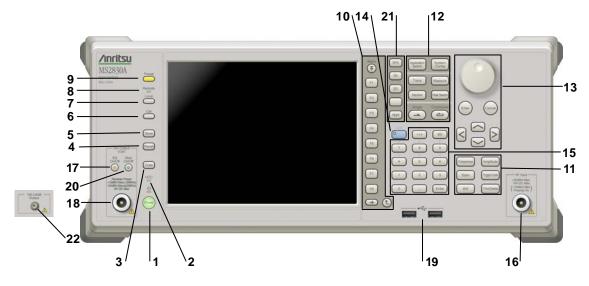


Figure 2.1.1-2 MS2830A/MS2850A front panel (MS2830A Example)

1 را



**Power Switch** 

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

2 HDD

Hard disk access lamp (MS269x series, MS2830A) Lights up when the internal hard disk is accessed.

SSD

SSD access lamp (MS2850A)

Lights up when the internal SSD is accessed.

3 Copy

Copy key

Press to capture display screen and save to file.

4 Recall

Recall key

Press to recall parameter file.

5 Save

Save key

Press to save parameter file.

6 Cal

Cal key

Press to display the Calibration menu.

#### Chapter 2 Preparation

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

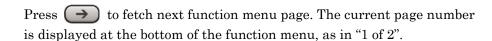
Preset key

Resets parameters to initial settings.

10



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



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















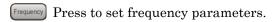




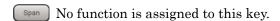
Main function keys 1

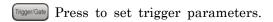
Press to set or execute main functions.

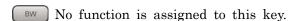
Executable functions vary with the current application. When nothing happens with the press, it indicates that the application in use does not support the key.

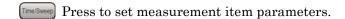












12



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 Press to switch application.

System Config Press to display Configuration screen.

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.

Press to start single measurement.

Press to start continuous measurements.

13



Enter Cancel



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 input or selected data.

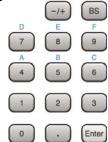
14



## 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 is green.

16 RF Input



RF Input connector

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

17 SG On/Off



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

Press 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

Outputs RF signal, when the Vector Signal Generator option is installed. This is an N type output connector.

This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A

## 19



#### USB connector (type A)

Connect the accessory USB keyboard, mouse or USB memory.

20



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

Press to switch on/off the modulation of RF signal when the Vector Signal Generator option is installed. The lamp on the key lights up in green in the modulation On state.

This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A.

21



Application key (MS2830A, MS2850A)

Press to switch between applications.

SPA

Press to display the Spectrum Analyzer main screen.

SA

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

SG

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.

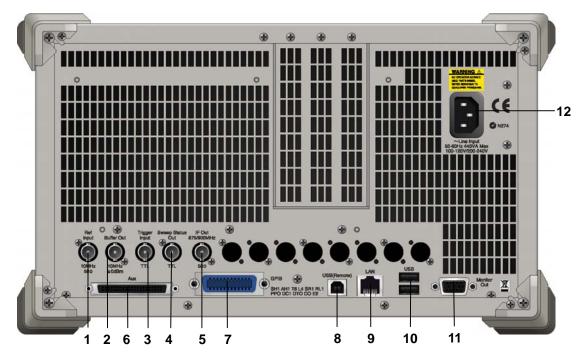


Figure 2.1.2-1 MS269x series rear panel

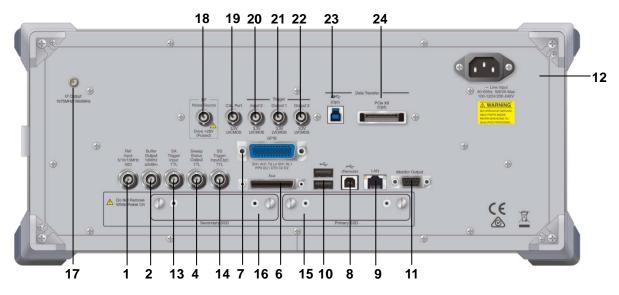


Figure 2.1.2-2 MS2830A/MS2850A rear panel (MS2850A Example)

1

Ref Input



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



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



Trigger Input connector (MS269x series only) Inputs trigger signal from external device.

4 Sweep Status



Sweep Status Out connector

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

5 IF Out 875/900MHz



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



#### 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.

- -





#### Monitor Out connector

Connects external display.

12



#### AC inlet

Supplies power.

13



SA Trigger Input connector (MS2830A, MS2850A)

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

14



SG Trigger Input connector (MS2830A)

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

**15 HDD** or

Primary HDD/SSD

HDD slot (MS2830A) SSD slot (MS2850A) This is a standard HDD slot. This is a standard SSD slot.

**16 HDD(Opt)** or

Secondary HDD/SSD

HDD slot for Option (MS2830A)

SSD slot (MS2850A)

This is a HDD slot for the options.

This is a SSD slot for the options.

17



IF output connector (MS2830A, MS2850A)

This is installed with the MS2830A-044/045 or on the MS2850A.

Monitor output of the internal IF signal.

18



Noise Source connector

Supply (+28 V) of the Noise Source Drive.

This is available when the Option 017/117 is installed.

19



CAL Port connector (Future extensions) (MS2850A)

20



Trigger Input 2 connector (MS2850A)

Input the trigger signal (3.3 V LVCMOS) for SPA and SA applications.

21



Trigger Output 1 connector (MS2850A)

Output the trigger signal (3.3 V LVCMOS).

22



Trigger Output 2 connector (MS2850A)

Output the trigger signal (3.3 V LVCMOS).

23



USB 3.0 connector (Future extensions) (MS2850A)

24 PCIe X8 connector (Future extensions) (MS2850A)



# 2.2 Signal Path Setup

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

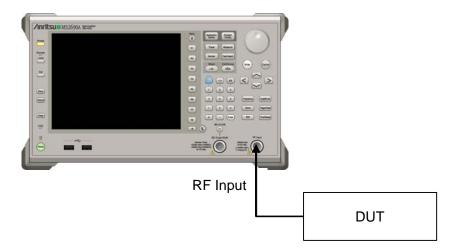


Figure 2.2-1 Signal path setup example

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

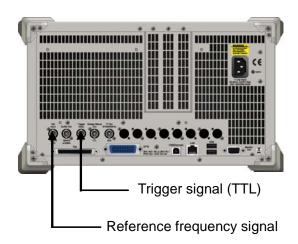


Figure 2.2-2 External signal input

# 2.3 Application Startup and Selection

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

## 2.3.1 Launching application

The application startup procedure is described below.

#### Note:

The XXX indicates the application name currently in use.

#### <Procedure>

- 1. Press System to display the Configuration screen.
- 2. Press [4] (Application Switch Settings) to display the Application Switch Registration screen.
- 3. Press [1] (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 (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 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>

- Press to display the Preset function menu.
- 2. Press (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>

- Press cal to display the Application Cal function menu.
- 2. Press [5] (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.

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# 3.1 Basic Operation

## 3.1.1 Screen layout

This section describes the MX269015A screen layout.

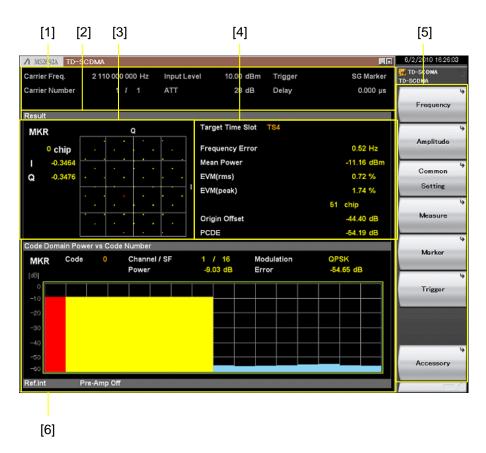


Fig. 3.1.1-1 Screen Layout

- [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 menuDisplays 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.

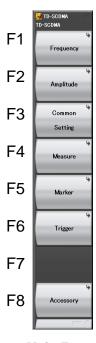


Fig. 3.1.2-1 Main Function Menu

Table 3.1.2-1 Main Function Menu

Menu Display	Function
Frequency	Sets frequency  3.2 Setting Frequency
Amplitude	Sets level 3.3 Setting Level
Common Setting	Sets common items  3.4 Setting Common Items
Measure	Sets measurement items  3.5 Setting Measurement Items
Marker	Sets marker  3.6 Setting Marker
Trigger	Sets trigger  3.7 Setting Trigger
Accessory	Sets other functions  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.

#### Single

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

## <Procedure>

1. Press .

#### Continuous

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 (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 (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

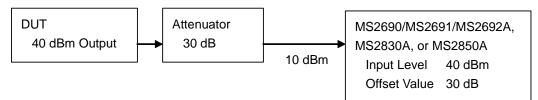


Fig. 3.3-1 Input Level and Offset Level Setting Example

## Auto Range

■ Summary

This function adjusts input level according to input signal.

# 3.4 Setting Common Items

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

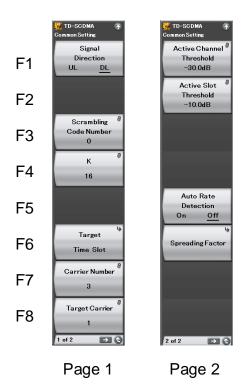


Fig. 3.4-1 Common Setting Function Menu

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

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

## 3.5.1 Modulation Analysis

Pressing (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

Code Domain Error Scale

Sets scale for Code Domain Error

Sets scale for Code Domain Error

## Scale: Code Domain Power Scale

■ Summary

Sets scale for Code Domain Power vs Code Number Display

Setting range

#### Scale: Code Domain Error Scale

### ■ Summary

Sets scale for Code Domain Error vs Code Number Display

## ■ Setting range

20 dB	$-80$ to $-60~\mathrm{dB}$
40 dB	$-80$ to $-40~\mathrm{dB}$
60 dB	$-80$ to $-20~\mathrm{dB}$
80 dB	-80 to 0 dB

## **3.5.1.1 Trace Mode**

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

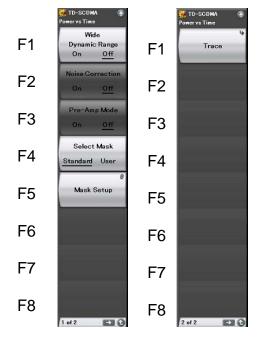


Fig. 3.5.2-1 Power vs Time Function Menu

Table 3.5.1-1 Modulation Analysis Function Menu

Menu Display	Function
Wide Dynamic Range	Sets wide dynamic range 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, Time 3, 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 (Marker) on the main function menu or Marker displays the corresponding Marker function menu.

## 3.6.1 Modulation Analysis

After selecting "Modulation Analysis", pressing (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 [5] (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.

#### **Setting Trigger** 3.7

Pressing (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.

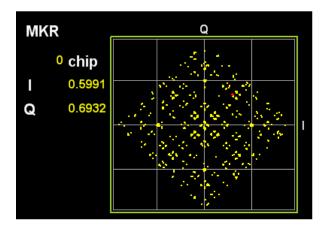


Fig. 3.9-1 Constellation Display

## 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.

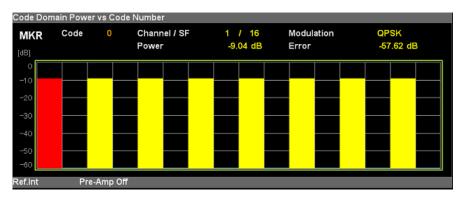


Fig. 3.10-1 Code Domain Power vs Code Number Display

#### 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.

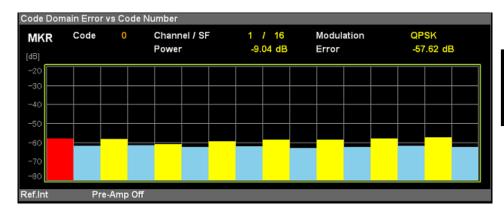


Fig. 3.11-1 Code Domain Error vs Code Number Display

#### 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.



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.

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4.2	Performance Test Items4	-3
	4.2.1 Testing methods4	<b>i-</b> 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.

MS2690/MS2691/MS2692A,

## 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

MS2830A, or MS2850A Vector Signal Generator Reference Input 10 MHz ---**Buffer Out RF** Input 10 MHz **RF** Output Attenuator Attenuator (3 dB) (3 dB) Т Т Power Meter **RF** Input

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 and press the menu function key displaying the TD-SCDMA character string.
- Press Preset
   Press (Preset) to initialize.
- 5. Press Cal
- 6. Press [5] (SIGANA All) to calibrate.
- 7. Press F8 (Close).
- 8. Press requery and input the frequency output by the vector signal generator using the numeric keypad; press research.
- 9. Press and input the result of the power meter measurement using the numeric keypad; press (Enter).
- 10. Press Trace and then press [4] (Storage) and [5] (Mode) to choose Average using the cursor keys or rotary knob; press [Enter].
- 11. Press [2] (Count) and input the measurement count using the numeric keypad; press [Enter].

- 12. Press to measure.
  - When measuring the carrier frequency accuracy, select **Auto** for **Reference Signal**. When measuring the residual vector error, select **Fixed to Internal**.
  - Press Stem Settings) after pressing to display the System Settings screen. Select and set Reference Signal with cursor key, and then press (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		MS2830A	MS2830A	
2300 MHz	-20 Hz		+20 Hz	±1.8 Hz	
2570 MHz	MS2850A -20 Hz		MS2850A +20 Hz	MS2850A ±1.8 Hz	

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	MS2830A	
2300 MHz		1.2% (rms)	0.1% (rms)	
2570 MHz		MS2850A 1.2% (rms)	MS2850A 0.1% (rms)	

### 5

# 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 [58] (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 [5] (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 [5] (Set).
- 3. Press [52] (Title) and then select "Off" to hide the title.

## 5.3 Erasing Warmup Message

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

#### <Procedure>

- 1. Press (Accessory) on the main function menu.
- 2. Press [4] (Erase Warm Up Message) to erase the warmup message.

# Appendix A Error Messages

#### Table A-1 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	_	

## Appendix B Initial Value List

Frequency

 $2.01~\mathrm{GHz}$ Carrier Frequency Center Frequency  $2.01~\mathrm{GHz}$ 

Frequency Mode Carrier Frequency

Amplitude

Input Level -10.00 dBm

Off Pre-Amp Offset Off Offset Value 0.00 dB

Common Setting

Downlink Signal direction

Scrambling Code Number 0 16 Target Time Slot Burst Carrier Number 1 Target Carrier

Active Channel Threshold -30.00 dBActive Slot Threshold  $-10.00~\mathrm{dB}$ 

Auto Rate Detection On SF16

**Modulation Analysis** 

Trace Mode

Code Domain Power

Storage

Mode Off Count 10

Scale

Code Domain Power Scale 60.00 dBCode 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 Off Noise Correction Pre-Amp Mode Off Select Mask Standard

I	
Time1	8.0 chip
Time2	8.0 chip
Time3	85.0 chip

 Time3
 85.0 chip

 Time4
 8.0 chip

 Time5
 8.0 chip

 Level1
 -41.3dBm

 Level2
 -80.00dBm

Smoothing

Mask Setup

Smoothing On Smoothing Length 1.0 chip

Storage

Mode On Storage Count 10

Marker

MarkerOnTop Graph Marker Number0 chipBottom Graph Marker Number0.0 chip

Trigger

Accessory

Title TD-SCDMA

Title On

References are to section n	iumbers.	D	
A		Data1	3.12
Accessory	3.1.2, 5.1	Data2	3.12 $3.12$
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Modulation control key	2.1.1	Select Mask	3.5.2	
Monitor Out connector	2.1.2	SG Trigger Input connecto	r 2.1.2	
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Multi Slot Power	3.12	Signal Direction	3.4	
		Single	3.1.3	
N		Spectrum Emission Mask	3.5.4	
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Numeric keypad	2.1.1	Status message	3.1.1	
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U

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 $USB\ connector$ 

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(type B) 2.1.2

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