MX269011A
W-CDMA/HSPA Downlink
Measurement Software
Operation Manual
Operation

12th 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 MS2690/MS2691/MS2692A, MS2830A, or MS2850A Signal Analyzer Operation Manual (Mainframe Operation). Please also refer to it before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3098AE-12.0

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

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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.

MX269011A
W-CDMA/HSPA Downlink Measurement Software
Operation Manual Operation

15 August 2008 (First Edition)
30 September 2020 (12th Edition)

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- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
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Revision History:

February 29th, 2020

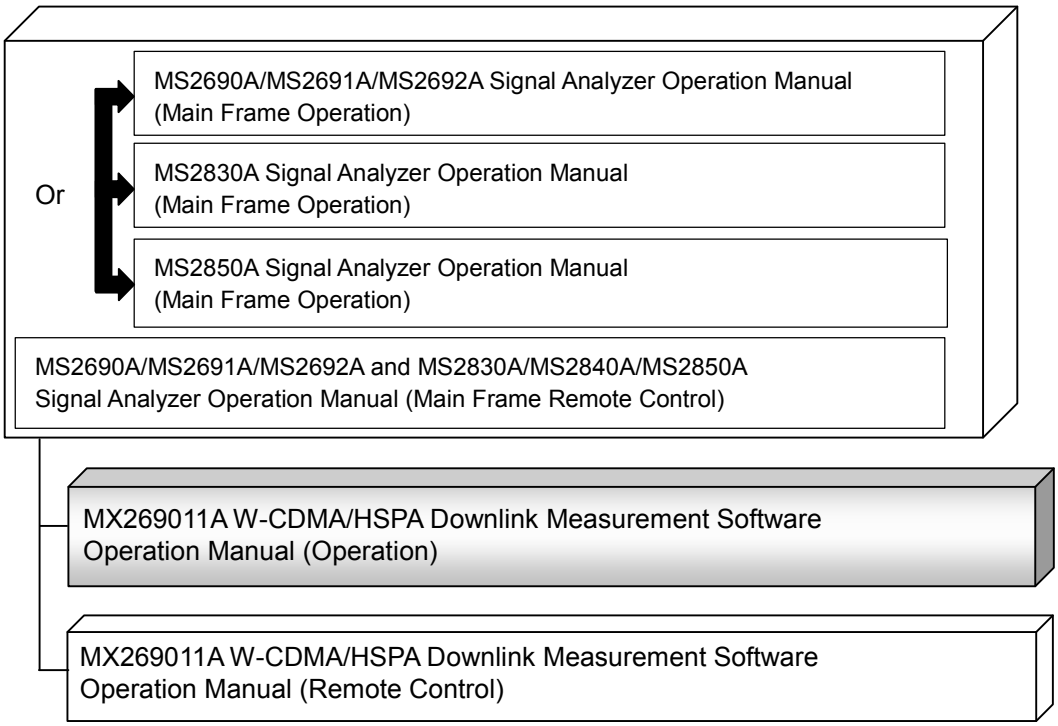
Cautions Against Computer Virus Infection

- 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

■ About this document

MX269011A W-CDMA/HSPA Downlink Measurement Software Operation Manual (Operation)



■ **Related manuals**

Each related manual describes the following operations.
Refer to each operation manual for details.

Signal Analyzer Operation Manual (Mainframe Operation)
Signal Analyzer Operation Manual (Mainframe Remote Control)
These describe basic operations, maintenance procedure, common functions and common remote functions of the signal analyzer.

W-CDMA/HSPA Downlink Measurement Software Operation Manual (Operation) [This document]

This document describes the operation of MX269011A W-CDMA/HSPA Downlink Measurement Software. As for signal analyzer hardware and its basic functions and operation outline, refer to "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation)", "MS2830A Signal Analyzer Operation Manual (Mainframe Operation)", or "MS2850A Signal Analyzer Operation Manual (Mainframe Operation)".

W-CDMA/HSPA Downlink Measurement Software Operation Manual (Remote Control)
This document describes the remote operation of MX269011A W-CDMA/HSPA Downlink Measurement Software. As for signal analyzer application's basic remote control functions and its definitions of common commands, refer to "MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Mainframe Remote Control)".

Convention Used in This Manual

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

■ **Document Conventions**

: This indicates the Signal Analyzer panel keys.

: This indicates pages and sections to be referred to.

Boldface : This indicates message that appears on the screen.

‘ ’ : This indicates reference that does not pertain to screen messages.

“ ” : This indicates reference, or jump to other section of the manual.

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Chapter 1 Outline

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1.2 Product Configuration 1-3
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1.1 Product Overview

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

The MX269011A W-CDMA/HSPA Downlink Measurement Software is a software option for measuring the RF characteristics of W-CDMA/HSPA (FDD) downlink specified by 3GPP.

The MX269011A supports the following measurements.

- Modulation accuracy
- Carrier frequency
- Transmitter power
- Code domain
- Code vs Time

MS2830A-006/106 is required to use the MX269011A on MS2830A.

1.2 Product Configuration

1.2.1 Standard Composition

Table 1.2.1-1 lists the standard configuration of the MX269011A.

Table 1.2.1-1 Standard Composition

Item	Model/Symbol	Name	Quantity	Remarks
Application	MX269011A	W-CDMA/HSPA Downlink Measurement Software	1	
Accessories	—	Installation CD-ROM	1	Application software, Operation manual CD-ROM

1.2.2 Application Parts

Table 1.2.2-1 lists the application parts for the MX269011A.

Table 1.2.2-1 Application Parts

Model/Symbol	Name	Remarks
W3098AE	MX269011A W-CDMA/HSPA Downlink Measurement Software Operation Manual (Operation)	English, Printed Version
W3099AE	MX269011A W-CDMA/HSPA Downlink Measurement Software Operation Manual (Remote Control)	English, Printed Version

1.3 Specifications

Table 1.3-1 lists the specifications for the MX269011A.

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

Attenuator Mode: Mechanical Atten Only

Table 1.3-1 Specifications

Item	Specification
Common Specifications	
Target Signal	W-CDMA/HSPA Downlink
Measurement Frequency Range	400 MHz to 3 GHz
Measurement Level Range	–15 to +30 dBm (at Pre-Amp Off, or Pre-Amp not installed.) –30 to +10 dBm (at Pre-Amp On)
Modulation/Frequency Measurement	
Carrier Frequency Measurement Accuracy	After CAL execution at 18 to 28ºC For a signal of EVM = 1% MS269x Series : ±(accuracy of reference crystal oscillator × carrier frequency + 5 Hz) MS2830A : ±(accuracy of reference crystal oscillator × carrier frequency + 6 Hz) MS2850A : ±(accuracy of reference crystal oscillator × carrier frequency + 6 Hz)
Residual EVM	After CAL execution at 18 to 28ºC The signal measured is within the measurement level range and less than or equal to Input Level. MS269x Series : ≤1.0% (rms) MS2830A : ≤1.3% (rms) MS2850A : ≤1.3% (rms)
Amplitude Measurement	
Transmitter Power Accuracy	After CAL execution at 18 to 28ºC, input attenuator ≥10 dB, The input signal is within the measurement level range and less than or equal to Input Level. MS269x Series ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) ±1.1 dB (at Pre-Amp On) MS2830A ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) MS2850A ±0.6 dB (at Pre-Amp Off, or Pre-Amp not installed.) Transmitter power accuracy is calculated from an RSS (root summed square) error of the absolute amplitude accuracy and the in-band frequency characteristics.

Table 1.3-1 Specifications (Continued)

Item	Specification
Code Domain Measurement	
Code Domain Power Relative Value Accuracy	After CAL execution at 18 to 28°C The input signal is within the measurement level range and less than or equal to Input Level. MS269x Series : ±0.02 dB (Code Power ≥–10 dBc) ±0.05 dB (Code Power ≥–20 dBc) ±0.10 dB (Code Power ≥–30 dBc) MS2830A : ±0.02 dB (Code Power ≥–10 dBc) ±0.10 dB (Code Power ≥–20 dBc) ±0.15 dB (Code Power ≥–30 dBc) MS2850A : ±0.02 dB (Code Power ≥–10 dBc) ±0.10 dB (Code Power ≥–20 dBc) ±0.15 dB (Code Power ≥–30 dBc)
Code Domain Error	After CAL execution at 18 to 28°C The input signal is within the measurement level range and less than or equal to Input Level. Residual Error MS269x Series : ≤–46 dB MS2830A : ≤–42 dB MS2850A : ≤–42 dB Accuracy ±0.3 dB (for code domain error of ≥–30 dBc) ±1.0 dB (for code domain error of ≥–40 dBc)
Waveform Display	EVM vs Symbol, Amplitude Error vs Symbol, Phase Error vs Symbol, Symbol Constellation, Code Domain Power, Code Domain Error
Adjacent Channel Leakage Power Measurement	
Measurement Method	Execution of the adjacent channel leakage power measurement function of the Spectrum Analyzer or Signal Analyzer
Occupied Bandwidth Measurement	
Measurement Method	Execution of the occupied bandwidth measurement function of the Spectrum Analyzer or Signal Analyzer
Channel Power Measurement	
Measurement Method	Execution of the channel power measurement function of the Spectrum Analyzer or Signal Analyzer
Spectrum Emission Mask Measurement	
Measurement Method	Execution of the spectrum emission mask measurement function of the Spectrum Analyzer

Chapter 2 Preparation

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

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2.1 Part Names

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

2.1.1 Front panel

This section describes the front-panel keys and connectors.

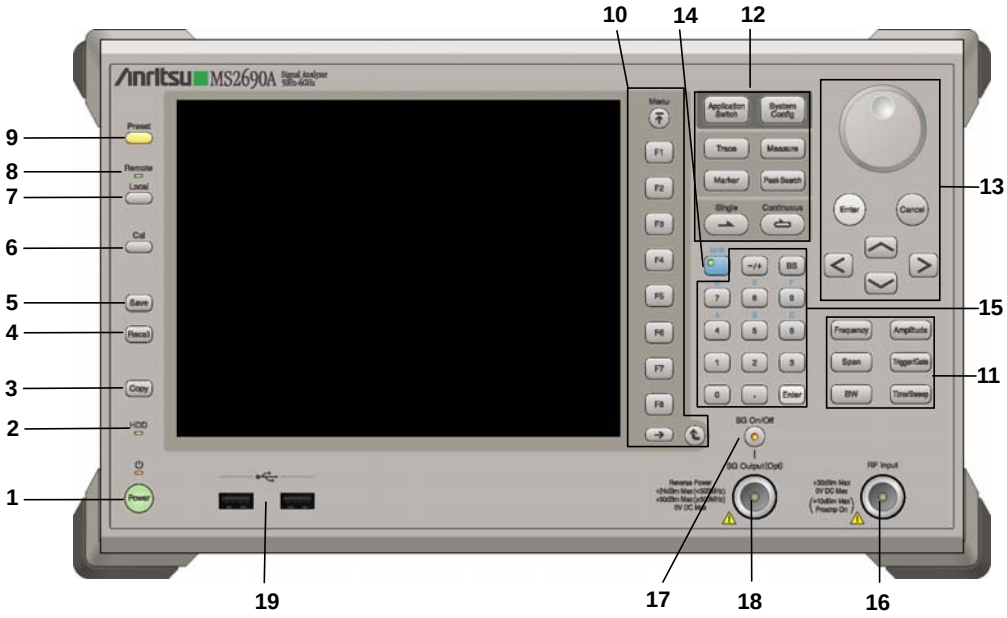


Figure 2.1.1-1 MS269x series front panel

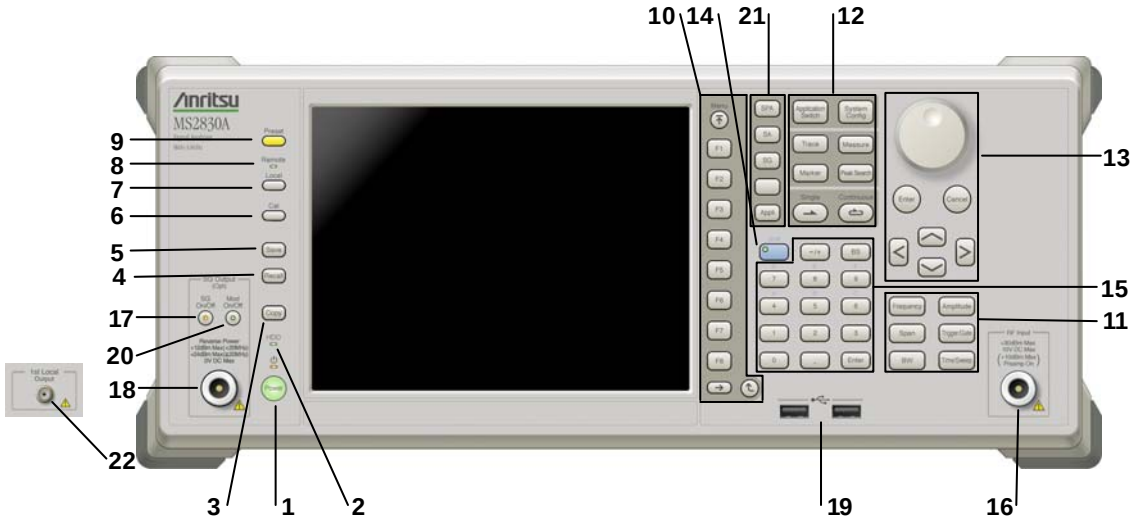


Figure 2.1.1-2 MS2830A/MS2850A front panel (MS2830A Example)

1

Power Switch

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

2

Hard disk access lamp (MS269x series, MS2830A)

Lights up when the internal hard disk is accessed.

SSD access lamp (MS2850A)

Lights up when the internal SSD is accessed .

3

Copy key

Press to capture display screen and save to file.

4

Recall key

Press to recall parameter file.

5

Save key

Press to save parameter file.

6

Cal key

Press to display the Calibration menu.

7

Local key

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

8

Remote lamp

Lights when in remote-control state.

9

Preset key

Resets parameters to initial settings.

10

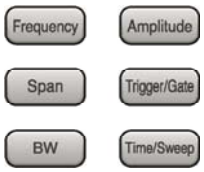
Function keys

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

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

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

11



Main function keys 1

Press to set or execute main functions.

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

Frequency Press to set frequency parameters.

Amplitude Press to set level parameters.

Span No function is assigned to this key.

Trigger/Gate Press to set trigger parameters.

BW No function is assigned to this key.

Time/Sweep Press to set measurement item parameters.

12

Main function keys 2

Press to set or execute main functions.

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

Application Switch Press to switch application.

System Config Press to display Configuration screen.

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

Measure Press to set measurement item parameters.

Marker Use when switching graph marker operation.

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

Single Press to start single measurement.

Continuous Press to start continuous measurements.

13

Rotary knob/Cursor key/Enter key/Cancel key

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

Press Enter to set the entered or selected data.

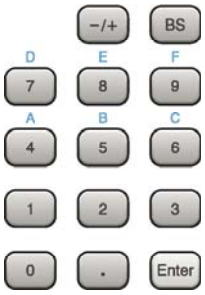
Press Cancel to cancel input or selected data.

14

Shift key

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

15



Numeric keypad

Enters numbers on parameter setup screens.

Press BS to delete the last entered digit or character.

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

16 RF Input

RF Input connector

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

17 SG On/Off

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

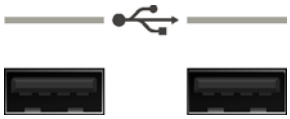
Press SG On/Off to switch on/off the modulation of RF signal when the Vector Signal Generator option is installed. The RF output control key lamp lights orange when the RF signal output is set to On.
This cannot be installed on the MS2830A with the MS2830A-044/045, or on the MS2850A.

18 SG Output(Opt)

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

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

19



USB connector (type A)

Connect the accessory USB keyboard, mouse or USB memory.

20

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

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

21

Application key (MS2830A, MS2850A)

Press to switch between applications.

Press to display the Spectrum Analyzer main screen.

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

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

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

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

22

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

2.1.2 Rear panel

This section describes the rear-panel connectors.

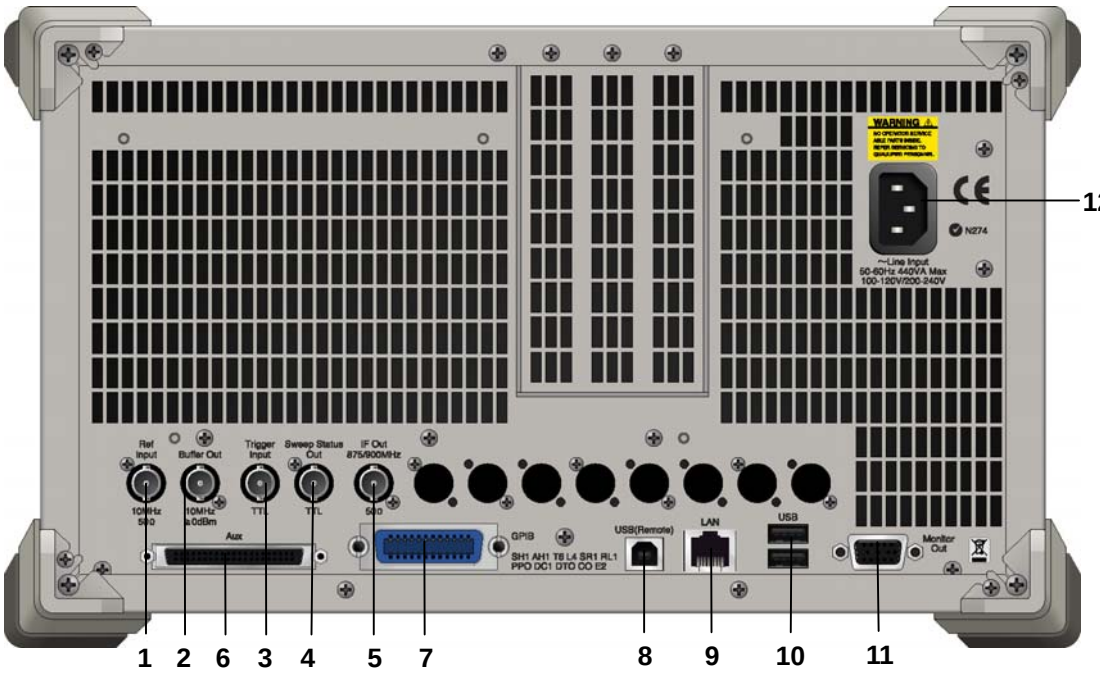


Figure 2.1.2-1 MS269x series rear panel

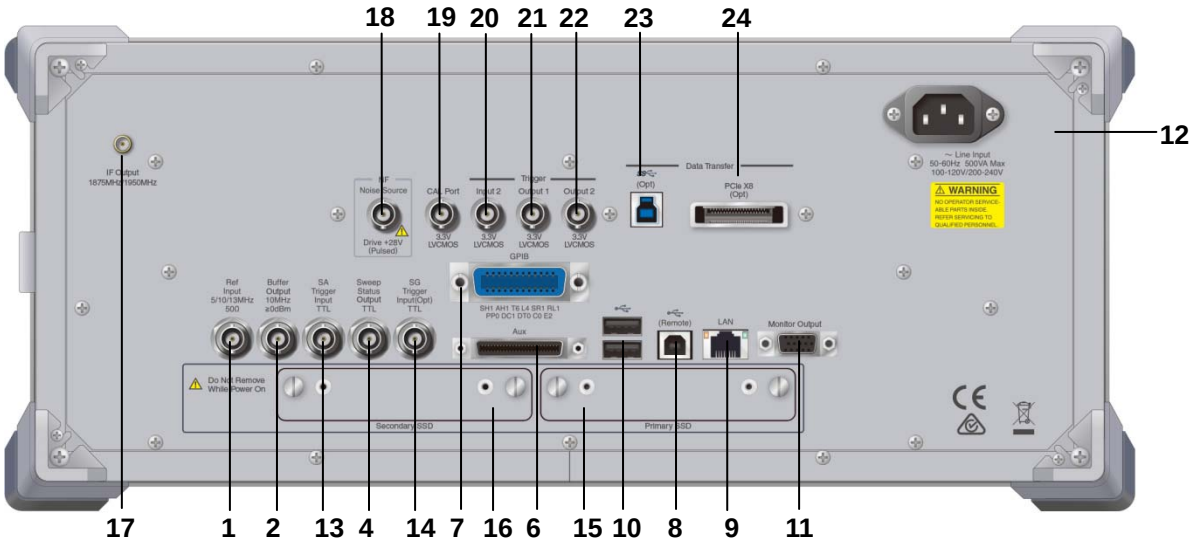


Figure 2.1.2-2 MS2830A/MS2850A rear panel (MS2850A Example)

1

Ref Input connector (reference frequency signal input connector)

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

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

2

Buffer Out connector (reference frequency signal output connector)

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

3

Trigger Input connector (MS269x series only)

Inputs trigger signal from external device.

4

Sweep Status Out connector

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

5

IF Out connector (MS269x series only)

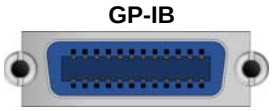
Not used.

6

AUX connector

Not used.

7



GPIB connector

For external control via GPIB.

8 USB(Remote)

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

9 LAN

Ethernet connector
Connects PC or Ethernet network.

10 USB

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

11 **Monitor Out**

Monitor Out connector
Connects external display.

12

AC inlet
Supplies power.

13

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

14

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

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

17

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

18

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

19

CAL Port connector (Future extensions) (MS2850A)

20

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

21

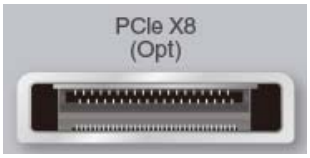
Trigger Output 1 connector (MS2850A)
Output the trigger signal (3.3 V LVCMOS).

22

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

23

USB 3.0 connector (Future extensions) (MS2850A)

24 

PCIe X8 connector (Future extensions) (MS2850A)

2.2 Signal Path Setup

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

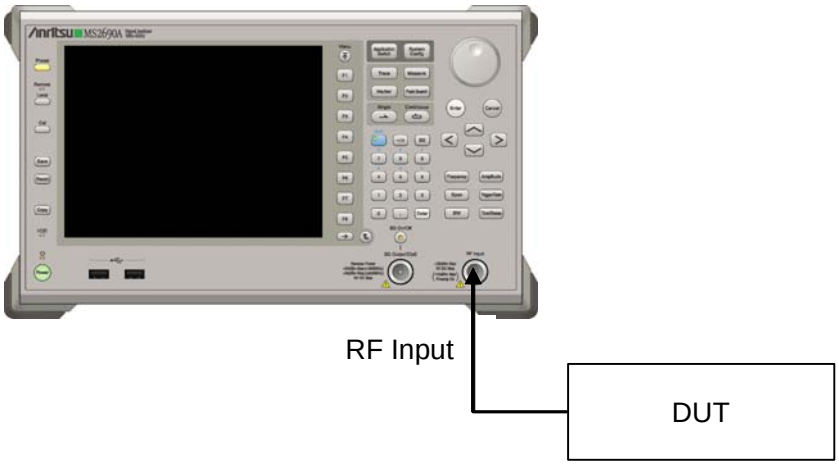


Figure 2.2-1 Signal path setup example

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

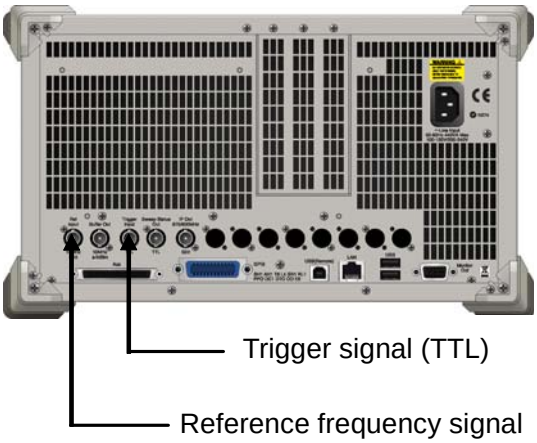


Figure 2.2-2 External signal input

2.3 Application Startup and Selection

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

2.3.1 Launching application

The application startup procedure is described below.

Note:

The XXX indicates the application name currently in use.

<Procedure>

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

2.3.2 Selecting application

The selection procedure is described below.

<Procedure>

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

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

2.4 Initialization and Calibration

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

2.4.1 Initialization

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

Note:

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

The initialization procedure is as follows.

<Procedure>

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

2.4.2 Calibration

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

<Procedure>

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

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

Chapter 3 Measurement

This chapter describes the measurement function, the parameter contents and the setting methods for the MX269011A.

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3.1 Basic Operation

3.1.1 Screen layout

This section describes the screen layout of the MX269011A.

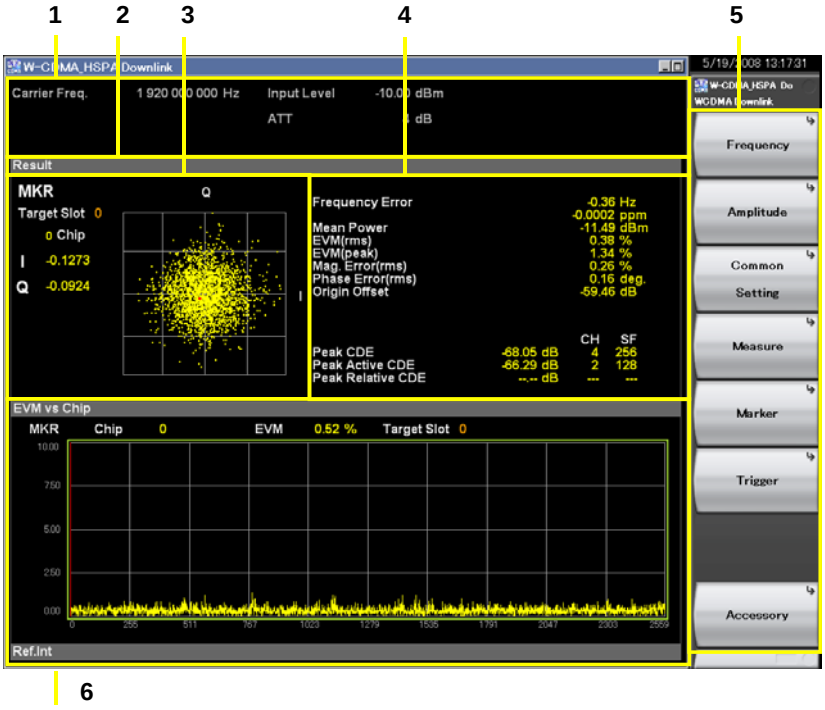

Figure 3.1.1-1 Screen layout (Modulation Analysis/Code Domain)

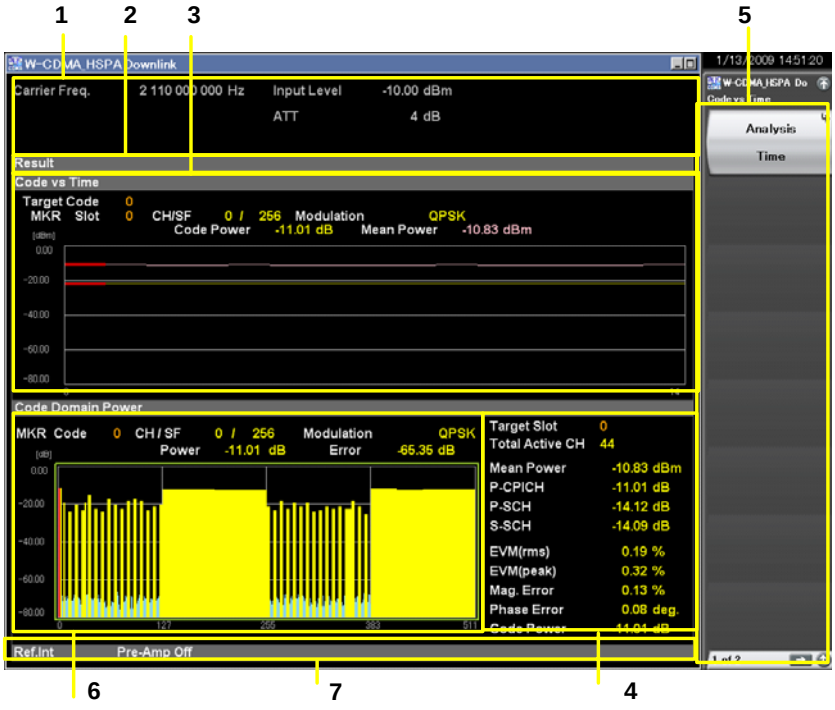

Figure 3.1.1-2 Screen layout (Code vs. Time)

1 Measurement parameters

Displays configured parameters.

Display Item		Description
Center Freq.		Carrier Frequency
Input Level		Input Level
ATT		Attenuator Value
Offset		Offset Value (Displays when Offset is set to On.)
Trigger	External	External input trigger is effective.
	External 2	External input trigger 2 is effective.
	SG Marker	Vector Signal Generator option trigger is effective.
	— (No display)	Freerun
Trigger Delay		Trigger Delay Value

2 Status message

Displays signal status.

Display Item	Description
Warm Up	Warming up
Measuring	Measurement in progress
Level Over	Input signal level is too high.
Signal Abnormal	Signal synchronization failed.

3 Upper Graph window

Displays a graph of measurement results.

4 Result window

Displays the numeric results.

5 Function menu

Displays the functions executable with function keys.

6 Bottom Graph window

Displays a graph of measurement results.

7 Status message

Displays current parameter setting.

Display Item	Description
Ref. Int / Ext / Unlock	Reference signal status
Pre-Amp On / Off	Pre-Amp status
Correction On	Sets the correction table to use in a segment. For details of a correction table, see "3.4.10 Correction" of "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Main unit Operation)", "MS2830A Signal Analyzer Operation Manual (Main unit Operation)", or "MS2850A Signal Analyzer Operation Manual (Main unit Operation)".

3.1.2 Performing measurement

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

■ Single Measurement

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

1. Press .

When a Single measurement is completed, this application completes all Downlink measurements and stops operation. When changing to another Downlink measurement screen in this condition, the results for this measurement are displayed.

■ Continuous Measurement

Updates the measurement results after each measurement.
Press to end continuous measurement.

Measurement will continue even if parameters are changed or the window display is changed. Measurement stops if other applications are selected.

1. Press .

3.2 Setting Frequency (Carrier Frequency)

Sets carrier frequency of target signal.
The frequency set in the measurement parameters is displayed.

■ Procedure

1. Open the **Carrier Frequency** dialog box.
   Open the dialog box as shown below.
   - Pressing **Frequency** > **Carrier Frequency** on the main function menu opens the Carrier Frequency dialog box.
   - Pressing Frequency on the front panel displays the Frequency function menu and opens the **Carrier Frequency** dialog box.
2. Enter the carrier frequency of measurement target.
3. Press either a unit button (**GHz**, **MHz**, **kHz**, **Hz**) for the input carrier frequency, or the **Set** button to set the input value.
4. When setting the carrier frequency, the carrier frequency input at the measurement parameters is displayed.

Figure 3.2-1 Carrier Frequency Setting Example

■ Setting options

30 MHz to the upper limit of the main unit

3.3 Setting Input Level (Amplitude)

Sets parameters related to input level of target signal.

⚠ CAUTION

Do not input signals with excessive power to the RF Input, because it does not have an over-power protection circuits. Input of out-of-specification signal power or impression of DC voltage risks damaging internal parts.

For details, refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual **(Main unit Operation)**", "MS2830A Signal Analyzer Operation Manual **(Main unit Operation)**", or "MS2850A Signal Analyzer Operation Manual **(Main unit Operation)**".

☞ **2.2.2 Input level and reverse power (when vector signal generator is installed) to RF Input**

3.3.1 Setting Input Level (Input Level)

Sets the input level of measurement target.

■ Procedure

1. Open the **Input Level** dialog box.
   Open the dialog box as shown below.
   - Pressing **Amplitude** > **Input Level** on the main function menu opens the **Input Level** dialog box.
   - Pressing Amplitude on the front panel displays the Amplitude function menu and opens the **Input Level** dialog box.
2. Input the input level of measurement target.
3. Press either the **dBm** unit button for the input signal, or the **Set** button to set the input value.
4. When setting the input level, the input level is displayed in the measurement parameters.

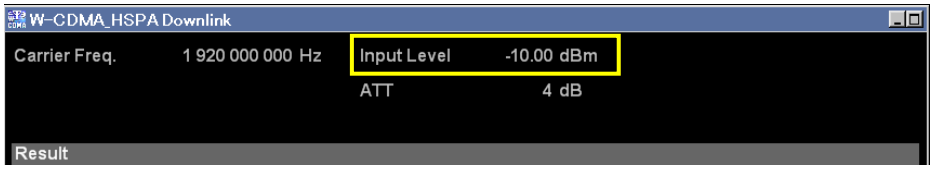

Figure 3.3.1-1 Input Level Setting Example

■ Setting options

The range of settable input levels differs according to the Offset and Pre-Amp settings.

3.3.2 Amplifying Input Level (Pre-Amp)
3.3.3 Correcting Input Level (Offset)

Table 3.3.1-1 Input Level Parameter

Offset Setting	Off		On	
Pre-Amp Setting	Off	On	Off	On
Minimum Value	–60.00 dBm	–80.00 dBm	–60.00 dBm + Offset Value	–80.00 dBm + Offset Value
Maximum Value	30.00 dBm	10.00 dBm	30.00 dBm + Offset Value	10.00 dBm + Offset Value

3.3.2 Amplifying Input Level (Pre-Amp)

The input level amplification is set using the MS2690A/MS2691A/ MS2692A-008/108 6 GHz Pre-Amp, MS2830A-008/108 or MS2850A-068/168 Preamplifier (hereinafter referred to as "Option 008").

> ***Note:*** Pre-Amp can be set only when Option 008 is installed.

■ Procedure

1. Enable or disable the function by pressing **Amplitude** > **Pre-Amp** on the main function menu.
2. When Pre-Amp is set, the Option 008 amplification value is reflected at ATT of the measurement parameters and the Pre-Amp On/Off status is displayed at the bottom of the screen.

■ Setting options

Table 3.3.2-1 Pre-Amp Options

Settings	Description
On	Enables Option 008 functions and improves level sensitivity up.
Off	Disables Option 008 functions

3.3.3 Correcting Input Level (Offset)

This is used to set the input level of the signal attenuated by the customer's attenuator, cable, etc.

■ Procedure

1. Enable or disable the function by pressing **Amplitude** > **Offset** on the main function menu.

> ***Note:*** When On (correct input level) is selected, specify the input level correction offset.
> ☞ 3.3.4 Setting Input Level Correction Offset Value (Offset Value)

2. When this Offset Value is set, it is reflected in Offset of the measurement parameters and in Mean Power of the Results window.

Figure 3.3.3-1 Sample Offset Setting

■ Setting options

Table 3.3.3-1 Offset Options

Settings	Description
On	Enables Offset function and corrects input level
Off	Disables the offset function.

3.3.4 Setting Input Level Correction Offset Value (Offset Value)

This is used to set the input level of the signal attenuated by the customer's attenuator, cable, etc.

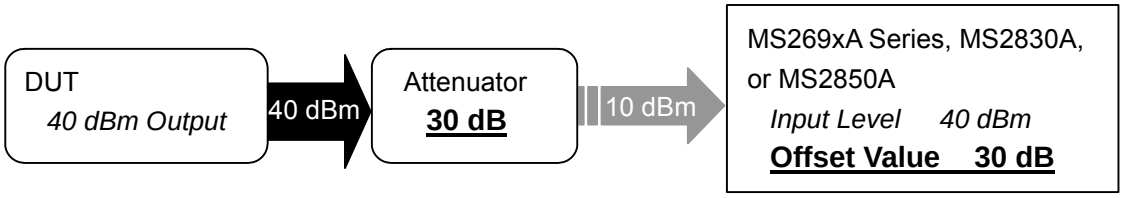

Figure 3.3.4-1 Outline of Input Level and Offset Value Settings

■ Procedure

1. Press **Amplitude** at the main function menu and press **Offset Value** to display the current Offset Value in the measurement parameters.
2. Press the numeric keypads and input the correction offset value in the **Offset Value** dialog box.

> ***Note:*** When the numeric keypads are pressed, the Offset Value dialog box opens automatically.

3. Press either the **dB** units button or **Set** to set the input value.
4. When this Offset Value is set, it is reflected in Offset of the measurement parameters and Mean Power of the Results window.

■ Setting options

Table 3.3.4-1 Offset Value Parameter

Setting	Settings
Maximum Value	99.99 dB
Minimum Value	–99.99 dB

3.3.5 Auto configuration of input level (Auto Range)

This function adjusts input level according to input signal.

■ Procedure

1. Press **Amplitude** on the main function menu to display the **Amplitude** function menu.
2. Press **Auto Range** to make adjustment.

> ***Note:*** Before adjustment, make sure to input signal to be measured.

3.4 Setting Common Items (Common Setting)

This sets common items.

3.4.1 Specifying Scrambling Code (Scrambling Code Synchronization)

This sets the scrambling code specification method for the measured signal.

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Scrambling Code Synchronization** to display the **Scrambling Code Synchronization** function menu.
3. Select the scrambling code specification method.

■ Setting options

Table 3.4.1-1 Scrambling Code Synchronization Options

Settings	Description
SCH	Automatically specifies the scrambling code. When the SCH channel is in the target measurement signal, this channel is analyzed and the scrambling code is captured automatically.
User Defined	Manually enter the scrambling code. Input this when there is no SCH in the target signal, or there is no correct scrambling code in SCH.

Note: Synchronization Chanel (SCH)
This channel is used to shorten the cell search executed when the mobile station detects an ideal connection.

3.4.2 Inputting Scrambling Code Used For Measured Signal (Scrambling Code)

This section describes how to input the scrambling code used for the measured signal.

> ***Note:*** This setting is enabled only when User defined is set in Scrambling Code Synchronization.
>
> ☞3.4.1 Specifying Scrambling Code (Scrambling Code Synchronization)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Scrambling Code** to display the **Scrambling Code** dialog box.
3. Enter the scrambling code, and press **Set**.
4. When **Scrambling Code** is set, the scrambling code input in **Scrambling Code** is displayed.

■ Setting options

Table 3.4.2-1 Scrambling Code Parameter

Setting Description	Settings
Maximum Value	1FFF
Minimum Value	0000

3.4.3 Selecting Sync Code (Frame Sync Code Type)

Select the code to use for synchronizations detection.

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Frame Sync Code Type** to display the **Frame Sync Code Type** function menu.
3. Select the synchronization code specification method.

■ Setting options

Table 3.4.3-1 Description of Frame Sync Code Type

Settings	Description
P-CPICH	Select when using a signal including P-CPICH.
User Defined	Select when the signal to be measured does not include P-CPICH, or when synchronization cannot be established due to lower output power. When this option is selected, it is necessary to specify in detail the channel for synchronization detection. ☞3.4.4 Setting Sync Detection Channel Spreading Factor (Frame Sync Spreading Factor) ☞3.4.5 Setting Sync Detection Channel Code Number (Frame Sync Code Number)

Note: Primary Common Pilot Chanel (P-CPICH)
P-CPICH is a type of synchronization channel; it is used to evaluate the scrambling code with base station ID to evaluate the modulation between base stations and to evaluate the output power.

Note: Specify a channel using SF64 min. as the sync detection channel and QPSK as the modulation method. (SF256 is recommended.)

Note: The constellation for the code domain analysis is displayed based on the phase of the first symbol on the channel selected by Frame Sync Code Type.

3.4.4 Setting Sync Detection Channel Spreading Factor (Frame Sync Spreading Factor)

Note:

☞3.4.3 Selecting Sync Code (Frame Sync Code Type)
☞3.4.6 Setting Input Signal Analysis Method (Channel Detection)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Frame Sync Spreading Factor** to display the **Frame Sync Spreading Factor** function menu.
3. Selects a channel spreading factor.

■ Setting options

Table 3.4.4-1 Frame Sync Spreading Factor Parameter

Settings	Description
4, 8, 16, 32, 64, 128, 256, 512	Select the sync detection channel spreading factor from the setting values.

3.4.5 Setting Sync Detection Channel Code Number (Frame Sync Code Number)

Set this when User Defined is selected at Frame Sync Code Type. P-CPICH cannot be used for sync detection of the target signal. Set this when performing sync detection for any channel. Set the Channelization Code Number used at sync detection here.

> ***Note:*** This setting is only enabled when User defined is set at Frame Sync Code Type AND Auto is set at Channel Detection.
> ☞3.4.3 Selecting Sync Code (Frame Sync Code Type)
> ☞3.4.6 Setting Input Signal Analysis Method (Channel Detection)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Frame Sync Code Number** to display the **Frame Sync Code Number** function menu.
3. Input the Channelization Code Number.

■ Setting options

Table 3.4.5-1 Frame Sync Code Number Parameter

Setting	Settings
Maximum Value	Frame Sync Spreading Factor set value – 1 ☞3.4.4 Setting Sync Detection Channel Spreading Factor (Frame Sync Spreading Factor)
Minimum Value	0

3.4.6 Setting Input Signal Analysis Method (Channel Detection)

The input signal is analyzed as a known signal.

> ***Note:*** The following parameters are disabled when a setting other than Auto is set.
>
> **Frame Sync Code Type**
> **Frame Sync Spreading Factor**
> **Frame Sync Code Number**
> **Active Code Threshold**
> **PICH CH Number**
>
> ☞3.4.3 Selecting Sync Code (Frame Sync Code Type)
> ☞3.4.4 Setting Sync Detection Channel Spreading Factor (Frame Sync Spreading Factor)
> ☞3.4.5 Setting Sync Detection Channel Code Number (Frame Sync Code Number)
> ☞3.4.8 Setting Channel Detection Threshold Value (Active Code Threshold)
> ☞3.4.9 Detecting PICH DTX (PICH CH Number)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Channel Detection** to display the **Channel Detection** function menu.
3. Set the input signal analysis method.

■ Setting options

Table 3.4.6-1 Channel Detection Options

Settings	Description
Auto	Detects automatically.
Test Model 1 16DPCH	Input signal analysis using Test Model 1 (DPCH x 16), TS25.141
Test Model 1 32DPCH	Input signal analysis using Test Model 1 (DPCH x 32), TS25.141
Test Model 1 64DPCH	Input signal analysis using Test Model 1 (DPCH x 64), TS25.141
Test Model 2	Input signal analysis using Test Model 2, TS25.141
Test Model 3 16DPCH	Input signal analysis using Test Model 3 (DPCH x 16), TS25.141
Test Model 3 32DPCH	Input signal analysis using Test Model 3 (DPCH x 32), TS25.141
Test Model 4	Input signal analysis using Test Model 4, TS25.141
Test Model 4 with CPICH	Input signal analysis including CPICH using Test Model 4 in accordance with TS25.141 Test Model 4 (CPICH Optional)
Test Model 5 6DPCH 2HS-PDSCH	Input signal analysis using Test Model 5 (DPCH x 6 HS-PDSCH x 2), TS25.141
Test Model 5 14DPCH 4HS-PDSCH	Input signal analysis using Test Model 5 (DPCH x 14 HS-PDSCH x 4), TS25.141
Test Model 5 30DPCH 8HS-PDSCH	Input signal analysis using Test Model 5 (DPCH x 30 HS-PDSCH x 8), TS25.141
Test Model 6 30DPCH 8HS-PDSCH	Input signal analysis using Test Model 6, TS25.141
User Defined	Conducts analysis with the channel configuration selected in **User Defined - Select File**.
User Defined Select File	Select the file containing the channel configuration, this file is used when **User Defined** is selected.
User Defined2 For Remote	Conducts analysis with the channel configuration specified in the remote-controlled User Defined file. For details, refer to MX269011A W-CDMA/HSPA Downlink Measurement Software Operation Manual Remote Control.

Note: For signal detection when Channel Detection is set to Auto, an incorrect channel may be detected if a signal with great noise is measured, because the automatic channel detection supports 64QAM.
An incorrect channel may also be detected if the modulation signal is biased.

■ Procedure for operating User Defined file

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Channel Detection** to display the **Channel Detection** function menu.
3. Press **User Defined - Select File**.
4. Select the channel configuration file from the directory D, which is: D:¥Anritsu Corporation¥Signal Analyzer¥User Data¥Channel Configuration¥W-CDMA Downlink
   Confirm the selection by double-clicking the file, or press **Set**.

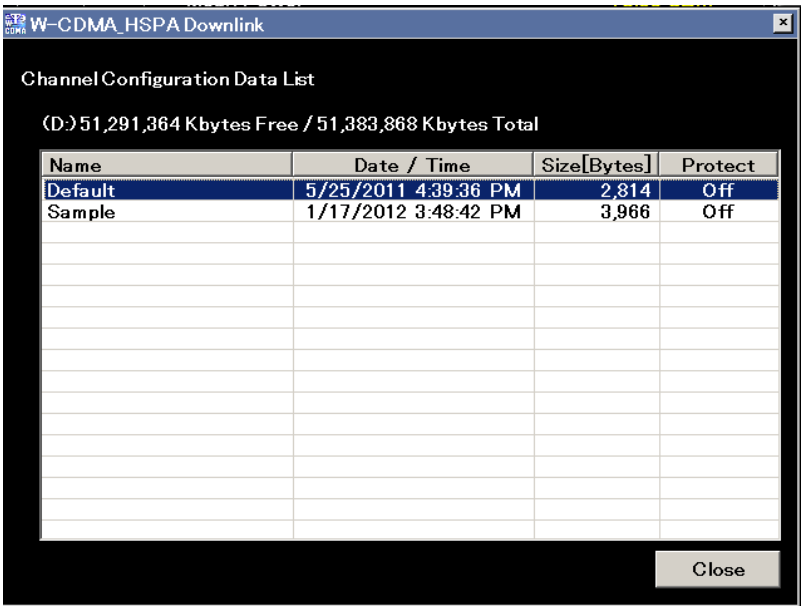

Figure 3.4.6-1 Selecting Channel Configuration File

5. The file will be loaded next time you select **Channel Detection** > **User Defined**.

Note:

For details on channel configuration file format and setting example, refer to Table 2.3.8-1 Channel Configuration List File Example, in MX269011A W-CDMA/HSPA Downlink Measurement Software Operation Manual Remote Control.

3.4.7 Reflecting Origin Offset in EVM Calculation (Origin Offset)

This specifies whether to include or exclude the origin offset in the EVM measurement.

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Origin Offset** and switch to Incl. or Excl.

■ Setting options

Table 3.4.7-1 Origin Offset Options

Settings	Description
Incl.	Calculates EVM, including origin offset.
Excl.	Calculates EVM, excluding origin offset.

3.4.8 Setting Channel Detection Threshold Value (Active Code Threshold)

This is used to set the channel detection level threshold value from the Mean Power.

> *Note:* This setting is enabled when Auto is set at Channel Detection.
> ☞ 3.4.6 Setting Input Signal Analysis Method (Channel Detection)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **Active Code Threshold** to display the **Active Code Threshold** dialog box.
3. Enter the threshold, and press **Set**.

■ Setting options

Table 3.4.8-1 Active Code Threshold Parameter

Setting	Settings
Maximum Value	–10.00 dB
Minimum Value	–40.00 dB

3.4.9 Detecting PICH DTX (PICH CH Number)

Set the PICH channelization code number to auto-detect PICH DTX.

> ***Note:*** This setting is enabled when Auto is set at Channel Detection.
> ☞3.4.6 Setting Input Signal Analysis Method (Channel Detection)

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press **PICH CH Number** to display the **PICH CH Number** dialog box.
3. Input the channelization code number.

■ Setting options

Table 3.4.9-1 PICH CH Number Parameter

Setting	Settings
Maximum Value	255
Minimum Value	0

3.4.10 SCH Interference of Relative CDE

Sets whether to include or exclude the Relative CDE of the beginning 256 chips of each slot for analysis. If included, all 2560 chips of each slot are measured; if excluded, the beginning 256 chips are excluded and the rest will be measured.

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press → to display page 2 of the **Common Setting** function menu.
3. Press **SCH Interference of Relative CDE**, and select **Incl**. or **Excl**.

■ Setting range

Table 3.4.10-1 SCH Interference of Relative CDE Setting

Setting Parameters	Description
Incl.	All 2560 chips of each slot are measured.
Excl.	The beginning 256 chips of each slot are excluded and the rest will be measured.

3.4.11 Setting Segment for Calculating Peak Relative CDE (Peak Relative CDE Detection Mode)

Set whether to calculate Peak Relative CDE in slot units or measurement interval units.

■ Procedure

1. Press **Common Setting** on the main function menu to display the **Common Setting** function menu.
2. Press → to display page 2 of the **Common Setting** function menu.
3. Press **Peak Relative CDE Detection Mode** to switch to either **Slot** or **Meas Int**.

■ Setting options

Table 3.4.11-1 Peak Relative Detection Mode Setting Range

Setting	Setting Description
Slot	Calculates in slot units.
Meas Int	Calculates in measurement interval units.

3.5 Modulation Analysis (Measure: Modulation Analysis)

3.5.1 Setting Starting Slot Number (Starting Slot Number)

This sets starting slot number specified within the W-CDMA frame.

> ***Note:*** The value set at Code Domain Starting Slot Number is not inherited by this setting.

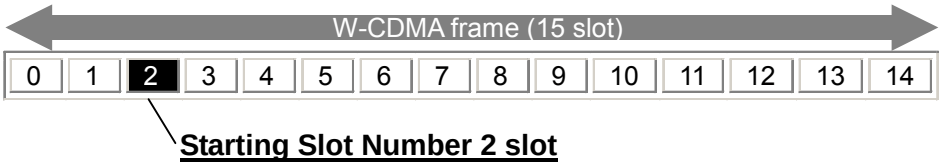

Figure 3.5.1-1 Outline of Starting Slot Number

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Modulation Analysis** to display the **Modulation Analysis** function menu.
3. Press **Analysis Time** to display the **Analysis Time** function menu.
4. Press **Starting Slot Number** to display the **Starting Slot Number** dialog box.
5. Enter the starting slot number for continuous measurement period analysis, and press **Set** to enter the input value.

■ Setting options

Table 3.5.1-1 Starting Slot Number Parameter

Setting	Settings
Maximum Value	14 slot
Minimum Value	0 slot

3.5.2 Setting Analysis Time (Measurement Interval)

> ***Note:*** The values set at Code Domain and Code vs. Time Measurement Interval are not inherited by this setting.

When 2 is set for the Starting Slot Number and 8 for the Measurement Interval, measurement between slots 2 and 9 is performed.

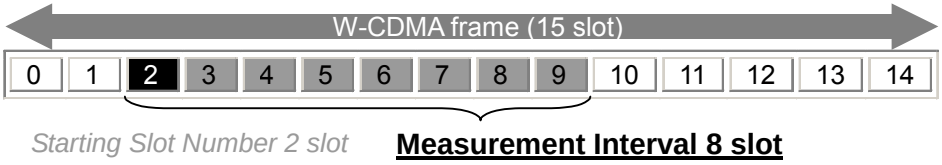

Figure 3.5.2-1 Outline of Measurement Interval

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Modulation Analysis** to display the **Modulation Analysis** function menu.
3. Press **Analysis Time** to display the **Analysis Time** function menu.
4. Press **Measurement Interval** to display the **Measurement Interval** dialog box.
5. Enter the slot number for analysis, and press **Set** to enter the input value.

■ Setting options

Table 3.5.2-1 Measurement Interval Parameter

Setting	Settings
Maximum Value	15 – **Starting Slot Number** setting slot ☞3.5.1 Setting Starting Slot Number (Starting Slot Number)
Minimum Value	1 slot

3.5.3 Selecting Graph Display (Trace Mode)

This selects a graphical result in the bottom Graph window.

■ Procedure

1. Press Trace on the front panel to display the **Trace** function menu.
2. Press **Trace Mode** to display the **Trace Mode** function menu.
3. Select a graph to be displayed in the bottom Graph window.

■ Setting options

Table 3.5.3-1 Trace Mode Options

Settings	Description
EVM vs. Chip	Displays vector error at each chip.
Mag. Error vs. Chip	Displays magnitude error at each chip.
Phase Error vs. Chip	Displays phase error at each chip.
Summary	Displays the numeric results.

3.5.4 Setting Vertical Scale for the Bottom Graph Window (Trace Scale)

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

> ***Note:*** This setting is disabled when Trace Mode is set to Summary.

■ Procedure

1. Press Trace on the front panel to display the Trace function menu.
2. Press **Scale** to display the ******* function menu.

   > ***Note:*** Input the setting for the selected graph at ***.

3. Select vertical scale of bottom Graph window.

■ Setting options

Table 3.5.4-1 Trace Scale Options

Graph	Settings	Description
EVM vs. Chip	5%, 10%, 20%, 50%	Select EVM vs. Chip graph scale upper limit. Lower limit fixed at 0%.
Mag. Error vs. Chip	±5%, ±10%, ±20%, ±50%	Select Mag Error vs. Chip graph scale upper and lower limits based on 0.
Phase Error vs. Chip	±5 degree, ±10 degree, ±20 degree, ±50 degree	Select Phase Error vs. Chip graph scale upper and lower limits based on 0 degrees.

3.5.5 Setting Measurement Results Processing Method (Storage Mode)

Set the calculation method and display method for the measurement results displayed in the Results window after measurement is completed.

■ Procedure

1. Press Trace on the front panel to display the **Trace** function menu.
2. Press **Storage** to display the **Storage** function menu.
3. Press **Mode** to display the **Storage Mode** list box.
4. Select the format to be displayed on the Result window, and confirm with **Set**.

■ Setting options

Table 3.5.5-1 Storage Mode Setting Options

Settings	Description
Off	Displays the numerical results in a single measurement.
Average	Displays the average for specified number of measurements.
Average & MAX	Displays the average and maximum for specified number of measurements.

3.5.6 Setting Measurement Count (Storage Count)

This section describes how to set the number of measurements (number of captures). This value is used for selecting Average or Average & Max to Storage:Mode.

When 2 is set for Starting Slot Number, 7 for Measurement Interval, Average & Max for Storage:Mode, and 3 for Storage:Count, the measurement between slots 2 and 8 is performed three times and the average and maximum results are displayed.

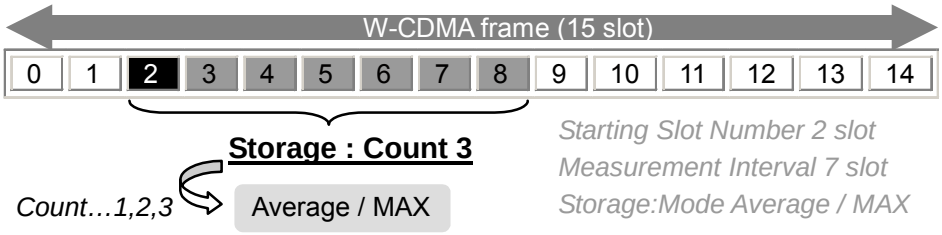

Figure 3.5.6-1 Outline of Storage Count

■ Procedure

1. Press Trace on the front panel to display the **Trace** function menu.
2. Press **Storage** to display the **Storage** function menu.
3. Press **Count** to display the **Storage Count** dialog box.
4. Enter the measurement count, and press **Set**.

■ Setting options

Table 3.5.6-1 Outline of Storage Count

Setting	Settings
Maximum Value	9999
Minimum Value	2

3.5.7 Numerical Results

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval. According to the storage mode specified, the results in a single measurement are displayed for Off, the averages of the results in the specified number of measurements for Average, and the averages and the maximums of the results in the specified number of measurements for Average & Max, respectively.

> ***Note:*** **The contents of the Result window differ if Trace Mode is set to Summary.**

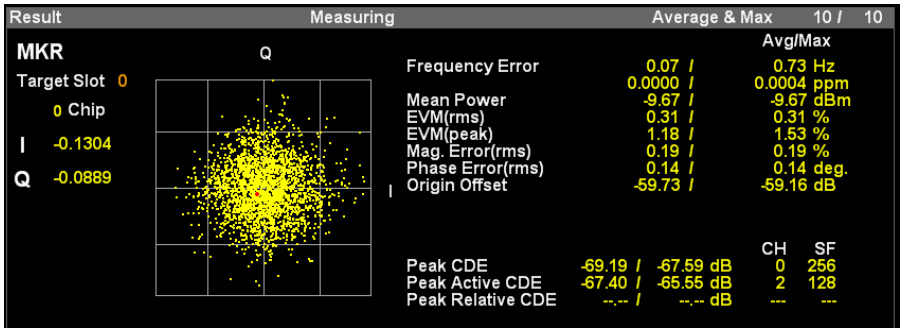

Figure 3.5.7-1 Result Window
(Trace Mode: EVM vs Chip/Magnitude Error vs Chip/Phase Error vs Chip)

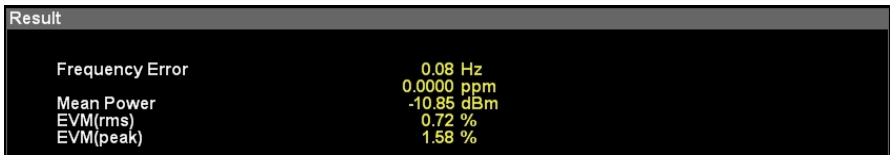

Figure 3.5.7-2 Result window (Trace Mode: Summary)

Table 3.5.7-1 Result Window Description (Trace Mode: EVM vs Chip/Magnitude Error vs Chip/Phase Error vs Chip)

Display Item	Description
Frequency Error	Displays frequency error in the analysis segment.
Mean Power	Displays mean power in the analysis segment.
EVM(rms)	Displays vector error in RMS in the analysis segment.
EVM(peak)	Displays peak of vector error in each chip in the analysis segment.
Mag. Error(rms)	Displays magnitude error in RMS in the analysis segment.
Phase Error(rms)	Displays phase error in RMS in the analysis segment.
Origin Offset	Displays origin offset in the analysis segment.
Time Offset	Displays time offset between the triggered time and slot boundary of slot#0 of the signal measured. This result is displayed when trigger switch is set to On. ☞ 3.9 Setting Trigger (Trigger)
Peak CDE	Displays peak of code domain error of the codes with spreading factor 256 in analysis time. The code number (CH), spreading factor (SF), and axis (IQ) of the code with peak value are also displayed.
Peak Active CDE	Displays peak of code domain error of the active codes in analysis segment. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed.
Peak Relative CDE	Displays peak value in analysis segment for code domain error at spreading factor of 16 AND 64QAM modulation method. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed. The results are not displayed if a code that has the spreading factor of 16 and the 16QAM modulation method is not detected. Note that the code number (CH) is not displayed if Peak Relative CDE Detection Mode is set to Means Int and Storage Mode is set to Average&Max. For details about the relevant code numbers (CH), see Summary (Page2). ☞ 3.4.11 Setting Segment for Calculating Peak Relative CDE (Peak Relative CDE Detection Mode) ☞ 3.5.8.5.2 Summary (Page2)

Note: Storage operation if Peak Relative CDE Detection Mode is set to Mean Int

If Storage Mode is set to Average or Average&Max, the average and maximum values are calculated as follows.

Maximum:

The relative CDE of each storage area is calculated for each channel, and then the peak value is selected.

Average:

The average relative CDE of all storage areas is calculated for each channel, and then the peak value is selected.

Table 3.5.7-2 Result Window Description (Trace Mode: Summary)

Display Item	Description
Frequency Error	Displays frequency error in the analysis segment.
Mean Power	Displays mean power in the analysis segment.
EVM(rms)	Displays vector error in RMS in the analysis segment.
EVM(peak)	Displays peak of vector error in each chip in the analysis segment.

3.5.8 Graphical Results

The measurement results for the analysis segment (range set by Starting Slot Number and Measurement Interval) are displayed. When Storage is set, the measurement results for the analysis segment at the last Storage are displayed.
The displayed interval is one slot, and a graphical result of the slot specified with Target Slot Number is displayed.

3.5.8.1 IQ Constellation

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

> ***Note:*** The IQ constellation is not displayed when Trace Mode is set to Summary.

☞ 3.5.9.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

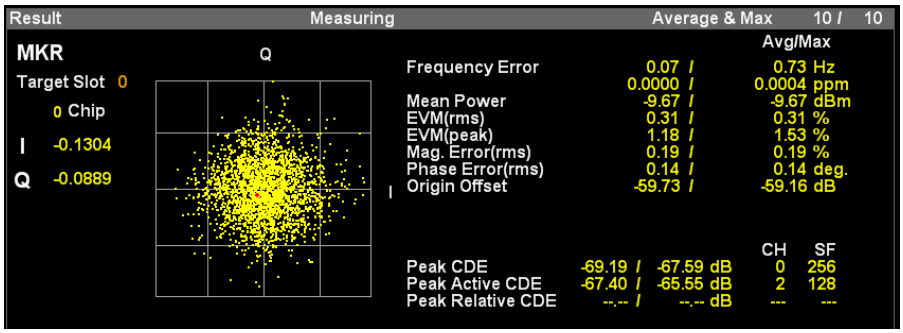

Figure 3.5.8.1-1 IQ Constellation

Table 3.5.8.1-1 IQ Constellation Display Description

Display Item	Description
Target Slot	Displays slot number specified with Target Slot Number.
Chip	Displays chip number specified with Constellation Chip Number.
I/Q	Displays I and Q amplitude values for chip specified by Constellation Chip Number.

3.5.8.2 EVM vs. Chip

The vector error in the slot specified with Target Slot Number is displayed in the bottom Graph window. The vector error at the marker-selected chip is displayed in red.

☞ 3.5.9.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

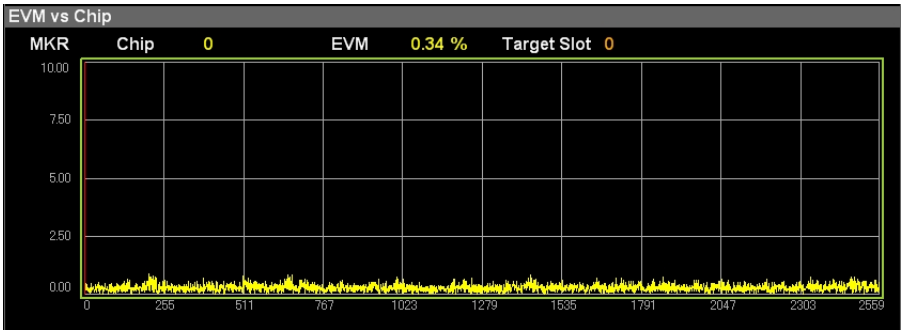

Figure 3.5.8.2-1 EVM vs. Chip

Table 3.5.8.2-1 EVM vs. Chip Display Content

Display Item	Description
Chip	Displays chip number specified with Bottom Graph Marker Number.
EVM	Displays vector error at chip specified with Bottom Graph Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.5.8.3 Magnitude Error vs. Chip

The amplitude error in the slot specified with Target Slot Number is displayed in the bottom Graph window. The amplitude error at the marker-selected chip is displayed in red.

☞ 3.5.9.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

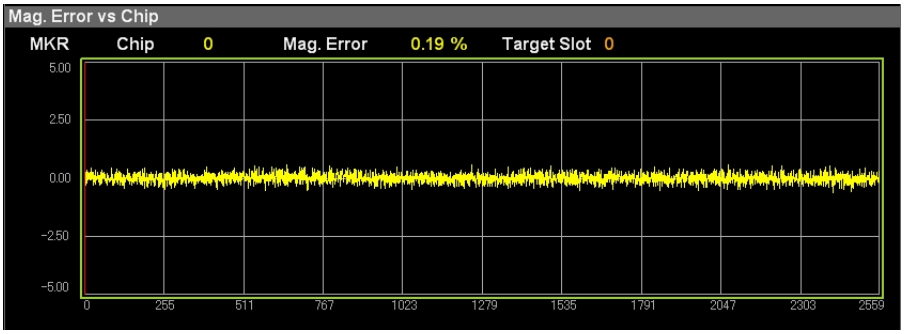

Figure 3.5.8.3-1 Magnitude Error vs. Chip

Table 3.5.8.3-1 Magnitude Error vs. Chip Display Content

Display Item	Description
Chip	Displays chip number specified with Bottom Graph Marker Number.
Mag. Error	Displays magnitude error at the chip specified with Bottom Graph Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.5.8.4 Phase Error vs. Chip

The phase error in the slot specified with Target Slot Number is displayed in the bottom Graph window. The phase error at the marker-selected chip is displayed in red.

3.5.9.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

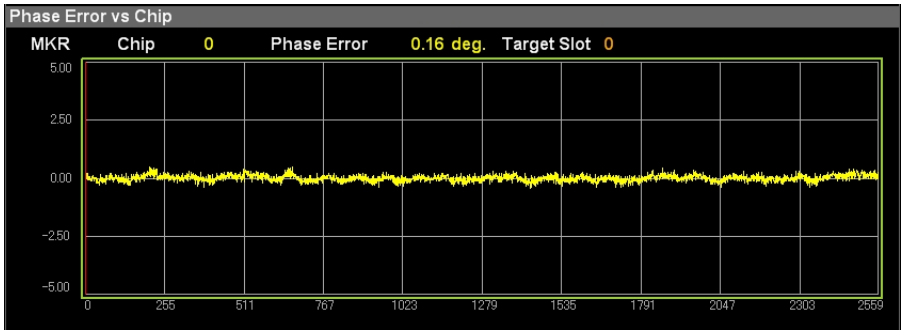

Figure 3.5.8.4-1 Phase Error vs. Chip

Table 3.5.8.4-1 Phase Error vs. Chip Display Content

Display Item	Description
Chip	Displays chip number specified with Bottom Graph Marker Number.
Phase Error	Displays phase error at the chip specified with Bottom Graph Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.5.8.5 Summary

3.5.8.5.1 Summary (Page1)

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval. According to the storage mode specified, the results in a single measurement are displayed for Off, the averages of the results in the specified number of measurements for Average, and the averages and the maximums of the results in the specified number of measurements for Average & Max, respectively.

The Summary window shows the results displayed in the Result window and other results on page 1.

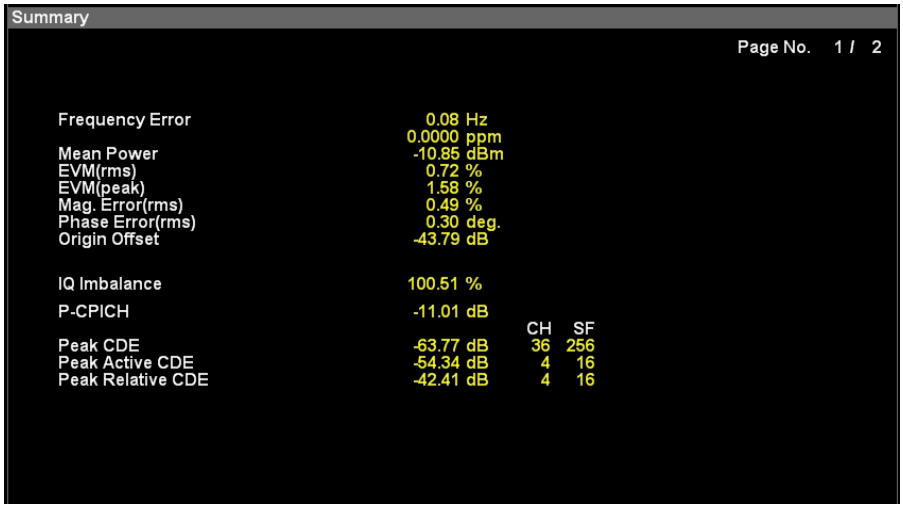

Figure 3.5.8.5.1-1 Summary(Page1)

Table 3.5.8.5.1-1 Summary(Page1) Display Content

Display Item	Description
Frequency Error	Displays frequency error in the analysis segment.
Mean Power	Displays mean power in the analysis segment.
EVM(rms)	Displays vector error in RMS in the analysis segment.
EVM(peak)	Displays peak of vector error in each chip in the analysis segment.
Mag. Error(rms)	Displays magnitude error in RMS in the analysis time.
Phase Error(rms)	Displays phase error in RMS in the analysis segment.
Origin Offset	Displays origin offset in the analysis segment.
Time Offset	Displays time offset between the triggered time and slot boundary of slot#0 of the signal measured. This result is displayed when trigger switch is set to On. 3.9 Setting Trigger (Trigger)
IQ imbalance	Displays the IQ amplitude balance value in the analysis segment.
P-CPICH Power	Displays code power for P-CPICH in the analysis segment.

Table 3.5.8.5.1-1 Result Window Display Content (Cont'd)

Display Item	Description
Peak CDE	Displays peak of code domain error of the codes with spreading factor 256 in analysis segment. The code number (CH) and the spreading factor (SF) of the code with peak value are also displayed.
Peak Active CDE	Displays peak of code domain error of the active codes in analysis segment. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed.
Peak Relative CDE	Displays peak value in analysis segment for code domain error at spreading factor of 16 AND 64QAM modulation method. The code number (CH) and spreading factor (SF) of the active code with peak value are also displayed. The results are not displayed if the code with the spreading factor of 16 AND the 16QAM modulation method is not detected. Note that the code number (CH) is not displayed if Peak Relative CDE Detection Mode is set to Means Int and Storage Mode is set to Average&Max. For details about the relevant code numbers (CH), see Summary (Page2). Note that the code number (CH) is not displayed if Peak Relative CDE Detection Mode is set to Means Int and Storage Mode is set to Average&Max. For details about the relevant code numbers (CH), see Summary (Page2). ☞ 3.4.11 Setting Segment for Calculating Peak Relative CDE (Peak Relative CDE Detection Mode) ☞ 3.5.8.5.2 Summary (Page2)

Note: Storage operation if Peak Relative CDE Detection Mode is set to Mean Int

If Storage Mode is set to Average or Average&Max, the average and maximum values are calculated as follows.

Maximum:

The relative CDE of each storage area is calculated for each channel, and then the peak value is selected.

Average:

The average relative CDE of all storage areas is calculated for each channel, and then the peak value is selected.

3.5.8.5.2 Summary (Page2)

The Result window shows the numerical results in the analysis time specified with the Starting Slot Number and Measurement Interval. According to the storage mode specified, the results in a single measurement are displayed for Off, the averages of the results in the specified number of measurements for Average, and the averages and the maximums of the results in the specified number of measurements for Average & Max, respectively.

Page 2 shows measurement results of Relative CDE.

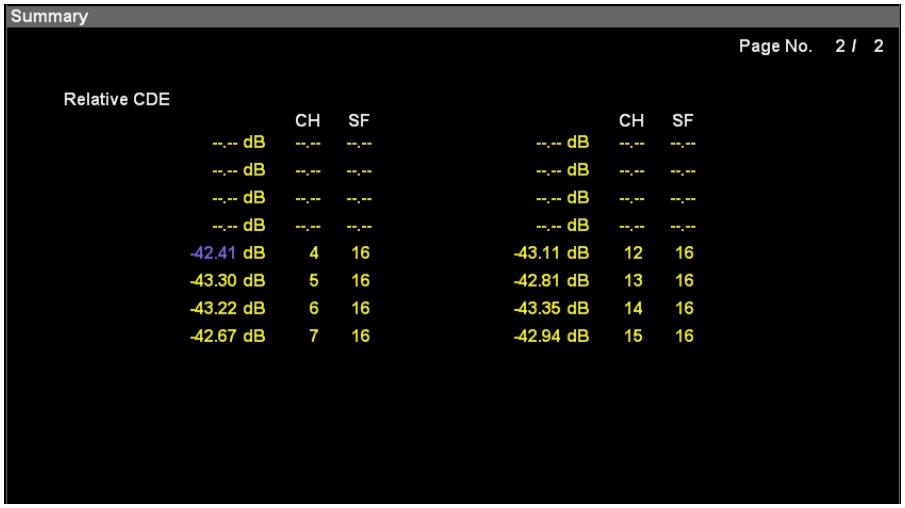

Figure 3.5.8.5.2-1 Summary (Page2)

Table 3.5.8.5.2-1 Summary(Page2) Display Contents

Display Item	Description
Relative CDE	Displays code domain error values in the analysis segment for codes that have the spreading factor of 16 and the 64QAM modulation method, according to the code number. The code number (CH) and spreading factor (SF) of the active code are also displayed. The results are not displayed if a code that has the spreading factor of 16 and the 16QAM modulation method is not detected. Among the averages and maximums of the channels, the largest result is displayed in purple.

3.5.9 Setting Markers (Marker)

3.5.9.1 Enabling/Disabling Markers (Marker)

> ***Note:*** This setting is disabled when Trace Mode is set to Summary.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Enable or disable by pressing **Marker**.

■ Setting options

Table 3.5.9.1-1 Marker Options

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

3.5.9.2 Selecting Operation Graph (Constellation Select/Bottom Graph Select)

This sets the target of operation for the rotary knob and the cursor key to Constellation or Bottom Graph Window.

> ***Note:*** This setting is disabled when Trace Mode is set to Summary.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Constellation Select** or Bottom Graph Select to select the operation graph.

■ Setting options

Table 3.5.9.2-1 Operation Graph Settings

Settings	Description
Constellation Select	Selects IQ Constellation.
Bottom Graph Select	Select bottom graph window.

3.5.9.3 Setting Graph Marker Position (Constellation Chip Number / Bottom Graph Marker Number)

This sets marker position in Constellation or bottom Graph window with chip number.

> ***Note:*** This setting is disabled when Trace Mode is set to Summary.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Constellation Select** or **Bottom Graph Select** to select the operation graph.
3. Press the numeric keypads and input the correction offset value in the *** dialog box.

> ***Note:*** When the numeric keypads are pressed, the *** dialog screen is opened automatically.
> ***Note:*** Input the marker setting for the selected graph at ***.

4. Press **Set** to enter the input value.

■ Setting options

Table 3.5.9.3-1 Operation Graph Setting Range

Graph	Settings	Description
Constellation Chip Number	0 to 2559	Sets marker target (Chip Number) in Constellation results display
Bottom Graph Marker Number	0 to 2559	Sets marker target (Chip Number) in Bottom Graph results display

3.5.9.4 Setting Slot Number for Analysis Results Display (Target Slot Number)

Set the slot number for displaying analysis results. The results for the specified slot number are displayed in the top graph window and bottom graph window.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Target Slot Number** at the **Marker** function menu to display the Target Slot Number currently set in the measurement parameters.
3. Press the numeric keypads and input the slot number for displaying the analysis result in the **Target Slot Number** dialog box.

> ***Note:*** The **Target Slot Number** dialog box is displayed automatically when the numeric keypads are pressed.

4. Press **Set** to enter the input value.
5. When setting the Target Slot Number, it is reflected in Target Slot of the measurement window and results window.

■ Setting options

Table 3.5.9.4-1 Target Slot Number Parameter

Description	Settings
Maximum Value	Starting Slot Number + Measurement Interval – 1 slot ☞3.5.1 Setting Starting Slot Number (Starting Slot Number) ☞3.5.2 Setting Analysis Time (Measurement Interval)
Minimum Value	**Starting Slot Number** setting ☞3.5.1 Setting Starting Slot Number (Starting Slot Number)

3.6 Code Domain Analysis (Measure: Code Domain)

3.6.1 Setting Starting Slot Number (Starting Slot Number)

This sets starting slot number specified within the W-CDMA frame.

> ***Note:*** The value set at Starting Slot Number of Modulation Analysis is not inherited by this setting.

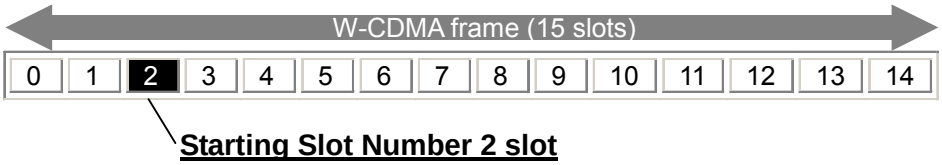

Figure 3.6.1-1 Outline of Starting Slot Number

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press **Analysis Time** to display the **Analysis Time** function menu.
4. Press Starting Slot Number to display the Starting Slot Number dialog box.
5. Enter the starting slot number for continuous measurement period analysis, and press **Set** to enter the input value.

■ Setting options

Table 3.6.1-1 Starting Slot Number Options

Description	Settings
Maximum Value	14 slot
Minimum Value	0 slot

3.6.2 Setting Analysis Time (Measurement Interval)

> ***Note:*** The values set at Modulation Analysis and Measurement Interval of Code vs. Time are not inherited by this setting.

When 2 is set for the Starting Slot Number and 8 for the Measurement Interval, measurement between slots 2 and 9 is performed.

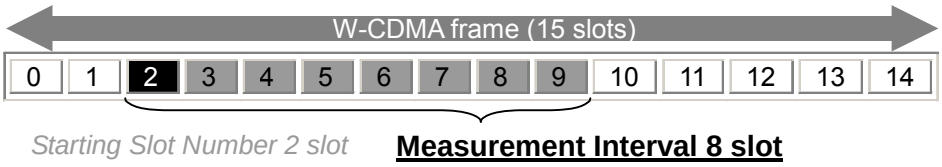

Figure 3.6.2-1 Outline of Measurement Interval

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press **Analysis Time** to display the **Analysis Time** function menu.
4. Press Measurement Interval to display the Measurement Interval dialog box.
5. Enter the slot number for analysis, and press **Set** to enter the input value.

■ Setting options

Table 3.6.2-1 Measurement Interval Parameter

Description	Settings
Maximum Value	15 – **Starting Slot Number** setting ☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number)
Minimum Value	1 slot

3.6.3 Specifying Code Number (Code Number)

Specify the results display as the SF512-converted code number.

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press Code Number.
4. Press the numeric keypads and input the code number in the **Code Number** dialog box.

   > ***Note:*** The **Code Number** dialog box is displayed automatically when the numeric keypads are pressed.

5. Press **Set** to enter the input value.

■ Setting options

Table 3.6.3-1 Code Number Parameter

Description	Settings
Maximum Value	511
Minimum Value	0

3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

Set the slot number for displaying the analysis results. The specified slot numeric and graphical results are displayed on the screen.

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press Target Slot Number.
4. Press the numeric keypads and input the slot number for displaying the analysis result in the **Target Slot Number** dialog box.

   Note: The **Target Slot Number** dialog box is displayed automatically when the numeric keypads are pressed.

5. Press **Set** to enter the input value.
6. When setting the Target Slot Number, it is reflected in Target Slot of the measurement window and results window.

■ Setting options

Table 3.6.4-1 Target Slot Number Parameter

Description	Settings
Maximum Value	Starting Slot Number + Measurement Interval – 1 slot ☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number) ☞ 3.6.2 Setting Analysis Time (Measurement Interval)
Minimum Value	**Starting Slot Number** setting ☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number)

3.6.5 Selecting Graph Display (Trace Mode)

Set the graph results displayed in the top and bottom graph window.

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press → to display page 2 of the **Code Domain** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Trace Mode** to display the **Trace Mode** function menu.
6. Select the graph displayed in the top and bottom graph window.

■ Setting options

Table 3.6.5-1 Trace Mode Options

Settings	Description
Code Domain Trace	Power: Displays code domain power result. Error: Displays code domain error result.
Constellation	Displays symbol constellation of specified code in specified slot.
EVM vs. Symbol	Displays vector error at each symbol of specified code in specified slot.
Mag. Error vs. Symbol	Displays magnitude error at each symbol of specified code in specified slot.
Phase Error vs. Symbol	Displays phase error at each symbol of specified code in specified slot.
Code Power vs. Symbol	Displays power at each symbol of specified code in specified slot.

3.6.6 Setting Vertical Scale for the Upper Graph Window (Code Domain Scale)

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

☞ 3.6.5 Selecting Graph Display (Trace Mode)

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press → to display page 2 of the **Code Domain** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Scale** to display the **Scale** function menu.
6. Press **Code Domain Scale** to display the **Code Domain *** Scale** function menu.

   Note: *** stands for the name of selected mode.

7. Select the maximum/minimum scale value of Upper graph window.

■ Setting options

Table 3.6.6-1 Code Domain Scale Options

Graph	Settings	Description
Code Domain Power	20 dB, 40 dB 60 dB, 80 dB	Selects scale for Code Domain Power graph Updates lower limit using set value Maximum fixed at 0 dB
Code Domain Error		Selects Code Domain Error graph scale Updates upper limit using set value Minimum fixed at –80 dB

3.6.7 Setting Vertical Scale for the Bottom Graph Window (Trace Scale)

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

■ Procedure

1. Call **Measure** function menu.
   Open the function menu as shown below.
   - Press **Measure** on the main function menu to display the **Measure** function menu.
   - Press Measure on the front panel to display the **Measure** function menu.
2. Press **Code Domain** to display the **Code Domain** function menu.
3. Press → to display page 2 of the **Code Domain** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Scale** to display the **Scale** function menu.
6. Press **Trace Scale** to display the ******* function menu.

> ***Note:*** Input the setting for the selected graph at ***.

> ***Note:*** You cannot set **Trace Scale** when **Constellation** is selected for the graph.

7. Select vertical scale of bottom Graph window.

■ Setting options

Table 3.6.7-1 Trace Scale Parameter

Graph	Settings	Description
EVM vs. Symbol	5%, 10%, 20%, 50%	Select EVM vs. Symbol graph scale upper limit. Lower limit fixed at 0%.
Mag. Error vs. Symbol	±5%, ±10%, ±20%, ±50%	Select Mag Error vs. Symbol graph scale upper and lower limits based on 0%
Phase Error vs. Symbol	±5 degrees, ±10 degrees, ±20 degrees, ±50 degrees	Select Phase Error vs. Symbol graph scale upper and lower limits based on 0%
Code Power vs. Symbol	20 dB, 40 dB, 60 dB, 80 dB	Select Code Power vs. Symbol graph scale Updates lower limit using set value Maximum fixed at 0 dB

3.6.8 Numerical Results

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

3.6.1 Setting Starting Slot Number (Starting Slot Number)
3.6.2 Setting Analysis Time (Measurement Interval)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

Figure 3.6.8-1 Result Window

Table 3.6.8-1 Numerical Result Description

Display Item	Description
Target Slot	Displays slot number specified with Target Slot Number.
Total Active CH	Displays the number of active channels in the slot specified with Target Slot Number.
Mean Power	Displays mean power in the slot specified with Target Slot Number.
P-CPICH	Displays code power for P-CPICH of slot specified at Target Slot Number
P-SCH	Displays code power for P-SCH of slot specified by Target Slot Number
S-SCH	Displays code power for S-SCH of slot specified at Target Slot Number
EVM (rms)	Displays vector error in RMS of the specified code in the slot specified with Target Slot Number.
EVM (peak)	Displays peak of vector error in each symbol of the specified code in the slot specified with Target Slot Number.
Mag. Error	Displays magnitude error in RMS of the specified code in the slot specified with Target Slot Number.
Phase Error	Displays RMS amplitude error of Phase Error for slot specified at Target Slot Number and for specified analysis code
Code Power	Displays mean power of the specified code in the slot specified with Target Slot Number.

3.6.9 Graphical Results

Display the graph results for the slot specified at Target Slot Number in the analysis segment (range specified by Starting Slot Number and Measurement Interval).

☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number)
☞ 3.6.2 Setting Analysis Time (Measurement Interval)
☞ 3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

3.6.9.1 Code Domain Power

The code domain power in the slot specified with Target Slot Number is displayed in the upper Graph window. The code power at the marker-selected code is displayed in red.

☞ 3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

Figure 3.6.9.1-1 Code Domain Power Display

Table 3.6.9.1-1 Code Domain Power Description

Display Item	Description
Code Number	Displays code number power specified with Code Number.
CH/SF	Displays channelization code number and spreading factor for code specified with Code Number
Modulation	Displays code modulation method specified with Code Number.
Power	Displays power of the code specified with Code Number.
Error	Displays error of the code specified with Code Number.

3.6.9.2 Code Domain Error

The code domain error in the slot specified with Target Slot Number is displayed in the upper Graph window. The code error at the marker-selected code is displayed in red.

3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

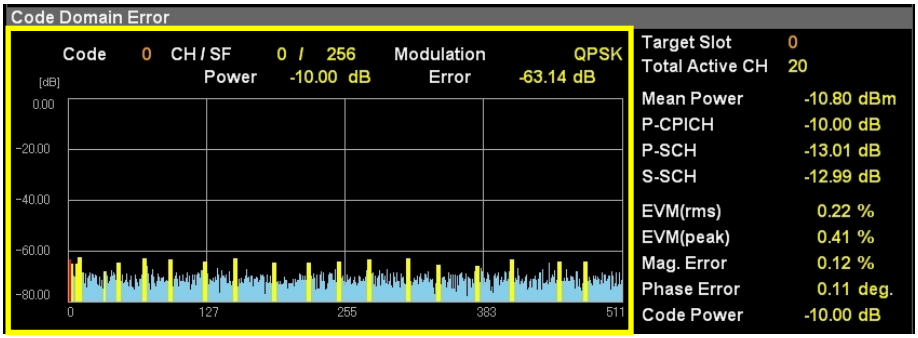

Figure 3.6.9.2-1 Code Domain Error Display

Table 3.6.9.2-1 Code Domain Error Description

Settings	Description
Code Number	Displays error value of code number specified with Code Number.
CH/SF	Displays channelization code number and spreading factor for code specified with Code Number
Modulation	Displays code modulation method specified with Code Number.
Power	Displays power of the code specified with Code Number.
Error	Displays error of the code specified with Code Number.

3.6.9.3 Constellation

Display the slot specified at Target Slot Number and the symbol constellation for the code specified by Code Number at the bottom graph window. The constellation at the marker-selected symbol is displayed in red.

3.6.3 Specifying Code Number (Code Number)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)
3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

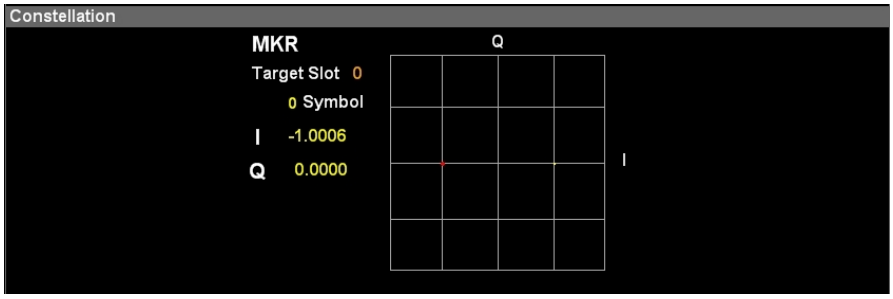

Figure 3.6.9.3-1 Constellation Display

Table 3.6.9.3-1 Constellation Display Description

Settings	Description
Target Slot	Displays slot number specified with Target Slot Number.
Symbol	Displays symbol number specified with Marker Number.
I, Q	Displays either I or Q amplitude at the symbol specified with Marker Number.

3.6.9.4 EVM vs. Symbol

Display the slot specified at Target Slot Number and the vector error for the code specified by Code Number at the bottom graph window. The vector error at the marker-selected symbol is displayed in red.

3.6.3 Specifying Code Number (Code Number)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)
3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

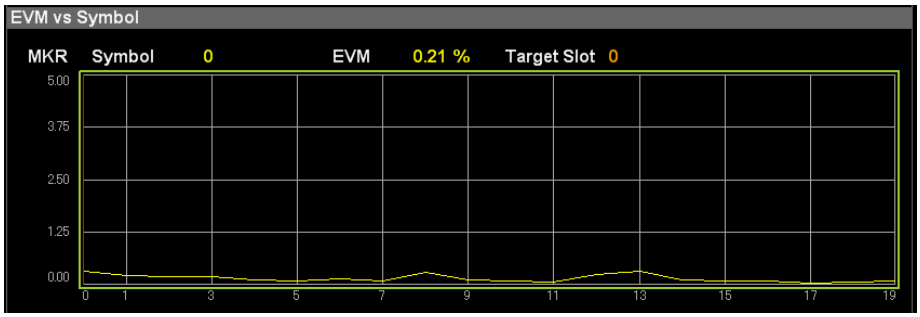

Figure 3.6.9.4-1 EVM vs. Symbol Display

Table 3.6.9.4-1 EVM vs. Symbol Description

Settings	Description
Symbol	Displays symbol number specified with Marker Number.
EVM	Displays vector error at the symbol specified with Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.6.9.5 Magnitude Error vs. Symbol

Display the slot specified at Target Slot Number and the amplitude error for the code specified by Code Number at the bottom graph window. The magnitude error at the marker-selected symbol is displayed in red.

3.6.3 Specifying Code Number (Code Number)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)
3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

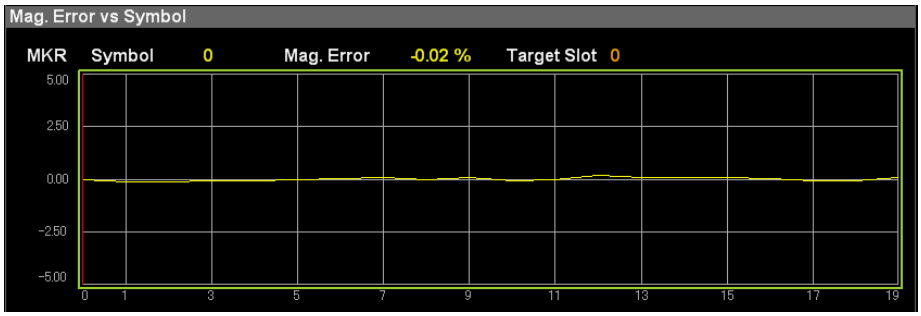

Figure 3.6.9.5-1 Magnitude Error vs. Chip Display

Table 3.6.9.5-1 Magnitude Error vs. Symbol Description

Settings	Description
Symbol	Displays symbol number specified with Marker Number.
Mag. Error	Displays magnitude error at the symbol specified with Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.6.9.6 Phase Error vs. Symbol

Display the slot specified at Target Slot Number and the phase error for the code specified by Code Number at the bottom graph window. The magnitude error at the marker-selected symbol is displayed in red.

3.6.3 Specifying Code Number (Code Number)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)
3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

Figure 3.6.9.6-1 Phase Error vs. Symbol Display

Table 3.6.9.6-1 Phase Error vs. Symbol Description

Settings	Description
Symbol	Displays symbol number specified with Marker Number.
Phase Error	Displays phase error at the symbol specified with Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.6.9.7 Code Power vs. Symbol

Display the slot specified at Target Slot Number and the code power for the code specified by Code Number at the bottom graph window. The code power at the marker-selected symbol is displayed in red.

3.6.3 Specifying Code Number (Code Number)
3.6.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)
3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

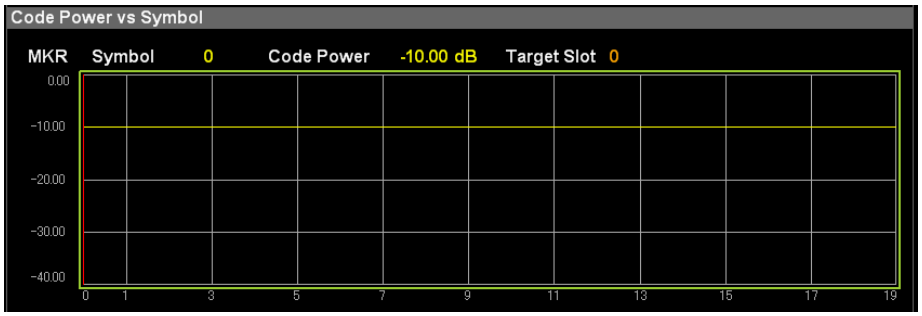

Figure 3.6.9.7-1 Code Power vs. Symbol Display

Table 3.6.9.7-1 Code Power vs. Symbol Description

Settings	Description
Symbol	Displays symbol number specified with Marker Number.
Code Power	Displays code power at the symbol specified with Marker Number.
Target Slot	Displays slot number specified with Target Slot Number.

3.6.10 Setting Markers (Marker)

3.6.10.1 Enabling/Disabling Markers (Maker)

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Enable or disable by pressing **Marker**.

■ Setting options

Table 3.6.10.1-1 Marker Options

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

3.6.10.2 Specifying Code Number (Code Number)

Specify the results display as the SF512-converted code number.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press Code Number.
3. Press the numeric keypads and input the code number in the **Code Number** dialog box.

   > ***Note:*** The **Code Number** dialog box is displayed automatically when the numeric keypads are pressed.

4. Press **Set** to enter the input value.

■ Setting options

Table 3.6.10.2-1 Code Number Parameter

Setting	Settings
Maximum Value	511
Minimum Value	0

3.6.10.3 Setting Marker Position in Bottom Graph Window (Marker Number)

This sets Marker Position of bottom Graph Window.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press Marker Number.
3. Press the numeric keypads and input the correction offset value in the **Marker Number** dialog box.

> ***Note:*** The **Marker Number** dialog box is displayed automatically when the numeric keypads are pressed.

4. Press **Set** to enter the input value.

■ Setting options

Table 3.6.10.3-1 Marker Number Options

Setting	Settings
Maximum Value	Symbol Number detected as Code specified at Code Number – 1 ☞ 3.6.10.2 Specifying Code Number
Minimum Value	0 symbols

3.6.10.4 Setting Slot Number for Displaying Analysis Results (Target Slot Number)

Set the slot number for displaying the analysis results.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Target Slot Number** at the **Marker** function menu to display the current Target Slot Number in the measurement parameters.
3. Press the numeric keypads and input the slot number for displaying the analysis result in the **Target Slot Number** dialog box.

> ***Note:*** The **Target Slot Number** dialog box is displayed automatically when the numeric keypads are pressed.

4. Press **Set** to enter the input value.
5. When setting the Target Slot Number, it is reflected in Target Slot of the measurement parameters and the results window.

■ Setting options

Table 3.6.10.4-1 Target Slot Number Options

Setting	Settings
Maximum Value	Starting Slot Number + Measurement Interval – 1 slot ☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number) ☞ 3.6.2 Setting Analysis Time (Measurement Interval)
Minimum Value	**Starting Slot Number** setting ☞ 3.6.1 Setting Starting Slot Number (Starting Slot Number)

3.7 Measuring Code Time Variation (Code vs. Time)

3.7.1 Setting Analysis Time (Measurement Interval)

This sets the continuous measurement period for analysis with single capture. The analysis start location is usually slot 0.

> ***Note:*** The values specified at Modulation Analysis and Measurement Interval of Code Domain are not inherited by this setting.

When 18 is set at Measurement Interval, the analysis slots are 0 to 17.

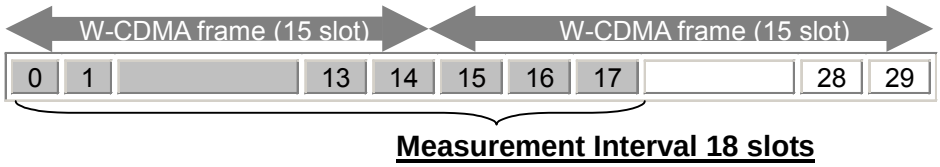

Figure 3.7.1-1 Outline of Measurement Interval

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Code vs. Time** to display the **Code vs. Time** function menu.
3. Press **Analysis Time** to display the **Analysis Time** function menu.
4. Press Measurement Interval to display the Measurement Interval dialog box.
5. Enter the slot number for analysis, and press **Set** to enter the input value.

■ Setting options

Table 3.7.1-1 Measurement Interval Options

Setting	Settings
Maximum Value	300 slots
Minimum Value	15 slots

3.7.2 Specifying Code Number (Code vs. Time Target Code)

Specify the code power displayed in the Code vs. Time graph results as the SF512-converted code number.

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Code vs. Time** to display the **Code vs. Time** function menu.
3. Press → to display page 2 of the **Code vs. Time** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press Code vs. Time Target Code.
6. Press the numeric keypads and input the code number in the **Code vs. Time Target Code** dialog box.

> ***Note:*** The **Code vs. Time Target Code** dialog box is displayed automatically when the numeric keypads are pressed.

7. Press **Set** to enter the input value.

■ Setting options

Table 3.7.2-1 Code vs. Time Target Code Setting Options

Setting	Settings
Maximum Value	511
Minimum Value	0

3.7.3 Selecting Graph Display (Trace Mode)

This selects a graphical result in the bottom Graph window.

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Code vs. Time** to display the **Code vs. Time** function menu.
3. Press → to display page 2 of the **Code vs. Time** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Trace Mode** to display the **Trace Mode** function menu.
6. Select a graph to be displayed in the bottom Graph window.

■ Setting options

Table 3.7.3-1 Trace Mode Options

Settings	Description
Code Domain Power	Displays code domain power result.
Code Domain Error	Displays code domain error result.

3.7.4 Setting Vertical Scale for Bottom Graph Window (Code vs. Time Scale)

Set the vertical scale for the Code vs. Time graph results displayed in the top graph window.

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press → to display page 2 of the **Measure** function menu.
3. Press **Code vs. Time** to display the **Code vs. Time** function menu.
4. Press → to display page 2 of the **Code vs. Time** function menu.
5. Press **Trace** to display the **Trace** function menu.
6. Press **Scale** to display the **Scale** function menu.
7. Press Code vs. Time Scale to display the Code vs. Time Scale function menu.
8. Select the lower limit of the scale for the Code vs. Time graph results.

■ Setting options

Table 3.7.4-1 Code vs. Time Scale Setting Options

Graph	Settings	Description
Code vs. Time	20 dB, 40 dB 60 dB, 80 dB	Selects scale of a graphical result.

3.7.5 Correcting Vertical Scale for the Upper Graph Window (Code vs Time Scale Offset)

This corrects the vertical scale upper limit for the Code vs. Time graph results displayed in the top graph window.

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Code vs Time** to display the **Code vs Time** function menu.
3. Press → to display page 2 of the **Code vs Time** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Scale** to display the **Scale** function menu.
6. Press **Code vs Time Scale Offset** to display the **Code vs Time Scale Offset** dialog box, and enter the desired parameter.

> ***Note:*** Vertical scale upper limit is calculated as follows:
> Upper limit value [dBm] = Input Level [dBm] + Code vs Time Scale Offset [dB] + 10 [dB] (in 5 dB steps, rounding up fractions less than 5 dB)

■ Setting range

Table 3.7.5-1 Code vs. Time Scale Offset Setting Range

Setting Description	Settings
Maximum value	99.99 dB
Minimum Value	–99.99 dB

3.7.6 Setting Vertical Scale for Bottom Graph Window (Trace Scale)

Set the vertical scale for the code domain power or code domain error graph results displayed in the bottom graph window.
When Code Domain Power is set at Trace Mode, the vertical scale upper limit is fixed at 0 dB. When Code Domain Error is set, the vertical scale lower limit is fixed at –80 dB.

☞ 3.7.3 Selecting Graph Results (Trace Mode)

■ Procedure

1. Press **Measure** on the main function menu to display the **Measure** function menu.
2. Press **Code vs. Time** to display the **Code vs. Time** function menu.
3. Press → to display page 2 of the **Code vs. Time** function menu.
4. Press **Trace** to display the **Trace** function menu.
5. Press **Scale** to display the **Scale** function menu.
6. Press **Trace Scale** to display the ***** Scale** function menu.

> ***Note:*** *** stands for the name of selected mode.

7. Select the maximum/minimum scale value of bottom graph window.

■ Setting options

Table 3.7.6-1 Trace Scale Setting Options

Graph	Settings	Description
Code Domain Power	20 dB, 40 dB 60 dB, 80 dB	Selects scale range in graph. Updates lower limit using setting Maximum fixed at 0 dB
Code Domain Error		Selects scale range in graph. Updates upper limit using setting Minimum is fixed at –80 dB.

3.7.7 Code vs. Time Graph Results

Display the Mean Power and Code Power for the specified code number for up to 10 frame segments.

3.7.2 Specifying Code Number (Code vs. Time Target Code)

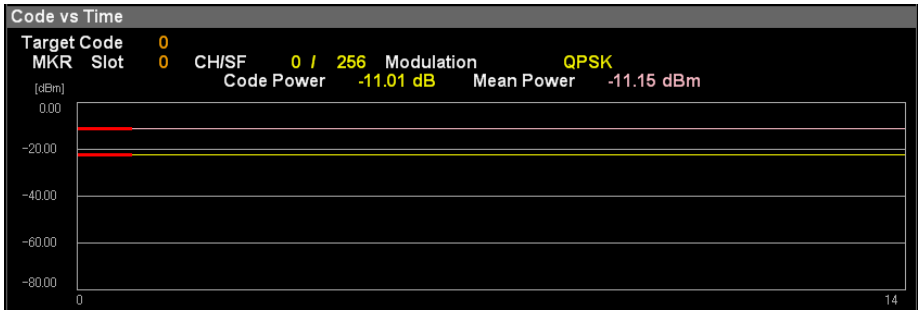

Figure 3.7.7-1 Code vs. Time Display (Active Channel)

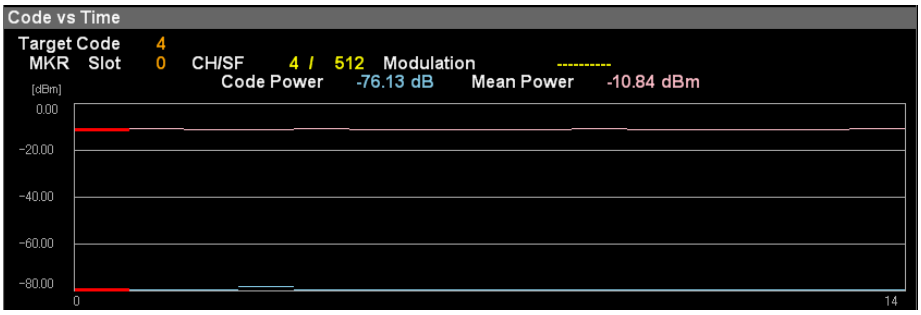

Figure 3.7.7-2 Code vs. Time Display (Inactive Channel)

Table 3.7.7-1 Code vs. Time Measurement Display Contents

Item	Description
Target Code	Displays code number specified by Code vs. Time Target Code
Slot	Displays slot number specified by Code vs. Time Slot Number
CH / SF	Displays channel code number and spreading factor of the code specified with Code vs. Time Target Code.
Modulation	Displays modulation method for code specified by Code vs. Time Target Code
Code Power	Displays code power for slot specified by Code vs. Time Slot Number and for code specified by Code vs. Time Target Code
Mean Power	Displays average power for slot specified by Code vs. Time Slot Number

3.7.8 Code Domain Power and Code Domain Error

Display the code domain power for the slot specified by Code vs. Time Slot Number and the code domain error in the analysis segment (range specified by Measurement Interval) in the bottom graph window. In addition, display the numeric results for the code number specified by Bottom Graph Marker Number in the Result window.

3.7.1 Setting Analysis Time (Measurement Interval)
3.7.2 Specifying Code Number (Code vs. Time Target Code)
3.7.9.3 Setting Target Slot Number (Code vs. Time Slot Number)

3.7.8.1 Numerical Results

Display the numeric results for the slot specified by Code vs. Time Slot Number and for the code number specified by Bottom Graph Marker Number in the analysis segment (specified by Measurement Interval).

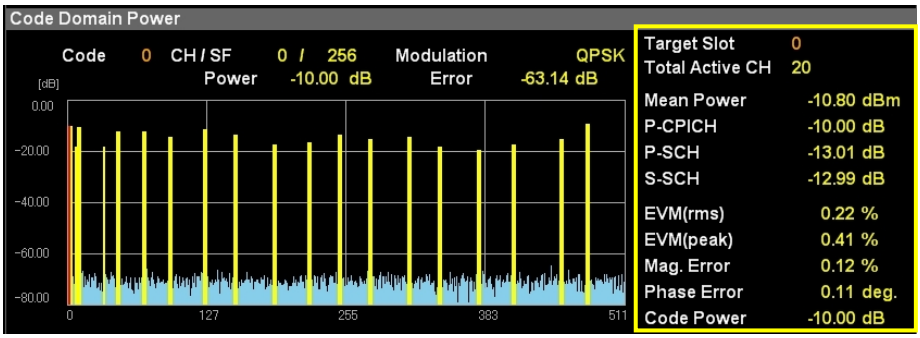

Figure 3.7.8.1-1 Result Window

Table 3.7.8.1-1 Numerical Result Description

Item	Description
Target Slot	Displays slot number specified by Code vs. Time Slot Number
Total Active CH	Displays the number of active channels in the slot specified with Target Slot Number.
Mean Power	Displays average power of slot specified by Code vs. Time Slot Number
P-CPICH	Displays P-CPICH code power for slot specified by Code vs. Time Slot Number
P-SCH	Displays P-SCH code power for slot specified by Code vs. Time Slot Number
S-SCH	Displays S-SCH code power for slot specified by Code vs. Time Slot Number
EVM (rms)	Displays RMS vector error for slot specified by Code vs. Time Slot Number, and for code number specified by Bottom Graph Marker Number

Table 3.7.8.1-1 Numerical Result Description (Continued)

Item	Description
EVM (peak)	Displays max. vector error for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
Mag. Error	Displays RMS amplitude error for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
Phase Error	Displays RMS amplitude error for Phase Error of slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number
Code Power	Displays power for slot specified by Code vs. Time Slot Number and for code number specified by Bottom Graph Marker Number

3.7.8.2 Code Domain Power Graph Results

The code domain power in the slot specified with Code vs. Time Slot Number is displayed in the bottom Graph window. The code power at the marker-selected code is displayed in red.

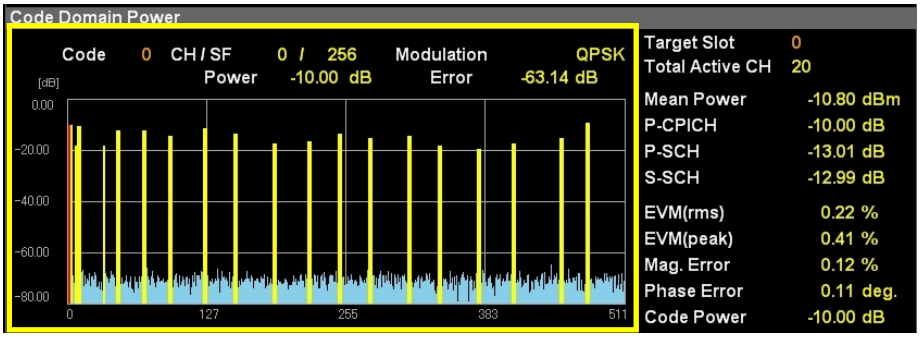

Figure 3.7.8.2-1 Code Domain Power Display

Table 3.7.8.2-1 Code Domain Power Description

Item	Description
Code Number	Displays power for code number specified by Bottom Graph Marker Number
CH / SF	Displays channel code number and spreading factor for code specified by Bottom Graph Marker Number
Modulation	Displays modulation method for code number specified by Bottom Graph Marker Numbers
Power	Displays code power for code number specified by Bottom Graph Marker Number
Error	Displays code error for code number specified by Bottom Graph Marker Number

3.7.8.3 Code Domain Error Graph Results

The code domain error in the slot specified with Code vs. Time Slot Number is displayed in the bottom Graph window. The code error at the marker-selected code is displayed in red.

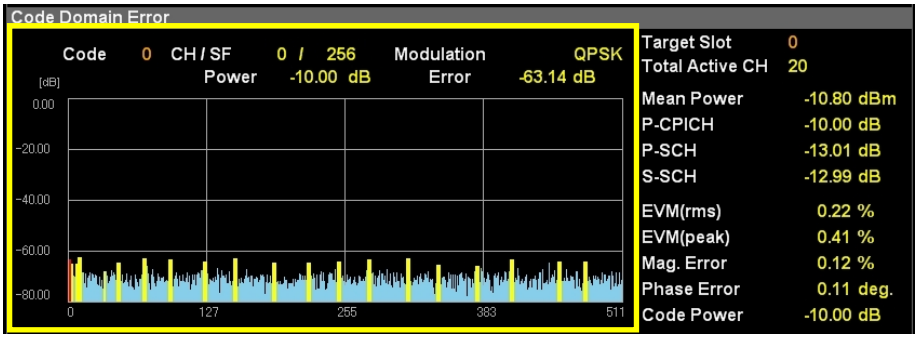

Figure 3.7.8.3-1 Code Domain Error Display

Table 3.7.8.3-1 Code Domain Error Description

Settings	Description
Code Number	Displays error value for code number specified by Bottom Graph Marker Number
CH / SF	Displays channel code number and spreading factor for code number specified by Bottom Graph Marker Number
Modulation	Displays modulation method for code number specified by Bottom Graph Marker Number
Power	Displays code power for code number specified by Bottom Graph Marker Number
Error	Displays code error for code number specified by Bottom Graph Marker Number

3.7.8.4 Linking with Code vs. Time Graph Results (Set Target Code to Marker Code)

Set the marker value set at the bottom graph window (Bottom Graph Marker Number) as the Code vs. Time Target Code of the Code vs. Time graph results. The code domain power or the code domain error graph results and the Code vs. Time graph results are easily checked while linked.

☞ 3.7.9.5 Reflecting Marker Position in Code vs. Time Graph Results (Set Target Code to Marker Code)

3.7.9 Setting Markers (Marker)

3.7.9.1 Enabling/Disabling Markers (Maker)

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Enable or disable by pressing **Marker**.

■ Setting options

Table 3.7.9.1-1 Marker Options

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

3.7.9.2 Selecting Operation Target Graph (Code vs. Time Select/Bottom Graph Select)

Set the target for the rotary knob and cursor key operation. The target is the Code vs. Time graph results or the bottom graph window.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Code vs. Time Select** or **Bottom Graph Select** to select the operation target graph.

■ Setting options

Table 3.7.9.2-1 Operation Target Graph Setting Range

Settings	Description
Code vs. Time Select	Selects Code vs. Time.
Bottom Graph Select	Selects bottom graph window.

3.7.9.3 Setting Target Slot Number (Code vs. Time Slot Number)

Set the code domain power displayed in the bottom graph window or the slot number for the code domain error graph results and the marker position for the Code vs. Time graph results.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press Code vs. Time Select.
3. Press **Code vs. Time Slot Number** and input the slot number for analysis using the numeric keypads at the Code vs. Time Slot Number dialog box.
4. Press **Set** to enter the input value.

■ Setting options

Table 3.7.9.3-1 Code vs. Time Slot Number Setting Range

Setting	Settings
Maximum Value	Measurement Interval – 1 slot ☞ 3.7.1 Setting Analysis Time (Measurement Interval)
Minimum Value	1 slot

3.7.9.4 Setting Marker Position in Bottom Graph Window (Bottom Graph Marker Number)

Set the code domain power displayed at the bottom graph window or the code domain error marker position as the SF512-converted code number.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press **Bottom Graph Marker Number** and input the code number using the numeric keypads at the Bottom Graph Marker Number dialog box.
3. Press **Set** to enter the input value.

■ Setting options

Table 3.7.9.4-1 Bottom Graph Marker Number Setting Range

Setting Description	Settings
Maximum Value	511
Minimum Value	0

3.7.9.5 Reflecting Marker Position in Code vs. Time Graph Results (Set Target Code to Marker Code)

Set the marker value (Bottom Graph Marker Number) set at the bottom graph window at Code vs. Time Target Code of the Code vs. Time graph results. The code domain power or code domain error graph results and Code vs. Time graph results are easily checked while linked.

■ Procedure

1. Press **Marker** on the main function menu to display the **Marker** function menu.
2. Press Set Marker to Target Code.
3. The marker position is reflected in Code vs. Time Target Code.

3.8 Measurement Using SPA/VSA Functions (Measure: ACP, Channel Power, OBW, SEM)

3.8.1 Adjacent Channel Power Measurement (ACP)

Fetch the ACP function of the signal analyzer application or the spectrum analyzer application and measure the adjacent channel leakage power. At actual measurement, the parameters specified at W-CDMA Downlink application are handed over automatically to the target parameters and executed.

> ***Note:*** Adjacent Channel Power (ACP)
> ***Note:*** Signal analyzer or spectrum analyzer must be loaded before measurement.
> ***Note:*** Parameter settings cannot be recalled using the Recall Current application while calling the ACP function from W-CDMA Downlink.

Table 3.8.1-1 Parameter Handover at ACP Measurement

Parameter	References
Carrier Frequency	3.2 Setting Frequency (Carrier Frequency)
Input Level	3.3.1 Setting Input Level (Input Level)
Pre-Amp	3.3.2 Amplifying Input Level (Pre-Amp)
Offset	3.3.3 Correcting Input Level (Offset)
Offset Value	3.3.4 Setting Input Level Correction Offset Value (Offset Value)

3.8.1.1 ACP (FFT)

Set at ACP measurement using FFT.
This is used for ACP measurement when speed is important.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" for details.

4.2.10 Measure

> ***Note:*** When measuring a multicarrier signal, use ACP (Swept). ACP (FFT) cannot be used to measure multicarrier signals because the bandwidth is insufficient.

3.8.1.2 ACP (Swept)

Set at ACP measurement by sweeping.
This is used to obtain more accurate results with a wide dynamic range.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)".

☞ 7.2 Adjacent Channel Power Measurement (ACP)

3.8.2 Channel Power Measurement (Channel Power)

Fetch the Channel Power function of the signal analyzer application or the spectrum analyzer application. The settings of the W-CDMA Downlink application are reflected in the Channel Power function of the signal analyzer or spectrum analyzer application. Measure the channel power.

> ***Note:*** Signal analyzer or spectrum analyzer must be loaded before measurement.
>
> ***Note:*** Parameter settings cannot be recalled using the Recall Current application while calling the Channel Power function from W-CDMA Downlink.

Table 3.8.2-1 Parameter Handover at Channel Power Measurement

Parameter	References
Carrier Frequency	3.2 Setting Frequency (Carrier Frequency)
Input Level	3.3.1 Setting Input Level (Input Level)
Pre-Amp	3.3.2 Amplifying Input Level (Pre-Amp)
Offset	3.3.3 Correcting Input Level (Offset)
Offset Value	3.3.4 Setting Input Level Correction Offset Value (Offset Value)

3.8.2.1 Channel Power (FFT)

Set at Channel Power measurement using FFT.
This is used for Channel Power measurement when speed is important.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" .

4.2.10 Measure

> ***Note:*** When measuring a multicarrier signal, use Channel Power (Swept). Channel Power (FFT) cannot be used to measure multicarrier signals because the bandwidth is insufficient.

3.8.2.2 Channel Power (Swept)

Set at Channel Power measurement by sweeping.
This is used to obtain more accurate results with a wide dynamic range.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)".

7.4 Channel Power Measurement

3.8.3 Occupied Bandwidth Measurement (OBW)

Fetch the OBW function of the signal analyzer application or the spectrum analyzer application and measure the occupied bandwidth for the parameters set at the W-CDMA Downlink application.

> ***Note:*** Occupied BandWidth (OBW)
> ***Note:*** Signal analyzer or spectrum analyzer must be loaded before measurement.
> ***Note:*** Parameter settings cannot be recalled using the Recall Current application while calling the OBW function from W-CDMA Downlink.

Table 3.8.3-1 Parameter Handover at OBW Measurement

Parameter	References
Carrier Frequency	3.2 Setting Frequency (Carrier Frequency)
Input Level	3.3.1 Setting Input Level (Input Level)
Pre-Amp	3.3.2 Amplifying Input Level (Pre-Amp)
Offset	3.3.3 Correcting Input Level (Offset)
Offset Value	3.3.4 Setting Input Level Correction Offset Value (Offset Value)

3.8.3.1 OBW (FFT)

Set at OBW measurement using FFT.
This is used for OBW measurement when speed is important.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Signal Analyzer Function Operation)" .

4.2.10 Measurement

> ***Note:*** When measuring a multicarrier signal, use OBW (Swept). OBW (FFT) cannot be used to measure multicarrier signals because the bandwidth is insufficient.

3.8.3.2 OBW (Swept)

Set at OBW measurement by sweeping.
This is used to obtain more accurate results with a wide dynamic range.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)".

7.5 Occupied Bandwidth Measurement

3.8.4 Spectrum Emission Mask Measurement (SEM)

Fetch the SEM function of the spectrum analyzer application and measure the spectrum emission mask for the parameters set at the W-CDMA Downlink application.

> ***Note:*** Spectrum Emissions Mask (SEM)
> ***Note:*** Spectrum analyzer must be loaded before measurement.
> ***Note:*** Parameter settings cannot be recalled using the Recall Current application while calling the SEM function from W-CDMA Downlink.

Table 3.8.4-1 Parameter Handover at SEM Measurement

Parameter	References
Carrier Frequency	3.2 Setting Frequency (Carrier Frequency)
Input Level	3.3.1 Setting Input Level (Input Level)
Pre-Amp	3.3.2 Amplifying Input Level (Pre-Amp)
Offset	3.3.3 Correcting Input Level (Offset)
Offset Value	3.3.4 Setting Input Level Correction Offset Value (Offset Value)

Set to SEM measurement at sweeping.
Refer to the "MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)" or "MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Spectrum Analyzer Function Operation)".

7.6 Spectrum Emission Mask Measurement (Spectrum Emission Mask)

3.8.5 Advanced settings

This function configures settings related to spectrum measurement.

3.8.3.1 Coupled Ref & ATT in Swept & FFT

When function is switched among each measurement function using Signal Analyzer or Spectrum Analyzer function, this setting sets whether to inherit Reference Level and ATT settings.

■ Procedure

1. Press **Measure** at the main function menu to display **Measure** function menu.
2. In the page 2 of **Measure** function menu, press **Advanced Settings**.
3. Configure **Coupled Ref & ATT in Swept & FFT**.

> ***Note:*** When function is switched among each measurement function using Signal Analyzer or Spectrum Analyzer function, this setting sets whether to inherit Reference Level and ATT settings. The ATT setting may not be inherited when measurement function is switched from Modulation Analysis, Code Domain, Code vs Time using Signal/Spectrum Analyzer application.

3.9 Setting Trigger (Trigger)

3.9.1 Reflecting Trigger Signal in Measurement (Trigger Switch)

This sets the trigger synchronization On/Off.

■ Procedure

1. Call **Trigger** function menu
   Open the function menu as shown below.
   - Press **Trigger** on the main function menu to display the **Trigger** function menu.
   - Press

on the front panel to display the **Measure** function menu.
2. Turn the function On/Off by pressing **Trigger Switch**.

■ Setting options

Table 3.9.1-1 Trigger Switch Options

Settings	Description
On	Measurement starts with trigger signal input.
Off	Normal measurement (not synchronized with trigger)

3.9.2 Selecting Trigger Source (Trigger Source)

This sets the trigger source.

> ***Note:*** **SG Marker can only be set when the Vector Signal Generator Hardware Option is installed.**

■ Procedure

1. Call **Trigger** function menu
   Open the function menu as shown below.
   - Press **Trigger** on the main function menu to display the **Trigger** function menu.
   - Press Trigger/Gate on the front panel to display the **Measure** function menu.
2. Press **Trigger Source** to display the **Trigger Source** function menu.
3. Select the trigger source.
4. When selecting the trigger source, the trigger source selected at the measurement parameters is displayed.

■ Setting options

Table 3.9.2-1 Trigger Source Options

Settings	Description
External*1	Measurement starts with external trigger signal input.
External 2*2	Measurement starts with external trigger 2 signal input.
SG Marker	Measurement starts with at the timing of Vector Signal Generator option.

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

3.9.3 Setting Trigger Edge (Trigger Slope)

■ Procedure

1. Call **Trigger** function menu
   Open the function menu as shown below.
   - Press **Trigger** on the main function menu to display the **Trigger** function menu.
   - Press

on the front panel to display the **Measure** function menu.
2. Switch to Rise or Fall by pressing **Trigger Slope**.

■ Setting options

Table 3.9.3-1 Trigger Slope Options

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

Note: Even if the 3.9.1 Trigger Switch setting is Off, it is switched to On automatically when Trigger Slope is set.

3.9.4 Setting Trigger Delay Time (Trigger Delay)

Set the delay time from the trigger input until capture is started.

■ Procedure

1. Call **Trigger** function menu
   Open the function menu as shown below.
   - Press **Trigger** on the main function menu to display the **Trigger** function menu.
   - Press Trigger/Gate on the front panel to display the **Trigger** function menu.
2. Press **Trigger Delay** to open the **Trigger Delay** dialog box. Open the dialog box as shown below.
3. Input the trigger delay.
4. Press the units button **s, ms, μs, or ns** for the trigger delay and **Set** to set the input value.
5. When setting the trigger delay, the trigger delay input at the measurement parameters is displayed.

■ Setting options

Table 3.9.4-1 Trigger Delay Options

Setting	Settings
Maximum Value	+2 s
Minimum Value	–2 s

Chapter 4 Performance Test

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

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

4.1 Overview of Performance Test

4.1.1 Performance Test

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

Use performance tests when required for acceptance inspection, routine inspection and performance verification after repairs. Use performance tests when necessary for acceptance inspection, routine inspection and performance verification after repairs. Perform the following tests at acceptance inspection, routine inspection, and performance inspection after repairs.

- Carrier frequency accuracy
- Residual EVM

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

If items that do not meet the required level are detected during performance testing, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

4.2 Performance Test Items

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

4.2.1 Testing Methods

■ Test target standards

- Carrier frequency accuracy
- Residual EVM

■ Measuring instrument for tests

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

■ Setup

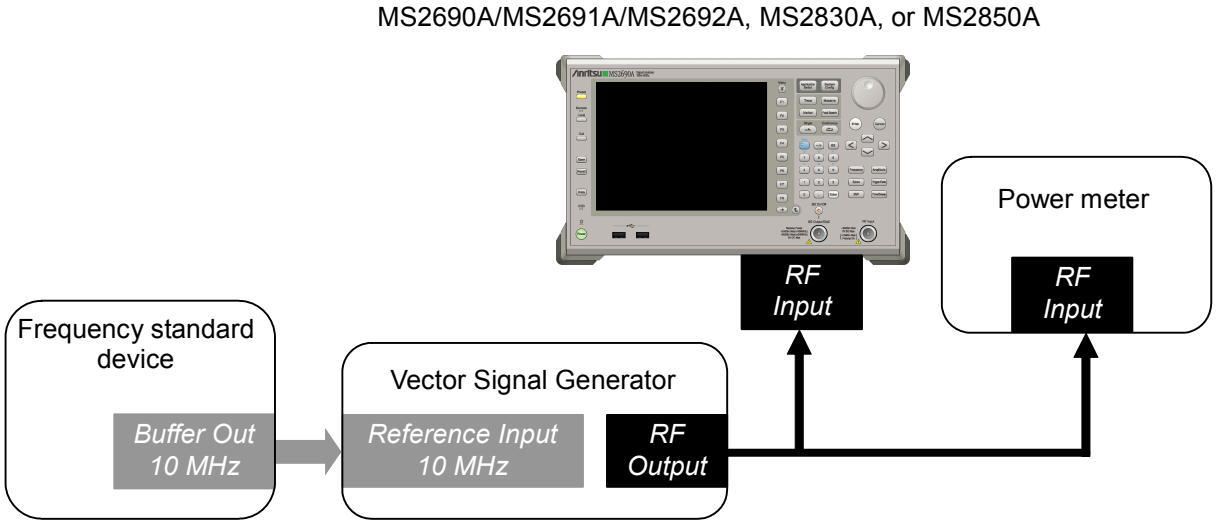

Figure 4.2.1-1 Performance test

■ Test Procedure

(a) Signal source adjustment

1. Input the 10 MHz reference signal output from the frequency standard device into the Reference Input connector of the vector signal generator.
2. Input the 10 MHz reference signal output from the signal generator to the Reference Input connector.
3. Output a W-CDMA downlink signal with Test Model4 from the vector signal generator.
4. Input the vector signal generator output signal into the power meter and measure the power.

(b) Setting up the main unit

1. Turn on the power switch on the front panel and then wait until the internal temperature stabilizes (approximately 1.5 hours after the temperature in the thermostatic bath stabilizes).
2. Press Application Switch to display the Application Switch menu. Press the function key that corresponds to **W-CDMA Downlink**.
3. Press Preset to display the Preset menu.
4. Press **Preset** to return the parameter settings to defaults.
5. Press Cal to display Cal function menu.
6. Press **SIGANA All** to calibrate.
7. Press **Close** to return to function menu.
8. Press Frequency, enter the frequency output by the vector signal generator using the numeric keypad, then press Enter.
9. Press Amplitude, enter the power meter measurement result using the numeric keypad, then press Enter.
10. Press Menu, and then press **Common Setting** to display the Common Setting function menu.
11. Press **Channel Detection**, and then select **Test Model4**.
12. Press Trace on the front panel to display the Trace function menu.
13. Press **Storage** > **Mode** to display the **Storage mode** dialog box.

14. Select **Average** with the cursor or the rotary knob, and press Enter.
15. Press **Count** to display the **Storage Count** dialog box.
16. Enter the measurement count using the numeric keypad, and press Enter.
17. Press Single to perform measurement.

    When measuring the carrier frequency accuracy, select **Auto** for **Reference Signal**. When measuring the residual vector error, select **Fixed to Internal**. Press System Config (System Settings) after pressing F3 to display the System Settings screen. Select and set Reference Signal with cursor key, and then press F7 (Set).
18. Confirm whether the measured **Frequency Error** (carrier frequency accuracy) is within the specifications.
19. Confirm whether the measured **EVM (rms)** (residual vector error) value is within specifications.

(C) Test results

Table 4.2.1-1 Carrier frequency accuracy

Frequency	Min. limit	Deviation (Hz)	Max. limit	Uncertainty	Pass/Fail
400 MHz	MS269xA –5 Hz		MS269xA +5 Hz	MS269xA ±1 Hz	
2140 MHz	MS2830A –6 Hz		MS2830A +6 Hz	MS2830A ±0.7 Hz	
3000 MHz	MS2850A –6 Hz		MS2850A +6 Hz	MS2850A ±0.7 Hz	

Table 4.2.1-2 Residual vector error

Frequency	Measured value [% (rms)]	Max. limit	Uncertainty	Pass/Fail
400 MHz		MS269xA 1.0% (rms)	MS269xA 0.1% (rms)	
2140 MHz		MS2830A 1.3% (rms)	MS2830A 0.1% (rms)	
3000 MHz		MS2850A 1.3% (rms)	MS2850A 0.1% (rms)	

Chapter 5 Other Functions

This chapter describes other functions of this application.

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

5.1 Selecting Other Functions

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

Table 5.1-1 Accessory function menu

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

5.2 Setting Title

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

<Procedure>

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

5.3 Erasing Warmup Message

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

<Procedure>

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

Appendix A Error Messages

Table A-1 Error Messages

Message	Description
Out of range.	–
Not available in Constellation Select.	–
Not available in Bottom Graph Select.	–
Not available in Code vs Time Select.	This operation is disabled when Code vs Time Graph is selected.
Not available in Summary Trace.	–
Available in Summary Trace.	–
Not available when Scrambling Code Synchronization is SCH.	This operation is disabled when SCH is selected at Scrambling Code Synchronization.
Not available when Frame Sync Code Type is P-CPICH.	This operation is disabled when P-CPICH is selected at Frame Sync Code Type.
Not available when Channel Detection is not Auto.	This operation is disabled when Channel Detection is not Auto.
Please load Signal Analyzer.	–
Please load Spectrum Analyzer.	–
No file to read.	–
File read error.	–
File format error.	–
Cannot find device.	–
Invalid character	–

Appendix B Default Value List

List of common parameters

Frequency	
Carrier Frequency	2110 MHz
Amplitude	
Input Level	–10.00 dBm
Level Offset On/Off	Off
Level Offset Value	0.00 dB
Pre-Amp	Off
Trigger	
Trigger Switch	Off
Trigger Source	External
Trigger Slope	Rise
Trigger Delay	0 s

W-CDMA/HSPA Basic Parameter

Common Setting	
Scrambling Code Synchronization	SCH
Scrambling Code	0
Frame Sync Code Type	P-CPICH
Frame Sync Spreading Factor	256
Frame Sync Code Number	0
Channel Detection	Auto
Origin Offset	Incl.
Active Code Threshold	–30.0 dB
PICH CH Number	16
SCH Interference of Relative CDE	Excl.
Peak Relative CDE Detection Mode	Slot

Modulation Analysis

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

Code Domain

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

Code vs Time

Measurement Interval	15 slot
Trace Mode	Code Domain Power
Scale	
Code vs Time	80 dB
Trace Scale	80 dB
Code vs Time Scale Offset.	0 dB
Code vs Time Target Code	0
Marker	
Marker	On
Code vs Time Slot Number	0 Slot
Bottom Graph Marker Number	0 Code

Accessory

Accessory	
Title	On
Title Entry	W-CDMA/HSPA Downlink

References are to section numbers.

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