ADVANTEST

ADVANTEST CORPORATION

R3681 Series OPT50

3GPP Modulation Analysis Software

User's Guide

MANUAL NUMBER FOE-8440149F00

Applicable Models
R3681
R3671

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LIST OF TABLES

1. INTRODUCTION

This chapter describes the outline of this manual and the product overview of the R3681 series signal analyzer option 50 3GPP Modulation Analysis.

1.1 Outline of This Manual

The outline of each chapter is shown below:

For basic operating methods, functions and the remote programming method of the signal analyzer, refer to "1.3 Other Manuals Relating to This Instrument."

Chapter 1. INTRODUCTION	Describes the outline of this manual and the product overview.
Chapter 2. BEFORE OPERATING	Provides preliminary tips on using this instrument. Read this chapter before using this instrument.
Chapter 3. SETUP	Describes how to set up this instrument. After installing this instrument in position, switch it on to make sure that it starts successfully.
Chapter 4. MEASUREMENT EXAMPLES(Downlink)	Describes example measurements(Downlink).
Chapter 5. MENU MAP, FUNCTIONAL EXPLANATION(Downlink)	Describes the menu configuration and functions of the soft keys(Downlink).
Chapter 6. SCPI COMMAND REFERENCE(Downlink)	SCPI command reference(Downlink). The command reference describes the commands in order of function. The following items are described: • Command format • Function description • Parameters • Query response
Chapter 7. PERFORMANCE VERIFICATION(Downlink)	Describes the performance verification test procedures for option 50(Downlink).
Chapter 8. SPECIFICATIONS(Downlink)	Shows the specifications of option 50(Downlink).
Chapter 9. MEASUREMENT EXAMPLES(Uplink)	Describes example measurements(Uplink).
Chapter 10. MENU MAP, FUNCTIONAL EXPLANATION(Uplink)	Describes the menu configuration and functions of the soft keys(Uplink).
Chapter 11. SCPI COMMAND REFERENCE(Uplink)	SCPI command reference(Uplink). The command reference describes the commands in order of function. The following items are described: • Command format • Function description • Parameters • Query response

Chapter 12. PERFORMANCE VERIFICATION (Uplink)	Describes the performance verification test procedures for option 50(Uplink).
Chapter 13. SPECIFICATIONS (Uplink)	Shows the specifications of option 50(Uplink).
APPENDIX	Describes operation principles and the error code table.

1.2 Product Overview

The 3GPP modulation analysis option is software that conducts the modulation analysis of the 3GPP signal.

This option has the following features.

- In the multi-carrier mode, the 4 carrier multiplex 3GPP Base Station signal is analyzed for each carrier and the numerical results such as Error Vector Magnitude can be displayed the four carriers at the same time.
- In the code domain mode, up to 4 frames for each slot are analyzed for the specified carrier and the numerical results such as Error Vector Magnitude and the graphs such as Code Domain Power can be displayed. The multiple measurement result windows can be evaluated at the same time because up to four result windows can be displayed.
- In the Concise Mode, numerical results such as Error Vector Magnitude can be displayed for the 3GPP Mobile Station signal.

1.3 Other Manuals Relating to This Instrument

Manuals which relate to this instrument include:

- User's Guide (Part Code: {ER3681SERIES/U}, English)

  Describes how to setup the R3681 Series Signal Analyzer, how to perform procedures such as, basic operations, applied measurements, and maintenance, and describes the functions, specifications of the R3681 Series Signal Analyzer.
- Programming Guide (Part Code: {ER3681SERIES/P}, English)

  Describes how to program the R3681 Series Signal Analyzer to automate measurement sequences and includes a remote control overview, SCPI command references, and sample application programs.
- Performance Test Guide (Part Code: {ER3681SERIES/T}, English)

  Describes how to check the performance of the R3681 Series Signal Analyzer and includes performance test procedures and specifications of the R3681 Series Signal Analyzer.

1.4 Conventions of Notation Used in This Document

In this document, hard keys, touch-screen buttons and menus are represented by the following symbols:

Hard keys
"Hard keys" are hardware keys which are on the panel.

Sample	Indicates a hard key labeled "Sample."
	Example: **START**, **STOP**

Touch-screen system menus

[Sample]	Indicates a touch-screen menu, tab, button or dialog box that is labeled "Sample" and that is selected or executed when touched.
	Example: **[File]** menu, **[Normal]** tab, **[Option]** button

Touch-screen function buttons

{Sample}	Indicates a touch-screen button labeled "Sample."
	Example: **{FREQ}** button, **{SWEEP}** button

Touch-screen side menu

Sample	Indicates a touch-screen side menu labeled "Sample."
	Example: **Center** key, **Span** key

Touch-screen system menu key operation

[File]→[Save As...]	Indicates that you need to touch the **[File]** menu and then select **[Save As...]**.

Sequential key operation

{FREQ}, **Center**	Indicates that you need to touch the **{FREQ}** button and then touch the **Center** key.

Toggle key operation

ΔMarker On/Off (On)	Indicates that you need to touch the **ΔMarker On/Off** key to turn on the ΔMarker.

*NOTE: **Screen displays and diagrams such as external view of the main unit in this manual are those of the R3681 in the R3681 series.***

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2. BEFORE OPERATING

This chapter describes important information on using this instrument. Read this chapter before using this instrument.

2.1 If a Fault Should Occur

If smoke, strange smells, or strange noises are detected, switch off the power, disconnect the power cable and contact either your dealer or Advantest immediately.

2.2 Removing the Case

The case should not be opened except by qualified Advantest service personnel.

WARNING: ***This instrument contains high-voltage and high-temperature parts. Electrical shocks or burns may result if handled incorrectly.***

2.3 Overcurrent Protection

This instrument is protected from overcurrent flow by a power breaker. Located on the rear panel, the power breaker automatically interrupts the power supply when an overcurrent flows through this instrument. When the power breaker has turned off, turn off the power supply and disconnect the power cable from the AC power. Then, call upon your dealer or us for repair services to fix a possible fault that has occurred in this instrument.

2.4 Hard Disk Drive

This instrument has a built-in hard disk drive. When handling the hard disk drive, take notice of these instructions.

- Do not cause impact or vibration damage to the hard disk drive.
  Damaging the disk increasing the chances of the disk malfunctioning or failing during operation.
- Do not switch off this instrument while the HDD access lamp is lit.
  The data being accessed may become corrupt.

CAUTION: ***We do not assume any responsibility for the loss or corruption of data stored on the hard disk drive that might result from the disk becoming damaged.***

2.5 Handling the Touch Screen

This instrument has a touch screen. When handling the touch screen, take notice of these instructions.

- Do not give apply excessive force to the screen. The screen is made from glass and may crack.
- Use the stylus pen included with this instrument to operate the screen. Using a tool with a hard-point (such as a mechanical pencil or ballpoint) may scratch the screen surface.

2.6 Getting the Software Running with Stability

The R3681 Series Signal Analyzer has Microsoft Windows XP pre-installed.

The measuring function of this instrument is dependent on the Windows environment. Do not alter the Windows operating environment in any way other than as described in this manual.
This instrument is not a data processor. Operate it only as described in this manual.

1. Prohibited actions
   - Installing other application programs.
   - Changing or deleting items in the control panel (except as described in "A.2 Installing the Printer Driver" and "A.3 Setting up the Network" of R3681 Series User's Guide).
   - Creating new files or editing existing files on the C drive.
   - Operating other application programs during the measurement.
   - Upgrading the Windows operating system.
   - If this instrument functions incorrectly because of any of the above, re-install the system using the system recovery disk.
     For more information on the system recovery procedure, refer to section 8.7, "System Recovery Procedure" in the R3681 Series User's Guide.
2. Computer viruses

   Depending on the operating environment, the system may become infected by a computer virus. To protect the system, we recommended taking the following countermeasures:
   - Perform a virus check before loading any file or inserting any media from an outside source.
   - Make sure that any network used has safety measures against computer viruses before connecting this instrument.

   [If infected with a computer virus:]
   - Delete all files on the D drive. Re-install the system using the recovery disk.
     For more information on the system recovery procedure, refer to section 8.7, "System Recovery Procedure" of R3681 Series User's Guide.

2.7 Transporting

Extreme care as described below must be taken when carrying this instrument.

- This instrument is heavy and must be carried by two or more persons, or on a transportation cart.
- If using a cart to move this instrument, ensure the instrument is secure.

2.8 Electromagnetic Interference

This instrument may cause electromagnetic interference and affect television and radio reception.
If the electromagnetic interference is reduced when this instrument's is turned off, then this instrument is the cause of the problem.
Electromagnetic interference may be prevented by doing the following:

- Changing the direction of the antenna of the television or radio.
- Placing this instrument on the other side of the television or radio.
- Placing this instrument away from the television or radio.
- Using different lines power outlets for this instrument and the television or radio.

2.9 Before Turning On

Do not connect a DUT to this instrument when turning on.

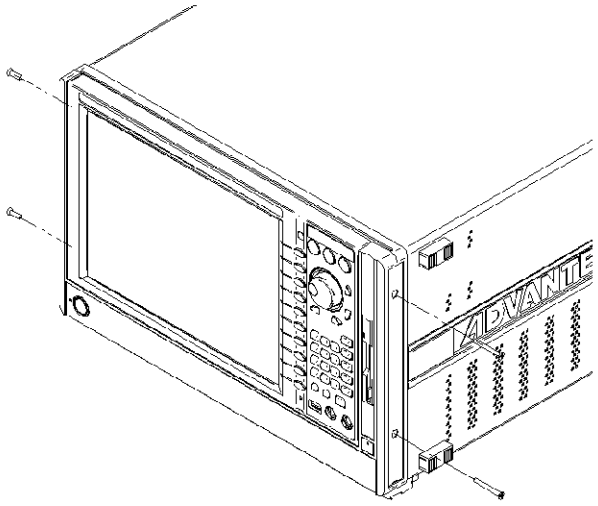
2.10 Removing and Attaching the Front Panel

This instrument can be used separately after removing the panel.
When removing the panel, take notice of these instructions.

MEMO: ***To use this instrument after removing the panel, a connecting cable is required (sold separately).***

- If this instrument's power is turned on, make sure that this instrument has stopped operating, turn off the power, and remove the power cable.
- When removing or attaching the panel, take care not to catch your fingers.
- Place this instrument on a flat and steady table when removing or attaching the panel.
- Remove the four screws that are exposed on the side of the front panel of this instrument.
- When removing the screws, steady the panel so that it will not fall.
- After all four screws have been removed, pull the panel forward.
- Remove the cable connecting the panel to the instrument.
- Replace the cable with an appropriate cable.
- If any screws become lost, use the following types of screw.
  - For the 2 screws on the key side: flat-head Phillips screws M4X35 (steel or stainless steel)
  - For the 2 screws on the liquid-crystal display: flat-head Phillips screws M4X14 (steel or stainless steel)

2.10 Removing and Attaching the Front Panel



2.11 Limitations Imposed when Using Windows XP

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3. SETUP

This chapter describes how to set up this instrument. Topics included in this chapter are:

3.1 Unpacking Inspection

When the product is delivered, check the condition of it and its accessories included by following these steps:

1. Check that the box and the padding in which the product was shipped has not been damaged during transit.

   IMPORTANT: ***If the box or the padding is damaged, leave them in their original condition until the inspection described below is complete.***

2. Check the product surfaces for any damage.

   WARNING: ***Do not supply any power to this instrument if the cover, panels (front and rear), LCD display, power switch, connector or any other key component are damaged. Electrical shocks may result from using damaged components.***

3. Referring to the standard accessory list of the OPT50 in Table 3-1, check that all standard accessories have been supplied and that no accessories are damaged.

   Contact your dealer or Advantest in any of the following situations:

   - The box or the padding in which the product was shipped was damaged during transit.
   - The product surfaces are damaged.
   - Any of the standard accessories are missing or damaged.
   - Faults are detected in any subsequent product verification test.

Table 3-1 Standard Accessories

Name	Model	Quantity	Remarks
R3681 Series OPT50 User's Guide	ER3681OPT50	1	English version

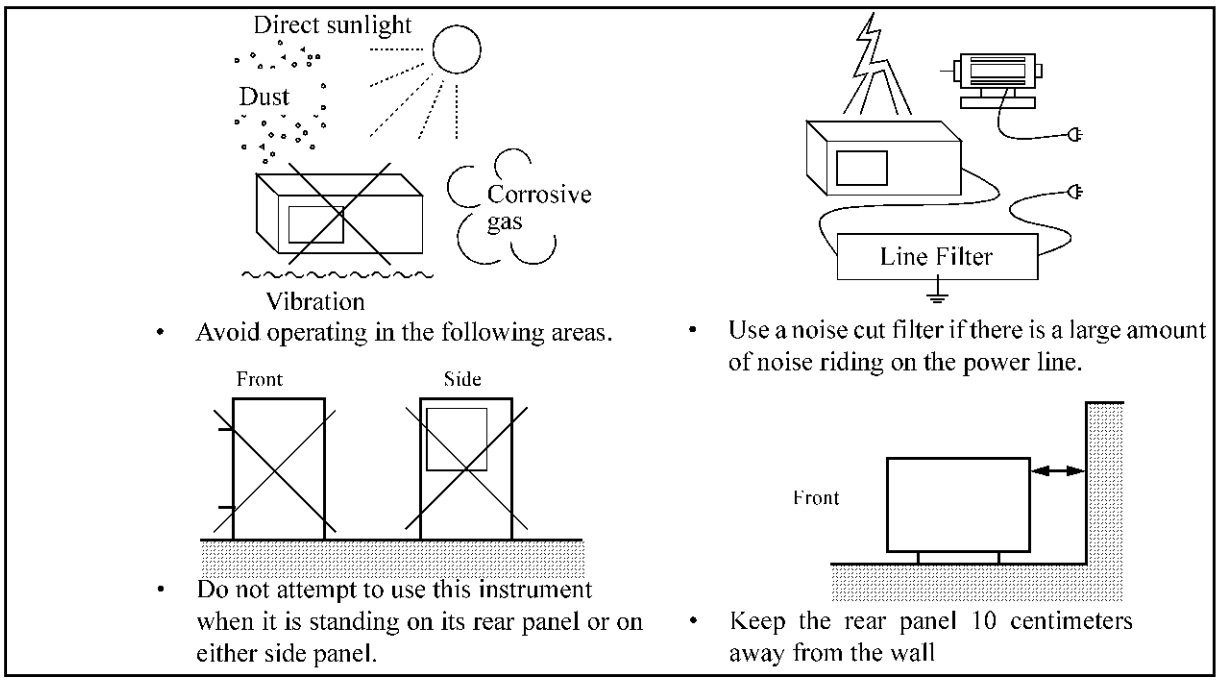
3.2 Locating This Instrument

This section describes the environment in which this instrument should be installed.

3.2.1 Operating Environment

This instrument should only be used in an environment that satisfies the following conditions:

- Ambient temperature: +5 °C to +40 °C (operating temperature)
  -20 °C to +60 °C (Storage temperature range)
- Relative humidity: RH80% or less (no condensation)
- An area free from corrosive gas
- An area away from direct sunlight
- A area free from dust
- An area free from vibrations
- A low noise area
  Although this instrument has been designed to withstand a certain amount of noise riding on the AC power line, it should be used in an area of low noise. Use a noise filter if ambient noise is unavoidable.
- An area allowing unobstructed airflow
  There is an exhaust-cooling fan on the rear panel and exhaust vents on both sides and the bottom (toward the front) of this instrument. Do not block these vents. The resulting internal temperature rise will affect measurement accuracy. Keep the rear panel 10 centimeters away from the wall. In addition, do not attempt to use this instrument when it is standing on its rear panel or lying on either side.



- Avoid operating in the following areas.
- Use a noise cut filter if there is a large amount of noise riding on the power line.
- Do not attempt to use this instrument when it is standing on its rear panel or on either side panel.
- Keep the rear panel 10 centimeters away from the wall

Figure 3-1 Operating Environment

3.2.2 Prevention of Electrostatic Buildup

To prevent electrostatic discharge (ESD) from damaging components in this instrument, the precautions described below should be taken. We recommend that two or more countermeasures are combined to provide adequate protection from ESD.
(Static electricity can easily be generated when a person moves or an insulator is rubbed.)

Table 3-2 ESD Countermeasures

Operator	Use a wrist strap (see Figure 3-2).
Floor in the work area	Install a conductive mat, use conductive shoes, and connect both to ground (see Figure 3-3).
Workbench	Install a conductive mat and connect it to ground (see Figure 3-4).

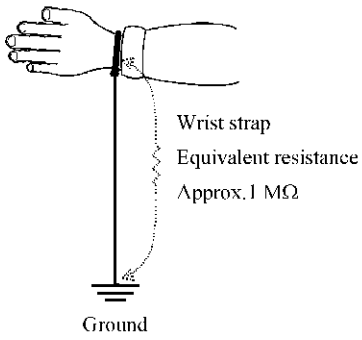


Figure 3-2 Countermeasures against Static Electricity from the Human Body

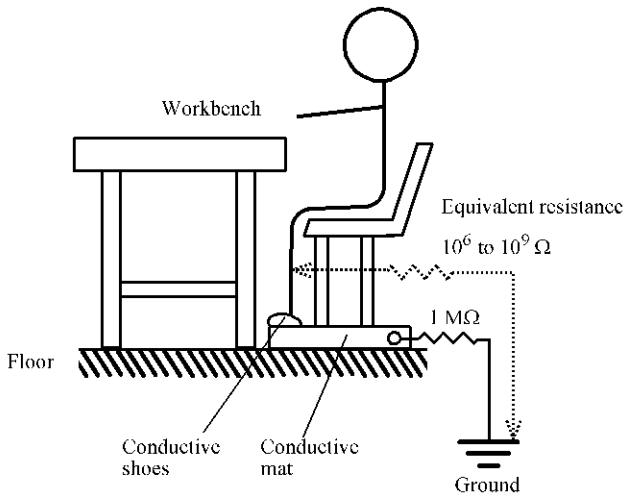


Figure 3-3 Countermeasures against Static Electricity from the Work Floor

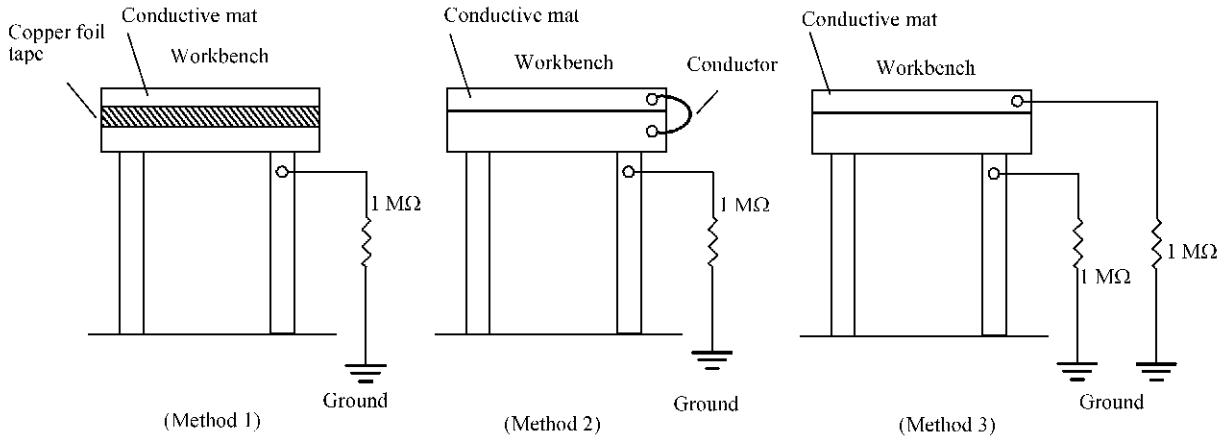


Figure 3-4 Countermeasures against Static Electricity from the Workbench

3.3 Connecting Accessories

This section describes how to connect accessories to this instrument and run it.

3.3.1 Connecting the Keyboard and Mouse

Plug the keyboard and mouse into their respective front-panel connectors before turning on this instrument.

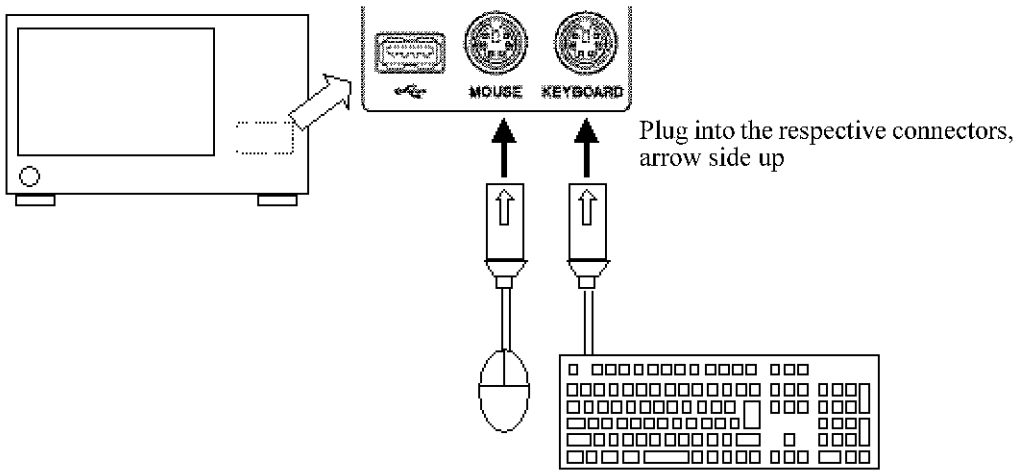


Figure 3-5 Connecting the Keyboard and Mouse

3.4 Supply Description

This section describes how to check the power supply specifications and connect the power cable.

3.4.1 Check the Supply Power

Table 3-3 summarizes the power supply specifications for this instrument. Make sure that the power supply available to this instrument meets these specifications.

Table 3-3 Power Supply Specifications

	100 V AC Operation	200 V AC Operation	Remarks
Input voltage range	90 V to 132 V	198 V to 250 V	Automatically switches between input levels of 100 V AC and 200 V AC.
Frequency range	47 Hz to 63 Hz		
Power consumption	450 VA or below		

WARNING: ***Be sure to provide a power supply that meets the specified power supply specifications for this instrument. Failure to meet the specifications could cause damage to this instrument.***

3.4.2 Connecting the Power Cable

This instrument comes with a three-core power cable with a ground conductor. To prevent electrical shock hazards, ground this instrument by plugging the power cable into a three-pole power outlet.

1. Check the power cable included with this instrument for any damage.

   WARNING: ***Never use a damaged power cable. Electrical shock could result.***

2. Plug one end of the power cable included with this instrument into the AC power connector on this instrument rear panel and the other into a three-pin power outlet that has a ground pin (see Figure 3-6).

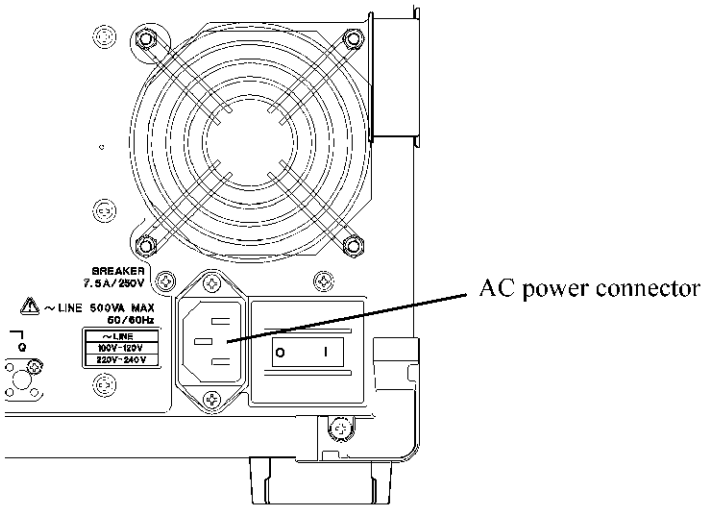


Figure 3-6 Connecting the Power Cable

WARNING:

1. ***Use a power cable rated for the voltage being used. Be sure, however, to use a power cable that conforms to the safety standards of your country when using this instrument (Refer to "Safety Summary").***
2. ***Plug the power cable into a three-pin power outlet that has a ground pin to prevent electrical shocks. Using an extension cable that has no ground pin would negate having a ground.***

3.5 Operation Check

This section describes how to make a simple operation check on this instrument by using its built-in autocalibration feature. To verify that this instrument runs correctly, follow these steps:

Starting up this instrument

1. Connect the power cable as instructed in 3.4.2 "Connecting the Power Cable."
2. Switch on the power breaker on the rear panel and wait for 3 seconds or more.
3. Press the **POWER** switch to switch on the power.

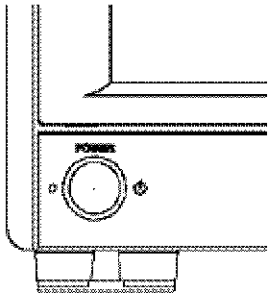


Figure 3-7 **POWER** Switch

CAUTION:

1. ***If the power to this instrument is suddenly interrupted while the unit is in operation, such as is the power cable is disconnected, the hard disk drive could be damaged. Even if the hard disk drive does not fail, Scandisk launches to check for possible data corruption the next time this instrument starts up.***
2. ***About Scandisk***
   If this instrument has been switched off without being shut down, Scandisk will automatically launch to check for any corrupt data. Do not abort Scandisk while it is running. If Scandisk locates any corrupt data, take appropriate action by following the displayed messages. The software in this instrument resumes automatically when Scandisk ends.

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4. The power-on diagnostic program launches to carry out self-diagnostics.
   The self-diagnostic program take about 1 minute to complete.
5. The initial screen shown in Figure 3-8 is displayed unless this instrument is faulty. The initial screen may give look differently from Figure 3-8, depending on the settings in effect the last time this instrument was switched off.

NOTE: ***Refer to Chapter 8, "MAINTENANCE" of R3681 Series User's Guide if any error messages are displayed as a result of the self-diagnostic program.***

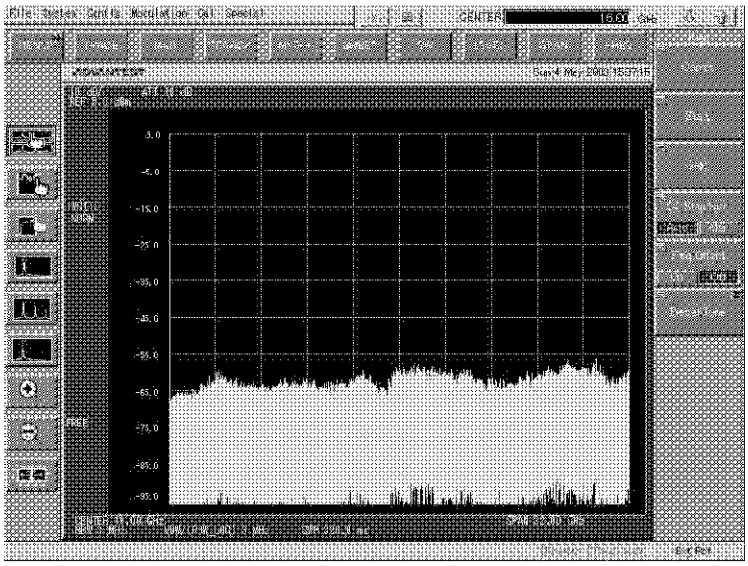


Figure 3-8 Initial Setup Screen

Running autocalibration

6. <R3681>
Install this instrument as shown in Figure 3-9 by using the SMA (f)-SMA (f) adapter, SMA (m)-BNC (f) adapter, and input cable (A01261-30) that come with this instrument as standard.

<R3671>
Hook up this instrument as shown in Figure 3-9 by using the N (m)-BNC (f) adapter, and input cable (A01261-30) that come with this instrument as standard.

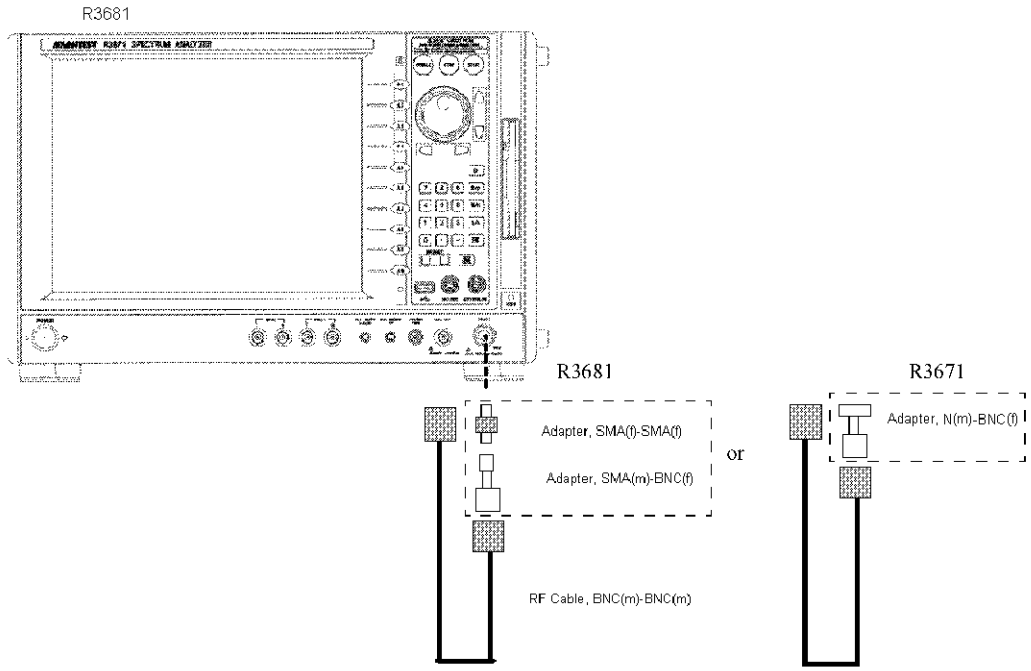


Figure 3-9 Autocalibration

IMPORTANT: ***Allow this instrument to warm up for at least 30 minutes before running the autocalibration. For more information on how to use the autocalibration, refer to Section 4.3.1, "Autocalibration" of the R3681 Series User's Guide.***

---

7. Touch the **|Cal|** button on this instrument's menu bar to select **|SA Cal|** from the dropdown menu.
8. Autocalibration runs.
   The autocalibration takes about 1 minute to complete.
9. Make sure that no error messages are displayed as a result of the autocalibration.

MEMO: ***Refer to Chapter 8, "MAINTENANCE" of the R3681 Series User's Guide if error messages are displayed as a result of the autocalibration.***

Switching off power

Press **POWER** to switch off this instrument.
The final procedure is complete and the power is automatically turned off.

4. MEASUREMENT EXAMPLES(Downlink)

This chapter describes how to use this option by using specific measurement examples.

4.1 3GPP Base Station Signal Measurement

Signal Specifications

The target signal is the signal in the 3GPP system test unit and the channel, which is complied with 3GPP Standard TS.25.141V5.7.0, is output with the following specifications.

Table 4-1 Signal Specifications

Carrier	1	2	3	4
Carrier frequency	1995 MHz	2000 MHz	2005 MHz	2010 MHz
Level	-10 dBm	-10 dBm	-10 dBm	-10 dBm
Scrambling Code No.	0	16	32	48
Active channel	TestModel1 DPCH64codes	TestModel1 DPCH64codes	TestModel1 DPCH64codes	TestModel1 DPCH64codes

4.1.1 3GPP Base Station Signal Measurements Using the Concise Mode

The Error Vector Magnitude etc. of each carrier for the 4-carrier multiplex signal can be measured by using the Concise Mode. An example of the 4-carrier Error Vector Magnitude measurement is shown below.

Connection

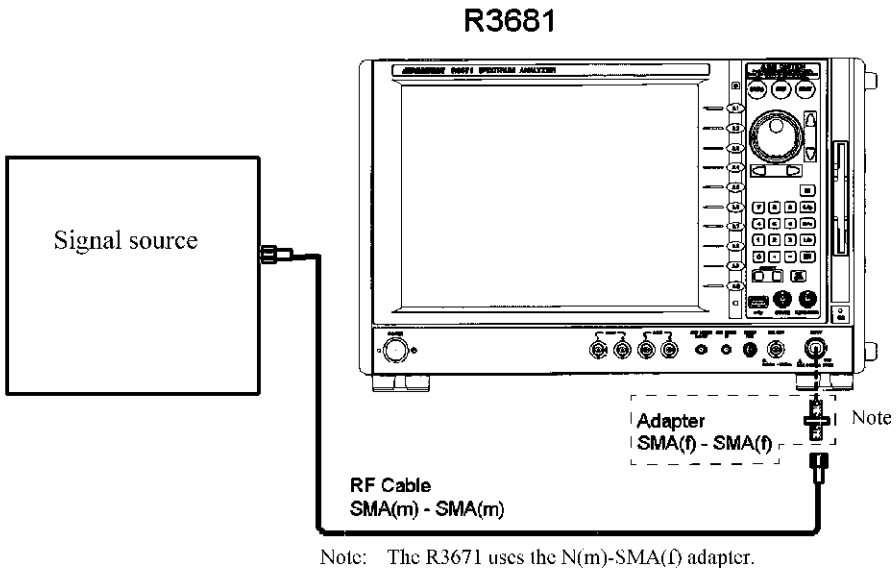


Figure 4-1 Connection Diagram Using the Concise Mode

Measurement condition setting

1. Touch **[Config]** on the menu bar and select **[Modulation Analyzer]**.
2. Touch **|Modulation|** on the menu bar and select **[3GPP DL|**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **2** and **G/p** on the keypad.
   The center frequency is set to 2 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.
10. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
11. Set the **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.

12. Touch the close button [×] in the **[Input Setup]** dialog box to close the dialog box.

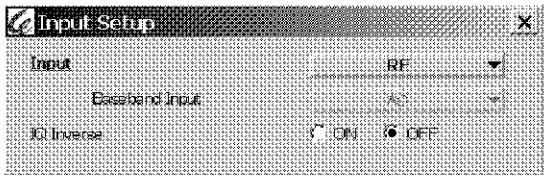


Figure 4-2 **[Input Setup]** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **Concise** key on the soft menu bar.
    The Measurement mode is set to the Concise mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.
19. Set the **[Meas Band Width]** option button to **[Multi Carrier]**.
    The measurable bandwidth is set to the width of four carriers.
20. Touch the **[Multi Carrier Number]** text box and press **4** and **ENT** on the keypad.
    The number of carriers to be measured is set to 4.
21. Set the **[Setup Carrier]** option button to **[1st Carrier]**.
    The measurement conditions can be set for the first carrier.
22. Touch the **[Carrier Frequency Offset]** text box and press **0** and **ENT** on the keypad.
    The offset frequency from the center frequency is set to 0 Hz.
23. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.
24. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.
25. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.

26. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.

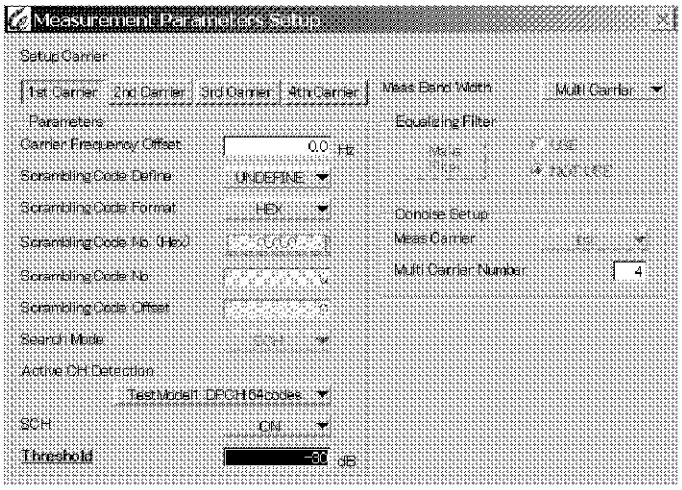


Figure 4-3 **[Measurement Parameters Setup]** Dialog Box

27. Set the **[Setup Carrier]** option button to **[2nd Carrier]**.
    The measurement conditions can be set for the second carrier.

28. Touch the **[Carrier Frequency Offset]** text box and press [-], [5] and [M/n] on the keypad.
    The offset frequency from the center frequency is set to -5 MHz.

29. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.

30. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.

31. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.

32. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.

33. Set the **[Setup Carrier]** option button to **[3rd Carrier]**.
    The measurement conditions can be set for the third carrier.

34. Touch the **[Carrier Frequency Offset]** text box and press [5] and [M/n] on the keypad.
    The offset frequency from the center frequency is set to 5 MHz.

35. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.

36. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.
37. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.
38. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.
39. Set the **[Setup Carrier]** option button to **[4th Carrier]**.
    The measurement conditions can be set for the fourth carrier.
40. Touch the **[Carrier Frequency Offset]** text box and press [1], [0] and [M/n] on the keypad.
    The offset frequency from the center frequency is set to 10 MHz.
41. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.
42. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.
43. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.
44. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.
45. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.
46. Push the [SINGLE] button on the front panel.
    The Single measurement is executed, and the measurement results are displayed.

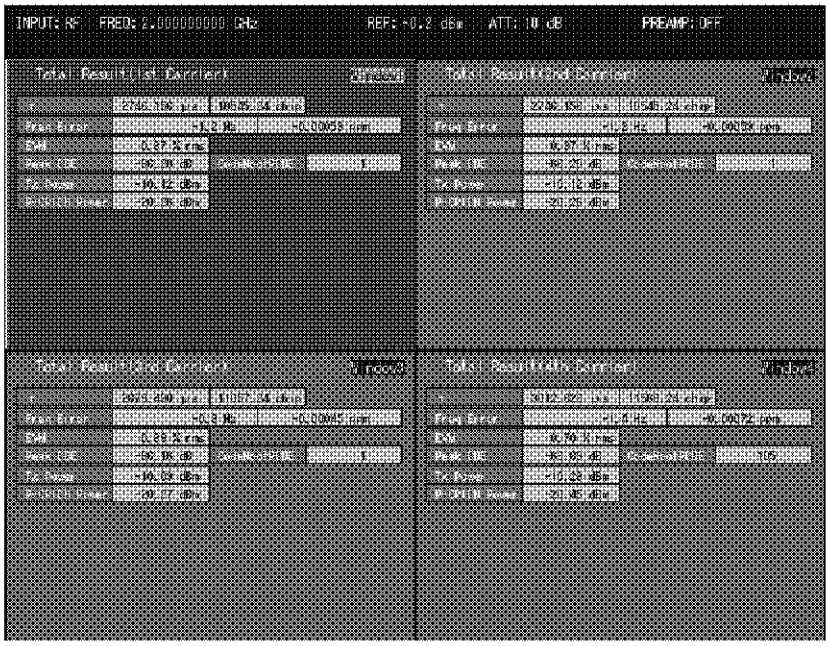


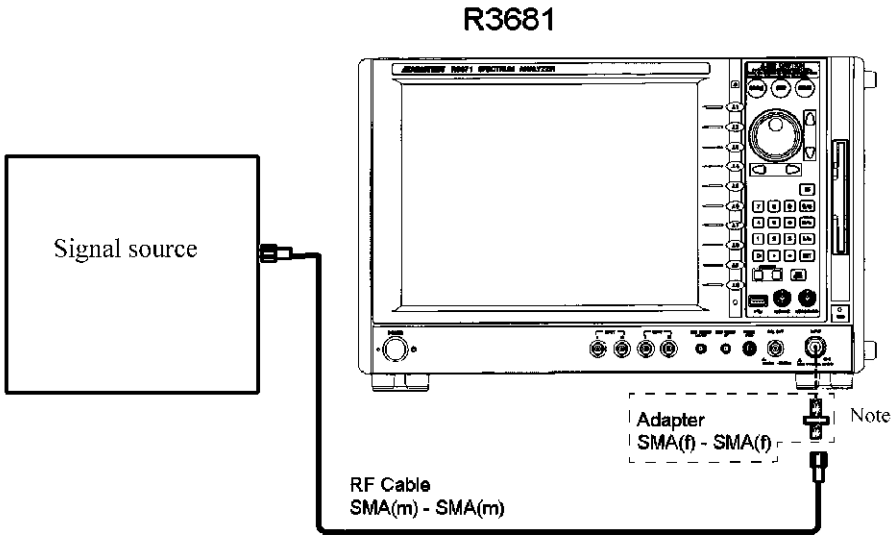
Figure 4-4 Concise Mode Measurement Results

τ	Delay (μs, chip)
Freq Error	Carrier frequency error (Hz, ppm)
EVM	Error Vector Magnitude (%rms)
Peak CDE	Peak code domain error (dB)
Code No. of PCDE	Code number of the Peak CDE
Tx Power	Transmission power (dBm)
P-CPICH Power	P-CPICH power (dBm)

4.1.2 3GPP Base Station Signal Measurements Using the Code Domain Mode

The Code Domain Power etc. for the specified carrier can be measured by using the Code Domain Mode. An example of the Code Domain analysis for the first carrier is shown below.

Connection



Note: The R3671 uses the N(m)-SMA(f) adapter.

Figure 4-5 Connection Diagram Using the Code Domain Mode

Measurement condition setting

1. Touch **[Config]** on the menu bar and select **|Modulation Analyzer|**.
2. Touch **[Modulation]** on the menu bar and select **[3GPP DL]**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **2** and **G/p** on the keypad.
   The center frequency is set to 2 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.

10. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
11. Set the **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.
12. Touch the close button ✕ in the **[Input Setup]** dialog box to close the dialog box.

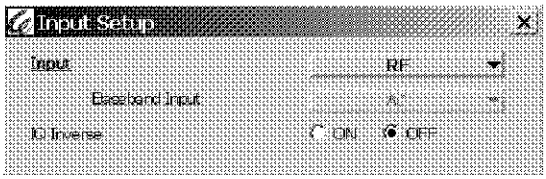


Figure 4-6 **[Input Setup]** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **Code Domain** key on the soft menu bar.
    The Measurement mode is set to the Code Domain mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.
19. Set the **[Meas Band Width]** option button to **[Multi Carrier]**.
    The measurable bandwidth is set to the width of four carriers.
20. Set the **[Setup Carrier]** option button to **[1st Carrier]**.
    The measurement conditions can be set for the first carrier.
21. Touch the **[Carrier Frequency Offset]** text box and press **0** and **ENT** on the keypad.
    The offset frequency from the center frequency is set to 0 Hz.
22. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.
23. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.
24. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.

25. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.
26. Set the **|Meas Carrier|** option button to **|1st|**.
    The first carrier is set to the object to be measured.
27. Set the **[Analysis Rate]** option button to **[7.5 ksps]**.
    The symbol rate to be analyzed is set to 7.5 ksps.
28. Set the **[Meas Length]** option button to **[1 FRAME]**.
    The Measurement length is set to 1 frame.

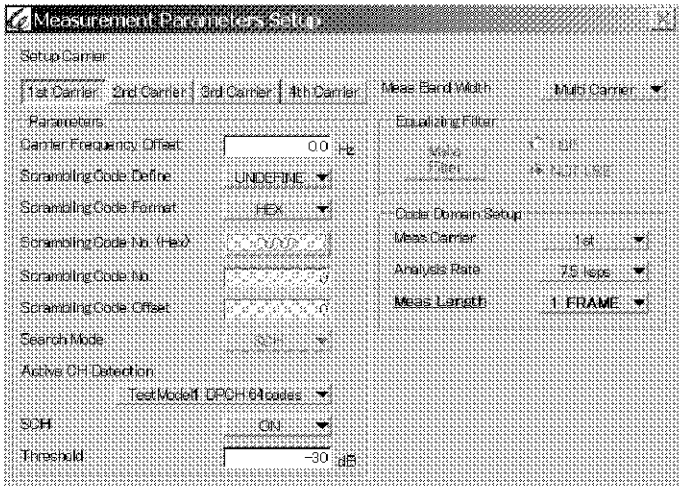


Figure 4-7 **|Measurement Parameters Setup|** Dialog Box

29. Touch the **Return** key on the soft menu bar to close the **|Measurement Parameters Setup|** dialog box.
30. Push the [SINGLE] button on the front panel.
    The Single measurement is executed, and the measurement results are displayed.

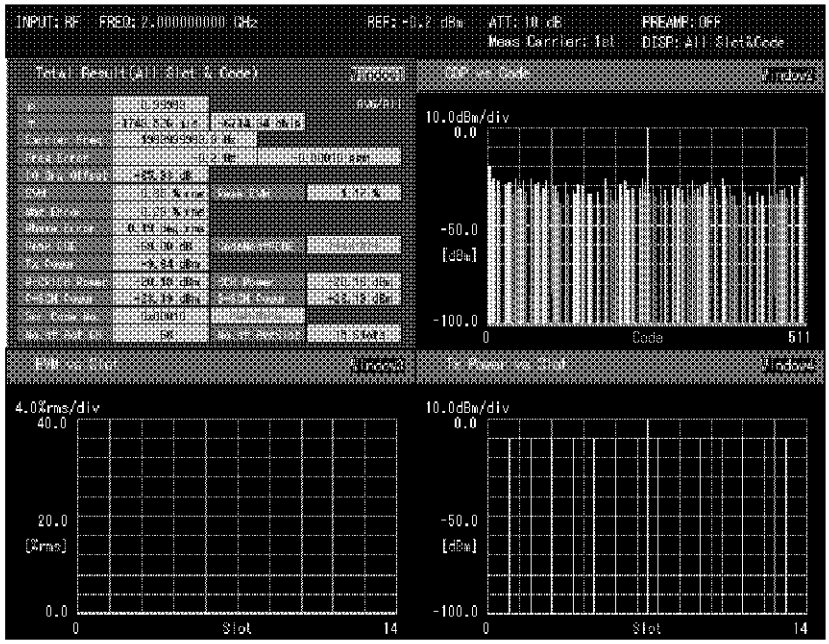


Figure 4-8 Code Domain Mode Measurement Results

Upper left window

ρ	Waveform quality
τ	Delay (μs, chip)
Carrier Freq	Carrier frequency (Hz)
Freq Error	Carrier frequency error (Hz, ppm)
IQ Org Offset	IQ origin offset (dB)
EVM	Error Vector Magnitude (%rms)
Peak EVM	Peak Error Vector Magnitude (%)
Mag. Error	Magnitude error (%rms)
Phase Error	Phase error (deg.rms)
Peak CDE	Peak code domain error (dB)
Code No. of PCDE	Code number of the Peak CDE
Tx Power	Transmission power (dBm)
P-CPICH Power	P-CPICH power (dBm)
SCH Power	SCH power (dBm)
P-SCH Power	P-SCH power (dBm)
S-SCH Power	S-SCH power (dBm)
Scr Code No.	Scrambling Code number (DEC, HEX)
No. of ActCh	Number of active channels
No. of Avg Slot	Number of average slot (Slots)

Upper right window

Horizontal axis - Code

Vertical axis - Code domain power (dBm)

Upper left window

Horizontal axis - Slot

Vertical axis - Error Vector Magnitude (%rms)

Lower right window

Horizontal axis - Slot

Vertical axis - Transmission power (dBm)

4.1.3 EVM Measurement of the DUT by Using the Equalizing Filter

The EVM of the DUT such as amplifiers or filters can be measured with the cancellation of the signal source frequency characteristics by using the Equalizing Filter function. An example, which is measured by using the Equalizing Filter function for the first carrier, is shown below.

Connection

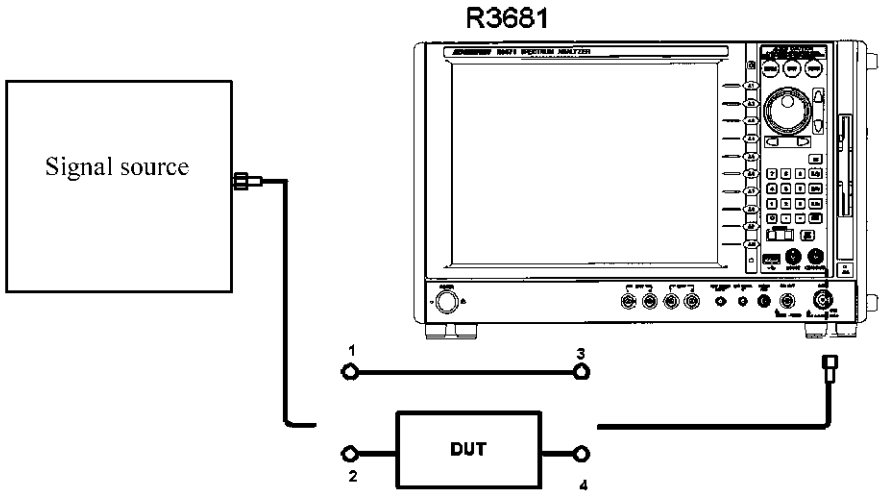


Figure 4-9 Connection Diagram Using the Equalizing Filter

Measurement condition setting

1. Connect the instruments to the 1-3 path.
2. Touch **[Config]** on the menu bar and select **[Modulation Analyzer]**.
3. Touch **[Modulation]** on the menu bar and select **[3GPP DL]**.
4. Touch the **{FREQ}** button on the function bar.
5. Touch the **Center** key on the soft menu bar.
6. Press **2** and **G/p** on the keypad.
   The center frequency is set to 2 GHz.
7. Touch the **{TRIGGER}** button on the function bar.
8. Touch the **Trigger Source** key on the soft menu bar.
9. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.

10. Touch the **{INPUT}** button on the function bar.
11. Touch the **Input Setup** key on the soft menu bar.
    The **|Input Setup|** dialog box appears.
12. Set **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.
13. Touch the close button ✕ in the **[Input Setup]** dialog box to close the dialog box.

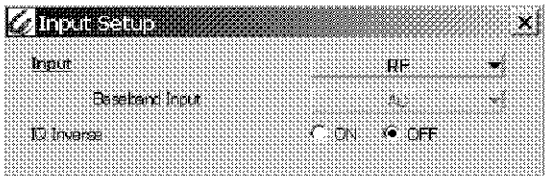


Figure 4-10 **|Input Setup|** Dialog Box

14. Touch the **{LEVEL}** button on the function bar.
15. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
16. Touch the **{MEAS MODE}** button on the function bar.
17. Touch the **Code Domain** key on the soft menu bar.
    The Measurement mode is set to the Code Domain mode.
18. Touch the **{MEAS SETUP}** button on the function bar.
19. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.
20. Set the **|Meas Band Width|** option button to **|Multi Carrier|**.
    The measurable bandwidth is set to the width of four carriers.
21. Set the **[Setup Carrier]** option button to **[1st Carrier]**.
    The measurement conditions can be set for the first carrier.
22. Touch the **[Carrier Frequency Offset]** text box and press **0** and **ENT** on the keypad.
    The offset frequency from the center frequency is set to 0 Hz.
23. Set the **|Scrambling Code Define|** option button to **|UNDEFINE|**.
    The mode, which automatically detects the Scrambling Code number, is set.
24. Set the **[Active CH Detection]** option button to **[TestModel1 DPCH64codes]**.
    The active channel is set to the TestModel1 DPCH64codes multiplex signal.

25. Set the **[SCH]** option button to **[ON]**.
    The SCH portion is set to within the measurement range.

26. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the key-pad.
    The Threshold level is set to -30 dB.

27. Set the **[Meas Carrier]** option button to **[1st]**.
    The first carrier is set to the object to be measured.

28. Set the **[Analysis Rate]** option button to **[7.5 ksps]**.
    The symbol rate to be analyzed is set to 7.5 ksps.

29. Set the **[Meas Length]** option button to **[1 FRAME]**.
    The Measurement length is set to 1 frame.

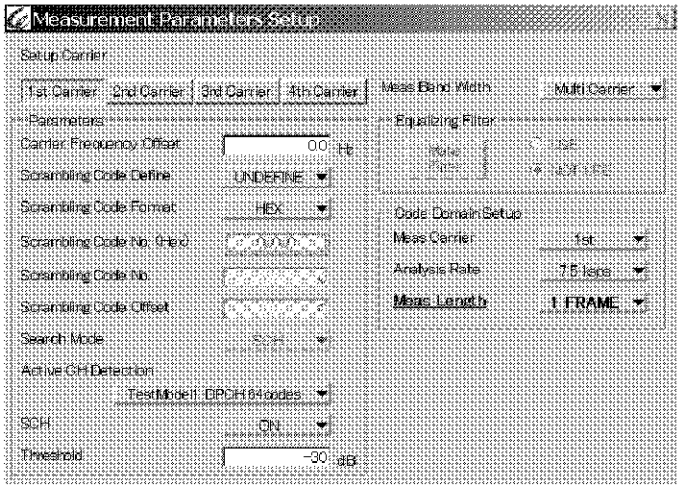


Figure 4-11 **[Measurement Parameters Setup]** Dialog Box

30. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

31. Push the [SINGLE] button on the front panel.
    The Single measurement is executed, and the measurement results are displayed. Verify that the EVM in the upper left window (Total Result) is 17.5% or less.

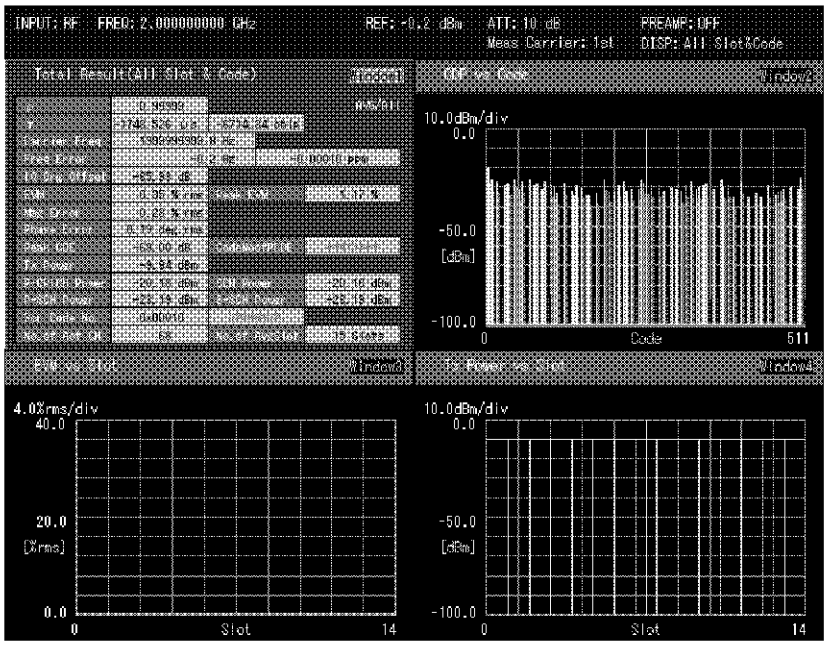


Figure 4-12 Measurement Results of the Code Domain Mode

32. Touch the **Meas Parameters** key on the soft menu bar.
The **|Measurement Parameters Setup|** dialog box appears.

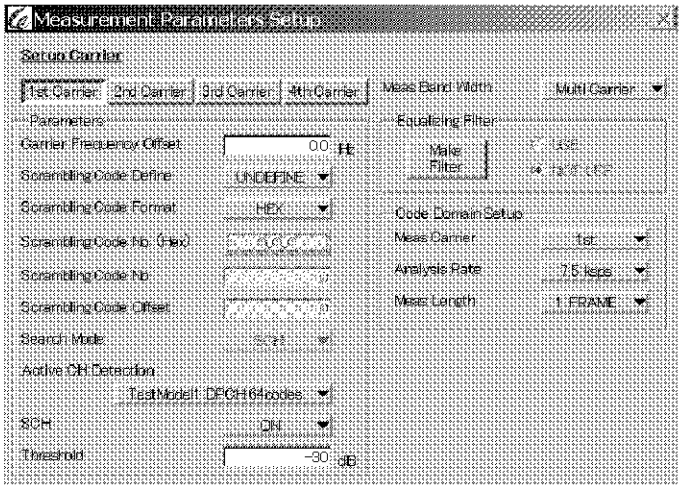


Figure 4-13 **|Measurement Parameters Setup|** Dialog Box

33. Press the **[Make Filter]** button.
The Equalizing Filter coefficient is created.

34. Connect the instruments to the 2-4 path.

35. Touch the **[USE]**.
The mode, which uses the Equalizing Filter coefficient, is set.

36. Touch the **Return** key on the soft menu bar to close the **|Measurement Parameters Setup|** dialog box.

37. Push the **SINGLE** button on the front panel.

    The Single measurement is executed, and the measurement results of the DUT, which are processed by the Equalizer, are displayed.

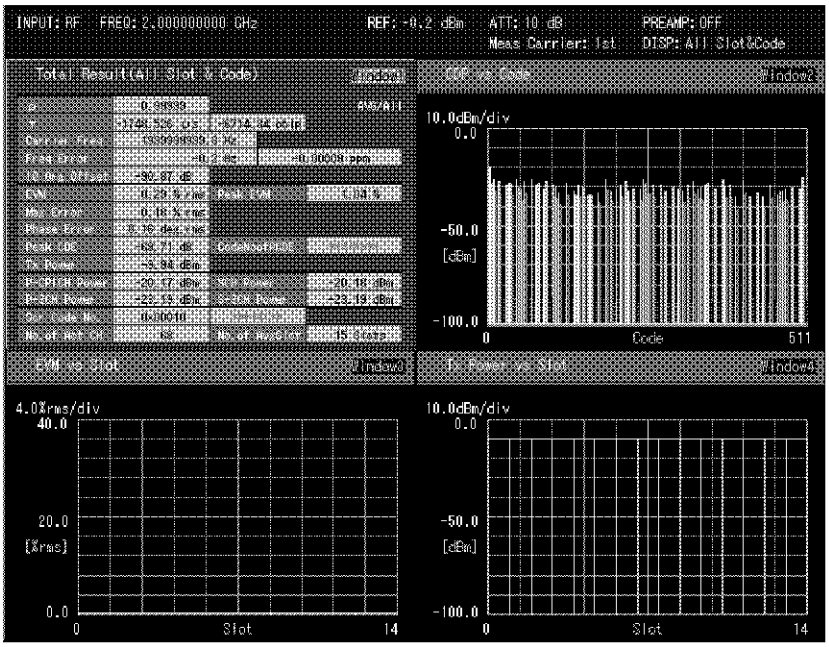


Figure 4-14 Measurement Results of the DUT

Upper left window

ρ	Waveform quality
τ	Delay (μs, chip)
Carrier Freq	Carrier frequency (Hz)
Freq Error	Carrier frequency error (Hz, ppm)
IQ Org Offset	IQ origin offset (dB)
EVM	Error Vector Magnitude (%rms)
Peak EVM	Peak Error Vector Magnitude (%)
Mag. Error	Magnitude error (%rms)
Phase Error	Phase error (deg.rms)
Peak CDE	Peak Code Domain Error (dB)
Code No. of PCDE	Code number of the Peak CDE
Tx Power	Transmission power (dBm)
P-CPICH Power	P-CPICH power (dBm)
SCH Power	SCH power (dBm)

P-SCH Power	P-SCH power (dBm)
S-SCH Power	S-SCH power (dBm)
Scr Code No.	Scrambling Code number (DEC, HEX)
No. of ActCh	Number of active channels
No. of Avg Slot	Number of average slot (Slots)

Upper right window

Horizontal axis - Code

Vertical axis - Code Domain Power (dBm)

Lower left window

Horizontal axis - Slot

Vertical axis - Error Vector Magnitude (%rms)

Lower right window

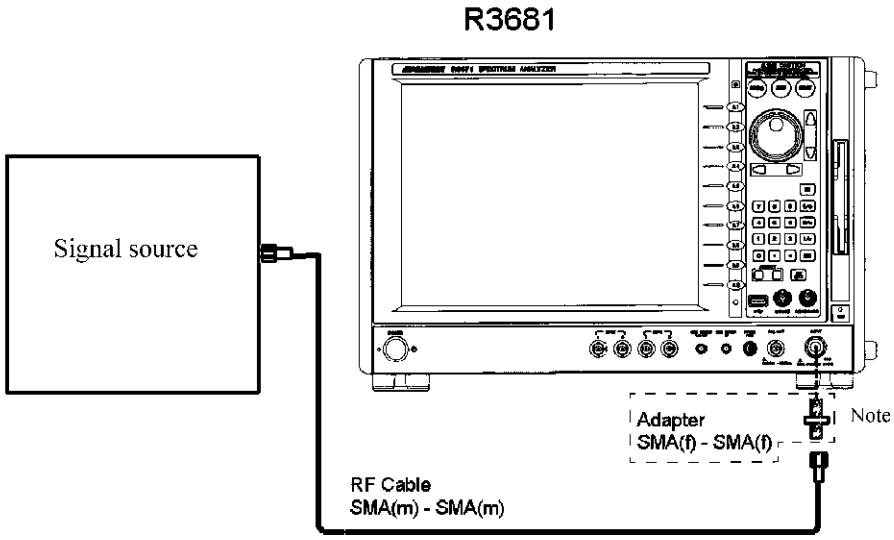
Horizontal axis - Slot

Vertical axis - Transmission power (dBm)

4.1.4 3GPP Base Station Signal Measurements Using the P-CPICH Power Mode

The P-CPICH Power etc. for the specified carrier can be measured by using the P-CPICH Power Mode. An example of the analysis for the first carrier is shown below.

Connection



Note: The R3671 uses the N(m)-SMA(f) adapter.

Figure 4-15 Connection Diagram Using the P-CPICH Power Mode

Measurement condition setting

1. Touch **|Config|** on the menu bar and select **|Modulation Analyzer|**.
2. Touch **[Modulation]** on the menu bar and select **[3GPP DL]**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **2** and **G/p** on the keypad.
   The center frequency is set to 2 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.

10. Touch the **Input Setup** key on the soft menu bar.
    The **|Input Setup|** dialog box appears.
11. Set the **|Input|** in the **|Input Setup|** dialog box to **|RF|**.
    The Input mode is set to RF.
12. Touch the close button ✕ in the **|Input Setup|** dialog box to close the dialog box.

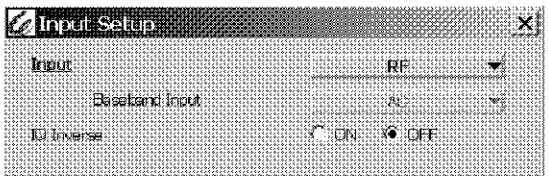


Figure 4-16 **|Input Setup|** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **P-CPICH Power** key on the soft menu bar.
    The Measurement mode is set to the Code Domain mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **|Measurement Parameters Setup|** dialog box appears.
19. Set the **[Setup Carrier]** option button to **[1st Carrier]**.
    The measurement conditions can be set for the first carrier.
20. Touch the **|Carrier Frequency Offset|** text box and press **0** and **ENT** on the keypad.
    The offset frequency from the center frequency is set to 0 Hz.
21. Set the **[Scrambling Code Define]** option button to **[UNDEFINE]**.
    The mode, which automatically detects the Scrambling Code number, is set.
22. Set the **[Meas Carrier]** option button to **[1st]**.
    The first carrier is set to the object to be measured.
23. Set the **[Meas Length]** option button to **[1 FRAME]**.
    The Measurement length is set to 1 frame.

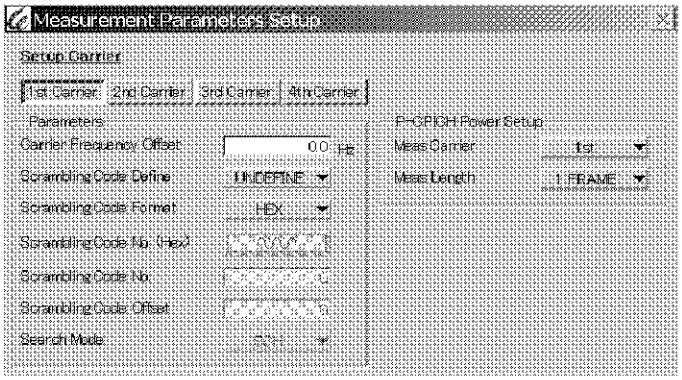


Figure 4-17 **[Measurement Parameters Setup]** Dialog Box

24. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

25. Push the **SINGLE** button on the front panel.
    The Single measurement is executed, and the measurement results are displayed.

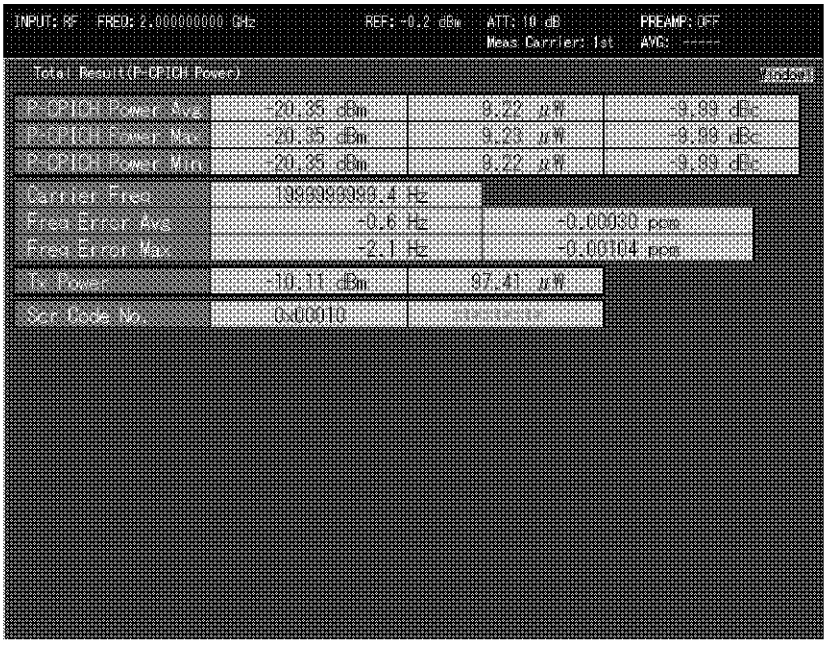


Figure 4-18 Measurement Results of the P-CPICH Power Mode

P-CPICH Power Avg	P-CPICH power average value (dBm, W, dBc)
P-CPICH Power Max	P-CPICH power maximum value (dBm, W, dBc)
P-CPICH Power Min	P-CPICH power minimum value (dBm, W, dBc)
Carrier Freq	Carrier frequency (Hz)
Freq Error Avg	Average Carrier frequency error (Hz, ppm)
Freq Error Max	Maximum Carrier frequency error (Hz, ppm)

Tx Power	Transmitted power (dBm and W)
Scrambling Code No.	Scrambling code number (DEC, HEX)

5. MENU MAP, FUNCTIONAL EXPLANATION(Downlink)

This chapter describes the configurations and functions of the soft keys displayed on the touch screen of the 3GPP modulation analysis option.

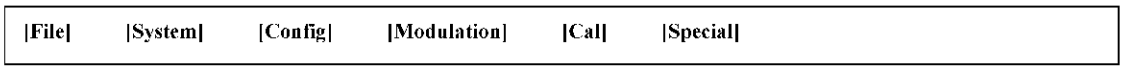
MEMO:

- *[.....] Used to enclose a menu name, key name, item name in the dialog box, button name, or the name of selected items in lists and menus.*
- *{....} Shows a function button on the function bar.*
- *Shows a soft key on the soft menu bar.*
- *A dialog box is surrounded by a broken line.*
- *Operations are supposed to be made through the touch screen and "touch" means to press a button or a key.*

5.1 Menu Index

5.2 Switching Communication Systems

The menu bar of this option is arranged as follows:



The menu bar consists of the same items as those of Spectrum Analyzer.

Select **[Modulation Analyzer]** from **[Config]** on the menu bar to select a modulation analysis function.

Select **[3GPP DL]** from **[Modulation]** on the menu bar to select the 3GPPDownlink modulation analysis function.

5.3 Function Bar

This section describes the functions of each function button displayed on the function bar. The configuration of the function buttons of this option is as follows:

5.4 Soft Menu Bar

The area located on the right-hand side of the screen and in which soft keys are displayed is called the soft menu bar.

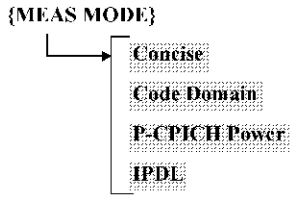
If a button on the function bar is touched, the associated soft keys are displayed on the soft menu bar.

5.5 Description of the Function of Each Key

This section describes the function of each key.

5.5.1 {MEAS MODE}

If the **{MEAS MODE}** button is touched, the soft keys related to the selection of the measurement mode are displayed on the soft menu bar.



Concise

If the **Concise** key is touched, the Concise mode is set. In the Concise mode, a single slot of the signal, which is multiplexed up to 4 carriers, is analyzed for each carrier and the numerical results are displayed.

MEMO: In the Concise mode, the multi carriers can be measured for the same AD data. This mode is suitable for the high-speed measurement to obtain the numerical results.

Code Domain

If the **Code Domain** key is touched, the Code Domain mode is set. In the Code Domain mode, up to 4 frames are analyzed for a single carrier and the numerical results and the graphs are displayed.

MEMO: The analysis in the Code Domain mode can be performed in detail than in the Concise mode. The AD data which is the same used in the Multi-Carrier mode can be analyzed by combining the **Analysis Restart** *key.*

P-CPICH Power

If the **P-CPICH Power** key is touched, the P-CPICH Power mode is set. In the P-CPICH power mode, the P-CPICH power in up to four frames is measured for a single carrier and the numerical result is displayed.

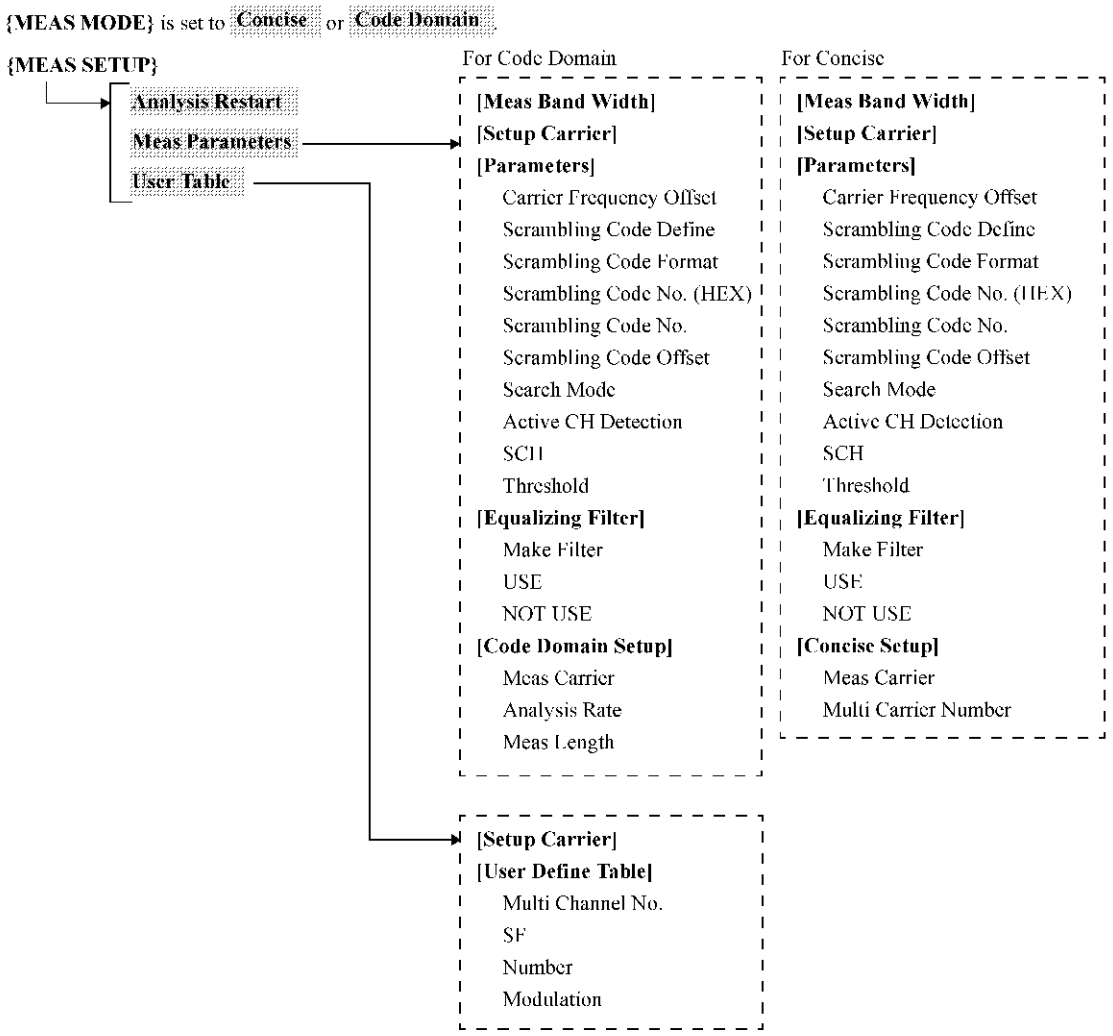
MEMO: The P-CPICH power mode is suitable when the high-speed measurement is performed to acquire only P-CPICH power.

IPDL

If the **IPDL** key is touched, the IPDL time mask measurement mode is set.
Specifies the transmission ON and OFF periods on the time-axis (unit: Chip), and displays the average power in each period and the ratio between the average powers.

5.5.2 {MEAS SETUP}

If the **{MEAS SETUP}** button is touched, the soft keys related to the analysis parameter setting are displayed on the soft menu bar.



When **{MEAS MODE}** is set to **P-CPICH Power**.

{MEAS SETUP}

- **Analysis Restart**
- **Meas Parameters** → **[Setup Carrier]**, **[Parameters]**
  - Carrier Frequency Offset
  - Scrambling Code Define
  - Scrambling Code Format
  - Scrambling Code No. (HEX)
  - Scrambling Code No.
  - Scrambling Code Offset
  - Search Mode

  [P-CPICH Power Setup]
  - Meas Carrier
  - Meas Length
- **Average**

When **{MEAS MODE}** is set to **IPDL**.

{MEAS SETUP}

- **Window On/Off**
- **Window1 Position**
- **Window1 Width**
- **Window2 Position**
- **Window2 Width**

a) When **Concise** or **Code Domain** is selected as **{MEAS MODE}**.

Analysis Restart If the **Analysis Restart** key is touched, the measurement of the AD data, which has already been obtained, re-starts.

Meas Parameters If the **Meas Parameters** key is touched, the dialog box used to set the measurement conditions is displayed.

|Meas Band Width| Selects the bandwidth to be measured.

Single Carrier: Measures signals in the specified carrier bandwidth.

Multi Carrier: Measures signals in the four-carrier bandwidth.

MEMO: **[Multi Carrier]** *is used when two or more carriers are measured for the same AD data.*
[Single Carrier] *is used when a specified carrier is measured.*
|Single Carrier| *is ideal for when a signal includes only one carrier or the carrier power is smaller than that of other carriers.*

|Setup Carrier| Selects the carrier for which the measurement conditions are set.

1st Carrier: Sets the measurement conditions for the 1st carrier.

2nd Carrier: Sets the measurement conditions for the 2nd carrier.

3rd Carrier: Sets the measurement conditions for the 3rd carrier.

4th Carrier: Sets the measurement conditions for the 4th carrier.

|Parameters| Sets the measurement conditions for the carrier specified by **[Setup Carrier]**.

|Carrier Frequency Offset|
Sets the offset frequency from the center frequency. Can be set between -10 MHz and 10 MHz in step of 100 kHz.

[Scrambling Code Define]
Selects the detection method of the Scrambling Code number.

DEFINE: Sets the Scrambling Code number.

UNDEFINE:
Automatically detects the Scrambling Code number.

MEMO: *If the* **[Scrambling Code Define]** *is set to* **[UNDEFINE]**, *the Scrambling Code number is automatically detected. P-SCH and S-SCH are used to detect the Scrambling Code number. If P-SCH and S-SCH are not multiplexed, measurements cannot be performed even if* **[UNDEFINE]** *is set. If 00,10,20, ... or 1FF0[HEX] is used as the Scrambling Code number, measurements can be performed.*

[Scrambling Code Format]
Selects the format that is used to set and display the Scrambling Code number.

HEX: Sets in hexadecimal format.

DEC(×16): Separates the scrambling code number between a code number and offset, and sets them to decimal format.

DEC(=HEX): Sets to decimal format.

[Scrambling Code No.(HEX)]
Sets the Scrambling Code number in hexadecimal.
Valid when **[Scrambling Code Format]** is set to **[HEX]**.

[Scrambling Code No.]
Sets the quotient, which is the result of dividing the Scrambling Code number by 16, to decimal format when the **[Scrambling Code Format]** is set to **[DEC(×16)]**. Sets the Scrambling Code number to decimal format when the **[Scrambling Code Format]** is set to **[DEC(=HEX)]**.

[Scrambling Code Offset]
Sets the remainder, which is the result of dividing the Scrambling Code number by 16, in decimal format. Valid when the **[Scrambling Code Format]** is set to **[DEC(×16)]**.

[Search Mode] Selects the method used to complete the synchronization.

SCH: Synchronizes by using SCH.

P-CPICH: Synchronizes by using P-CPICH.

MEMO: *If* **[Scrambling Code Define]** *is set to* **[UNDEFINE], [Search Mode]** *is set to* **[SCH].**

[Active CH Detection] Selects the detection method of the active channel.

Auto Detection:
Automatically detects the active channel information.

TestModel1 DPCH16codes:
Uses the active channel information of the TestModel1 DPCH16codes which complies with the TS25.141 Standard.

TestModel1 DPCH32codes:
Uses the active channel information of the TestModel1 DPCH32codes which complies with the TS25.141 Standard.

TestModel1 DPCH64codes:
Uses the active channel information of the TestModel1 DPCH64codes which complies with the TS25.141 Standard.

TestModel2:
Uses the active channel information of the TestModel2 which complies with the TS25.141 Standard.

TestModel3 DPCH16codes:
Uses the active channel information of the TestModel3 DPCH16codes which complies with the TS25.141 Standard.

TestModel3 DPCH32codes:
Uses the active channel information of the TTestModel3 DPCH32codes which complies with the TS25.141 Standard.

TestModel4 PCPICH OFF:
Uses the active channel information of the TestModel4 (PCPICH OFF) which complies with the TS25.141 Standard.

TestModel4 PCPICH ON:
Uses the active channel information of the TestModel4 (PCPICH ON) which complies with the TS25.141 Standard.

TestModel5 DPCH6codes:
Uses the active channel information of the TestModel5 DPCH6codes which complies with the TS25.141 Standard.

TestModel5 DPCH14codes:
Uses the active channel information of the TestModel5 DPCH14codes which complies with the TS25.141 Standard.

TestModel5 DPCH30codes:
Uses the active channel information of the TestModel5 DPCH30codes which complies with the TS25.141 Standard.

User Table:
Sets the active channel information to the User Table.

[SCH] Selects whether to include the SCH portion, which consists of the first 256 chips of the P-CPICH slot, in the measurement range.

ON: Includes the SCH portion in the measurement.

OFF: Excludes the SCH portion from the measurement.

[Threshold] Sets the threshold level to determine the active channel. Can be set between - 5 dB and - 40 dB.

MEMO: ***The channel, whose Code Domain Power [dB] is less than the level set by*** **[Threshold]**, ***is determined that the transmission is not performed.***

|Equalizing Filter| Sets to make the Equalizing Filter and sets whether to use it.

|Make Filter| Makes the Equalizing Filter.

[USE] Uses the Equalizing Filter.

[NOT USE] Does not use the Equalizing Filter.

IMPORTANT: ***Sets the*** **|Parameters|** ***correctly when performing the*** **[Make Filter]**.

[Concise Setup] Sets the measurement conditions in the **Concise** mode. This setting is enabled only when the **{MEAS MODE}** is set to Concise.

[Meas Carrier] Selects a carrier to be analyzed. This setting is enabled only when **[Meas Band Width]** is set to **[Single Carrier]**.

1st: Analyzes the first carrier.

2nd: Analyzes the second carrier.

3rd: Analyzes the third carrier.

4th: Analyzes the fourth carrier.

[Multi Carrier Number]
Sets the number of measured carriers. A value from 1 to 4 can be set. This setting is enabled only when **[Meas Band Width]** is set to **[Multi Carrier]**.

[Code Domain Setup] Sets the measurement conditions in the **Code Domain** Mode. Valid only when the **{MEAS MODE}** is set to the Code Domain.

[Meas Carrier] Selects the carrier used to perform the Code Domain analysis.

1st: Analyzes the 1st carrier.

2nd: Analyzes the 2nd carrier.

3rd: Analyzes the 3rd carrier.

4th: Analyzes the 4th carrier.

[Analysis Rate] Selects the symbol rate used to perform the Code Domain analysis.

7.5 ksps: Performs the Code Domain analysis at a symbol rate of 7.5 ksps.

15 ksps: Performs the Code Domain analysis at a symbol rate of 15 ksps.

30 ksps: Performs the Code Domain analysis at a symbol rate of 30 ksps.

60 ksps: Performs the Code Domain analysis at a symbol rate of 60 ksps.

120 ksps: Performs the Code Domain analysis at a symbol rate of 120 ksps.

240 ksps: Performs the Code Domain analysis at a symbol rate of 240 ksps.

480 ksps: Performs the Code Domain analysis at a symbol rate of 480 ksps.

960 ksps: Performs the Code Domain analysis at a symbol rate of 960 ksps.

MEMO: ***The results, which are analyzed at the symbol rate selected in the*** **[Analysis Rate]** ***and analyzed at the active channel symbol rate, are displayed.***

[Meas Length] Selects the signal length used to perform the Code Domain analysis.

1SLOT: Performs the Code Domain analysis over the length of time of one slot.

1FRAME: Performs the Code Domain analysis over the length of time of one frame for each slot.

2FRAME: Performs the Code Domain analysis over the length of time of two frames for each slot.

3FRAME: Performs the Code Domain analysis over the length of time of three frames for each slot.

4FRAME: Performs the Code Domain analysis over the length of time of four frames for each slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

User Table If the **User Table** key is touched, the dialog box used to set the active channel information is displayed.

[Setup Carrier] Selects a carrier.

1st Car: Selects the 1st carrier.

2nd Car: Selects the 2nd carrier.

3rd Car: Selects the 3rd carrier.

4th Car: Selects the 4th carrier.

[User Define Table] Sets the active channel information.

[Multi Channel No.] Sets the number of active channels.

[SF] Sets the SF of each channel which is set in the **[Multi Channel No.]**.

[Number] Sets the code number of each channel which is set in the **[Multi Channel No.]**.

[Modulation] Sets the modulation format of each channel which is set in the **[Multi Channel No.]**. Valid only when the **[SF]** is set to 16.

QPSK: Sets the modulation format to the QPSK.

16QAM: Sets the modulation format to the 16QAM.

IMPORTANT: ***If the SF or the code number is set to not fulfill the orthogonality between the different channels, an error occurs.***

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) When **P-CPICH Power** is selected as **{MEAS MODE}**.

Analysis Restart If the **Analysis Restart** key is touched, the measurement of the AD data, which has already been obtained, re-starts.

Meas Parameters If the **Meas Parameters** key is touched, the dialog box used to set the measurement conditions is displayed.

|Setup Carrier| Selects the carrier for which the measurement conditions are set.

1st Carrier: Sets the measurement conditions for the 1st carrier.

2nd Carrier: Sets the measurement conditions for the 2nd carrier.

3rd Carrier: Sets the measurement conditions for the 3rd carrier.

4th Carrier: Sets the measurement conditions for the 4th carrier.

|Parameters| Sets the measurement conditions for the carrier specified by **|Setup Carrier|**.

|Carrier Frequency Offset|
Sets the offset frequency from the center frequency. Can be set between -10 MHz and 10 MHz in step of 100 kHz.

|Scrambling Code Define|
Selects the detection method of the Scrambling Code number.

DEFINE: Sets the Scrambling Code number.

UNDEFINE:
Automatically detects the Scrambling Code number.

MEMO: ***If the** |Scrambling Code Define| **is set to** |UNDEFINE|, **the Scrambling Code number is automatically detected. P-SCH and S-SCH are used to detect the Scrambling Code number. If P-SCH and S-SCH are not multiplexed, measurements cannot be performed even if** |UNDEFINE| **is set. If 00,10,20, ... or 1FF0[HEX] is used as the Scrambling Code number, measurements can be performed.***

|Scrambling Code Format|
Selects the format that is used to set and display the Scrambling Code number.

HEX: Sets in hexadecimal format.

DEC(×16): Separates the scrambling code number between a code number and offset, and sets them to decimal format.

DEC(=HEX): Sets to decimal format.

|Scrambling Code No.(HEX)|
Sets the Scrambling Code number in hexadecimal.
Valid when **|Scrambling Code Format|** is set to **|HEX|**.

|Scrambling Code No.|
Sets the quotient, which is the result of dividing the Scrambling Code number by 16, to decimal format when the **|Scrambling Code Format|** is set to **|DEC(×16)|**. Sets the Scrambling Code number to decimal format when the **|Scrambling Code Format|** is set to **|DEC(=HEX)|**.

[Scrambling Code Offset]
Sets the remainder, which is the result of dividing the Scrambling Code number by 16, in decimal format. Valid when the **[Scrambling Code Format]** is set to **[DEC(×16)]**.

[Search Mode] Selects the method used to complete the synchronization.

SCH: Synchronizes by using SCH.

P-CPICH:Synchronizes by using P-CPICH.

MEMO: *If* **[Scrambling Code Define]** *is set to* **[UNDEFINE]**, **[Search Mode]** *is set to* **[SCH]**.

[P-CPICH Power Setup] Sets the measurement conditions that are used when the P-CPICH power mode is set.

[Meas Carrier] Selects the carrier used to perform the analysis.

1st: Analyzes the 1st carrier.

2nd: Analyzes the 2nd carrier.

3rd: Analyzes the 3rd carrier.

4th: Analyzes the 4th carrier.

[Meas Length] Selects the signal length used to perform the analysis.

1FRAME:
Performs the analysis over the length of time of one frame for each slot.

2FRAME:
Performs the analysis over the length of time of two frames for each slot.

3FRAME:
Performs the analysis over the length of time of three frames for each slot.

4FRAME:
Performs the analysis over the length of time of four frames for each slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Average Performs the averaging process.

On: Performs the averaging process for the measurements which were performed the set number of times.

Off: Performs no averaging process.

MEMO: ***Max and Min, which are the maximum and minimum values of all the measurement results, display the largest and smallest values from the measurements.***

---

b) When **IPDL** is selected as **{MEAS MODE}**.

Window On/Off — Switches the window display, which shows the measuring period, On and Off.

On: Displays the window in the screen.

Off: Hides the window in the screen.

Window1 Position — Sets the start position of the window that shows the period in which Power1 is measured.

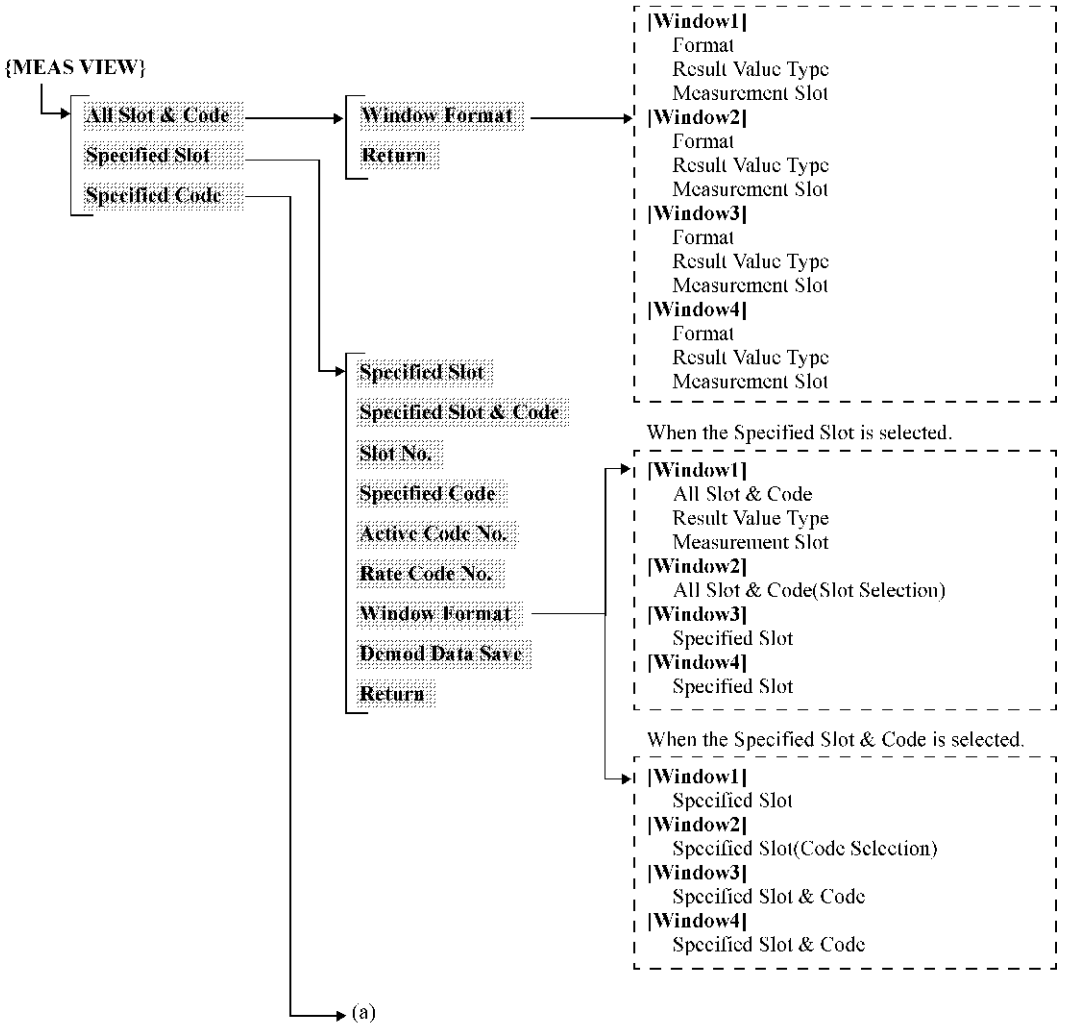
Window1 Width — Sets the window width that shows the period in which Power1 is measured.

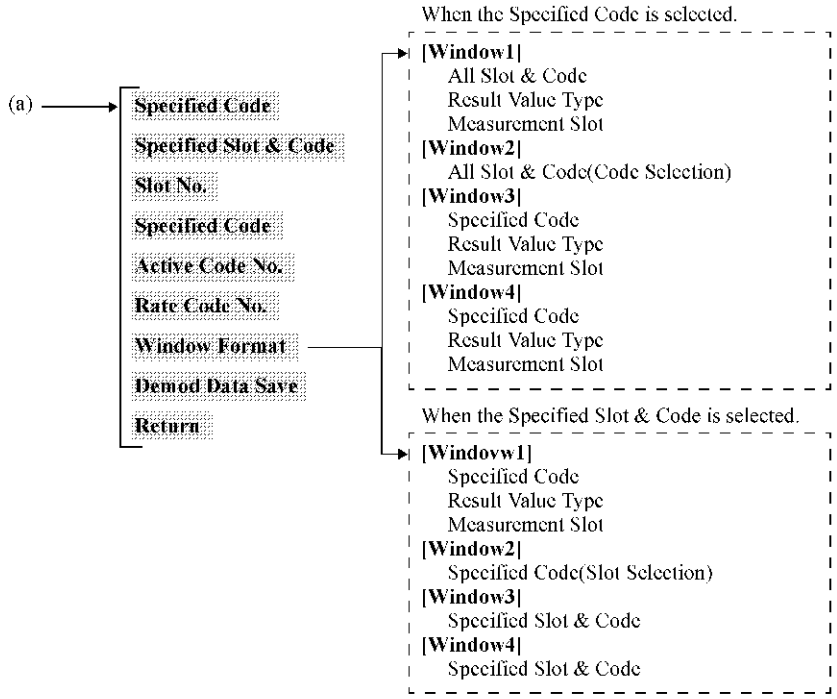
Window2 Position — Sets the start position of the window that shows the period in which Power2 is measured.

Window2 Width — Sets the window width that shows the period in which Power2 is measured.

5.5.3 {MEAS VIEW}

If the **{MEAS VIEW}** button is touched, the soft keys related to the display screen setup are displayed on the soft menu bar. Valid only when the **{MEAS MODE}** is set to the **Code Domain**.





All Slot & Code

If the **All Slot & Code** key is touched, the measurement results for all slots and all codes are displayed.

Window Format

If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

[Window1]

Sets the measurement result window located in the upper left when the 4-window display mode is set.

[Format]

Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal whose modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes for the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window3] Sets for the measurement result window located in the lower left when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes for the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot to perform the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes for the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Specified Slot If the **Specified Slot** key is touched, the measurement results for the specified slot are displayed.

Specified Slot Displays the results for all slots and all codes on the two upper windows, and the results for the specified slot on the two lower windows. The slot can be specified by using the marker which is located in the upper right window, or by using the **Slot No.** key.

Specified Slot & Code Displays the results for the specified slot on the two upper windows, and the results for the specified slot and code on the two lower windows. The slot can be specified by using the **Slot No.** key. The code can be specified by using the marker which is located in the upper right window, or by using the **Code No.** key.

Slot No. Sets the slot number to display the results.

Specified Code Selects the type of the specified code.
Valid only when **Specified Slot & Code** is selected.

Rate: Specifies the code in the symbol rate selected by **[Analysis Rate]**.

Active: Specifies the code of the transmission channel.

Active Code No. Specifies the code number of the transmission channel for which the result is displayed.
Valid only when Active is selected in **Specified Slot & Code** and **Specified Code**.

Rate Code No. Sets the code number for which the result is displayed.
Valid only when Rate is selected in **Specified Slot & Code** and **Specified Code**.

Window Format If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

a) When the **Specified Slot** key is selected.

[Window1] Sets the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[All Slot & Code]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.

|Window2| Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code(Slot Selection)]
Selects the measurement result window to be displayed.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

|Window3| Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) When the **Specified Slot & Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for the slot which is specified by the **Slot No.** are displayed.

[Specified Slot]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for the slot which is specified by the **Slot No.** are displayed.

[Specified Slot(Code Selection)]
Selects the measurement result window to be displayed.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

[Window3] Sets for the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Code No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Constellation:
Displays the constellation of the specified code on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Code No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Constellation:
Displays the constellation of the specified code on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Demod Data Save Saves the same amount of demodulation data of the specified code as the measurement length.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Specified Code If the **Specified Code** key is touched, the measurement results for the specified code are displayed.

Specified Code Displays the results for all slots and all codes on the two upper windows, and the results for the specified code on the two lower windows. The code can be specified by using the marker which is located in the upper right window, or by using the **Code No.** key.

Specified Slot & Code Displays the results for the specified code on the two upper windows, and the results for specified slot and code on the two lower windows. The code can be specified by using the **Code No.** key. The slot can be specified by using the marker which is located in the upper right window, or by using the **Slot No.** key.

Slot No. Sets the slot number to display the results. Valid only when the **Specified Slot & Code** is selected.

Specified Code Selects the type of the specified code.

Rate: Specifies the code in the symbol rate that was selected in **[Analysis Rate]**.

Active: Specifies the code of the transmission channel.

Active Code No. Specifies the code number of the transmission channel for which the result is displayed.
Valid only when Active is selected in **Specified Code**.

Rate Code No. Sets the code number for which the result is displayed.
Valid only when Rate is selected in **Specified Code**.

Window Format If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

a) When the **Specified Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

SCH Power vs Slot:
Displays the SCH Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Active Channel List:
Displays a list of the measurement results of the transmission channels.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[All Slot & Code]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window2] Sets for the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code(Code Selection)]
Selects the measurement result window to be displayed.

CDP vs Code(dBm):
Displays the Code Domain Power [dBm] of each code on a graph.

CDP vs Code(dB):
Displays the Code Domain Power [dB] of each code on a graph.

[Window3] Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Code No.** are displayed.

[Specified Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Specified Code]** is set to **[Total Result]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot which performs the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window4] Sets the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Code No.** are displayed.

[Specified Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Specified Code]** is set to **[Total Result]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot to perform the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) When the **Specified Slot & Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for the code which is specified by the **Code No.** are displayed.

[Specified Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Specified Code]** is set to **[Total Result]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Measurement Slot]
Selects the slot to perform the numerical process selected by the **[Result Value Type]**.

All: Processes for all slots.

QPSK: Processes the slots in which the modulation format is set to the QPSK.

16QAM: Processes the slots in which the modulation format includes 16QAM.

MEMO: ***According to the 3GPP Standard (TS25.141), the specifications of the Error Vector Magnitude are different between the signal of which the modulation format is set to the QPSK, and the signal which includes the 16QAM. Switch the display in accordance with the signal.***

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for the code which is specified by the **Code No.** are displayed.

[Specified Code(Slot Selection)]
Selects the measurement result window to be displayed.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Window3] Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Constellation:
Displays the constellation of the specified code on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

[Window4] Sets the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Constellation:
Displays the constellation of the specified code on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

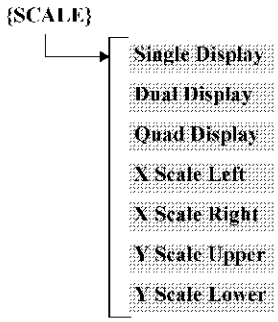
Return — If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Demod Data Save — Saves the same amount of demodulation data of the specified code as the measurement length.

Return — If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

5.5.4 {SCALE}

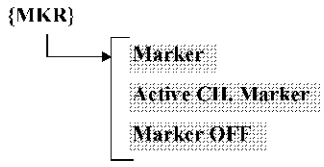
If the **{SCALE}** button is touched, the soft keys related to the setup of the X-axis and Y-axis scales in the active display window are displayed on the soft menu bar.



Single Display	Zooms in the upper left window when the 4-window display mode is set.
Dual Display	Zooms in the upper two windows when the 4-window display mode is set.
Quad Display	Changes the screen to the 4-window display mode.
X Scale Left	Sets the minimum value on the X axis.
X Scale Right	Sets the maximum value on the X axis.
Y Scale Upper	Sets the maximum value on the Y axis.
Y Scale Lower	Sets the minimum value on the Y axis.

5.5.5 {MKR}

If the **{MKR}** button is touched, the soft keys related to the marker setup are displayed on the side menu bar. Valid only when the graph screen is selected.



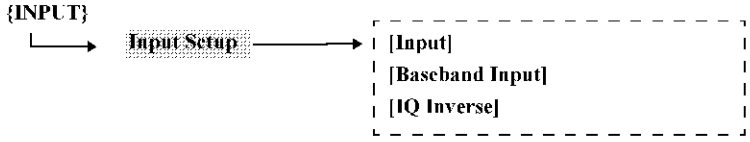
Marker — Sets the X-axis position of the normal marker.

Active CH. Marker — Sets the code number of the active channel. Valid only when the graph, in which the X-axis is set to the code, is displayed.

Marker OFF — Hides the marker.

5.5.6 {INPUT}

If the **{INPUT}** button is touched, the soft keys related to the setting up of the input format for the measuring instrument are displayed on the soft menu bar.



Input Setup If the **Input Setup** key is touched, the dialog box for setting up the input format for the measuring instrument is displayed. Set up in accordance with the measurement signal.

|Input| Sets the input channel for the signal.

RF: Sets the RF signal input.

Baseband (I&Q):
Sets the IQ signal (baseband) input.

[Baseband Input] Sets the coupling for the IQ signal input.

AC: Selects the AC coupling.

DC: Selects the DC coupling.

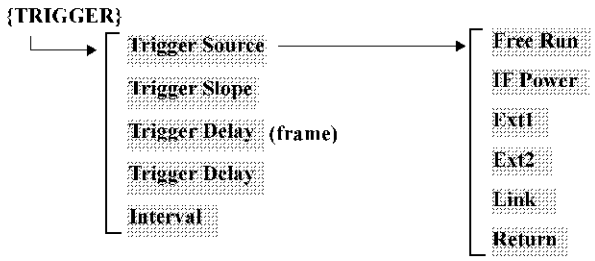
|IQ Inverse| Selects whether or not to invert the phase of the signal to be measured.

ON: Inverts the signal.

OFF: Does not invert the signal.

5.5.7 {TRIGGER}

If the **{TRIGGER}** button is touched, the soft keys related to the trigger setup are displayed on the soft menu bar.



Trigger Source — If the **Trigger Source** is touched, the soft keys related to the trigger setup are displayed on the soft menu bar.

Free Run — Obtains and analyzes data according to the internal timing of the measuring instrument.

IF Power — Obtains and analyzes data synchronized with the IF signal.

Ext1 — Synchronizes the data reading with the external signal and analyzes the data entered into the EXT TRIG IN 1 connector. The threshold level for Ext1 is fixed to the TTL level.

Ext2 — Synchronizes the data reading with the external signal and analyzes the data entered into the EXT TRIG IN 2 connector. The threshold level for Ext2 can be set.

Link — Obtains and analyzes data synchronizing with the trigger of an optional function.

MEMO: ***For information on how to the directions for use of the link trigger, refer to the manual of the option in which the link trigger is used.***

Return — Returns to the previous soft key array on the soft menu bar.

Trigger Slope — Switches the polarity of the trigger slope.
Available only for IF Power, Ext1, Ext2, and Link.

+: Starts sweeping at the rise of a trigger.

-: Starts sweeping at the fall of a trigger.

Trigger Delay (frame) — Sets the delay time from the trigger point in units of frame (1frame: 10 ms). This function is enabled only for IF Power, Ext1, Ext2, and Link. The start position for acquiring A/D data, which is used to analyze, is shifted by the delay time.
(This function is displayed only when **IPDL** is selected as **{MEAS MODE}**.)

Trigger Delay

Sets the delay time from the trigger point. Is available only for IF Power, Ext1, Ext2, and Link. When analyzing, the start position of AD data acquisition is shifted to the delay time.

Interval

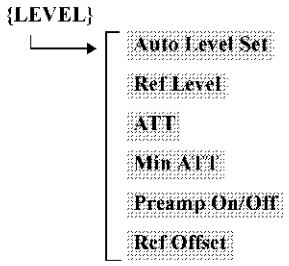
Sets whether to synchronize the trigger with the built-in counter whose period is set to 10 ms.

On: Synchronizes them.

Off: Does not synchronize them.

5.5.8 {LEVEL}

If the **{LEVEL}** button is touched, the soft keys related to the setup of the attenuator and reference level are displayed on the soft menu bar.



Auto Level Set

Sets the reference level to the optimum value in accordance with the signal to be measured. When the key is pressed, Auto Level Set is executed.

IMPORTANT: ***While Auto Level Set is being executed, the level of the signal measured must remain constant.***

Ref Level

Sets the reference level.

ATT

Sets the attenuator.

Auto: Automatically sets the attenuator value based on the reference level.

Man: Sets the attenuator value.

Min ATT

Sets the Min ATT function ON and OFF.

On: Sets the minimum attenuator value and implements control regardless of whether ATT is Auto or Manual.

Off: Cancels the Min ATT limitation.

Preamp On/Off

Sets the preamplifier function ON and OFF.

Ref Offset

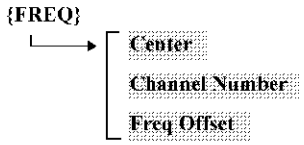
Switches the reference level offset function ON and OFF.

On: Sets the offset value and changes only the displayed reference level by the offset value.
(Displayed reference level = Set value + Offset value)

Off: Cancels the offset function.

5.5.9 {FREQ}

If the **{FREQ}** button is touched, the soft keys related to the measurement frequency setup are displayed on the soft menu bar.



Center

Sets the center frequency of the measurement signal.

IMPORTANT: Set the center frequency correctly. If it is set incorrectly, an error may occur in the center frequency error measurement and the measurement may be incorrect.

Channel Number

When the channel number is set, the center frequency is automatically set by using the following formula.

(Center frequency) = (Channel interval) × (Channel number + Channel offset) + (Start frequency)

The parameters such as the channel interval and the channel number setting range depend on the Standard selected by **|Special|** → **|STD...|**. For more information, refer to the R3681 Series User's Guide.

Freq Offset

Switches the center frequency offset function ON and OFF.

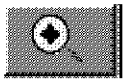
On: Sets the offset value and changes only the displayed center frequency by the offset value.
(Displayed center frequency = Set value + Offset value)

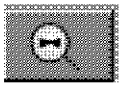
Off: Cancels the offset function.

5.5.10 Measurement Tool Bar

The functions of waveform range selection, active window selection, and so on are displayed as icons.

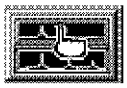
The following functions can be used by touching the icons:


: Zoom in icon: Used to zoom in on the waveform displayed in the window. The range specified by the range specification icon is zoomed in on by touching on the range.


: Zoom out icon: Used to zoom out from the waveform displayed in the window.


: Range specification icon (X-axis mode): Used to specify a range in the window in which the waveform is displayed. After touching the icon, specify the range by touching two points on the graph.


: Range specification icon (range mode): Used to specify a range in the window in which the waveform is displayed. Specify the upper-left and lower-right corners of the range by touching the display.


: Active window switching: Used to make one of the split windows active.


: Range shift icon: Used to shift the display position without changing the display range. After touching the icon, touch the inside of the graph frame in the direction to be shifted.

6. SCPI COMMAND REFERENCE(Downlink)

This chapter describes the SCPI command reference for this instrument.

6.1 Command Reference Format

This section describes the format and layout used to describe commands in this chapter.

Each description includes the following items:

Function description

SCPI command

Parameter

Query reply

- [Function description]

  The usage of commands and operations in this instrument.

- [SCPI command]

  The SCPI command displays the syntax of a command sent from the external controller to this instrument. The syntax consists of a command and a number of parameters. The command and the parameters are separated by a space.

  If a command has multiple parameters, they are separated by commas (,). The three points (...) displayed between commas represent the parameter(s) omitted at that position.

  For example, the description <numeric value 1>,..., <numeric value 4> shows that four parameters, <numeric value 1>, <numeric value 2>, <numeric value 3>, and <numeric value 4>, are required.

  If the parameter is a character string type such as <character string>,<character string 1>, the parameter must be enclosed in double quotation marks (" "). If the parameter is <block>, it shows the block format data.

  Text written in lowercase alphabetic characters in the syntax can be omitted.

  For example, ":CALibration:CABLe" can be abbreviated to ":CAL:CABL."

  The marks used in the syntax are defined as follows:

< >:	Shows a parameter required for sending a command
[ ] :	Shows that the command is optional It can be omitted
{}:	Shows that only one item is required to be selected from multiple items
|:	Used as a delimiter for multiple items written in curly brackets {..}
<ch>:	Written in the command header and shows the target input channel number of the command The channel number can be omitted. However, when it is written, channel number 1 is selected
<screen>:	Written in the command header and shows the target screen number of the command The screen number can be omitted. However, when it is written, a value from 1 to 4 can be selected [{1|2|3|4}]

For example, If the syntax below is specified, :CALC:CORR:EDEL:TIME 0.1 and : CALCULATE1:SELECTED:CORR:EDEL:TIME 25E-3 are valid.

Syntax: CALCulate{[1]|2|3|4}[:SELected]:CORRection:EDELay:TIME <numeric value>

- [Parameter]

  Describes a parameter required for sending a command.

  If the parameter is numeric type or alphabetic, it is enclosed in angle brackets (< >).

  If the parameter is optional, it is enclosed in curly brackets ({ }).

  In this manual, parameter types are described in the following formats:

  < int >: A numeric value that can be input in the format NR1, NR2, or NR3 and rounded to an integer in this instrument

  < real >: A numeric value that can be input in the format NR1, NR2, or NR3 and rounded to a valid-digit real number in this instrument

  < bool >: Either OFF or ON can be entered.

  < str >: A character string enclosed in quotation (' ') or double quotation (" ") marks.

  <block>: Block data type
  The data content is an 8-bit binary data array

  < type >: Character data selected from multiple types

- [Query reply]

  When there is a query reply to the command, the data format used for reading the query is described.

  Each parameter to be read is enclosed in curly brackets ({ }). If multiple items, which are delimited by a vertical bar (|), exist in curly brackets ({ }), only one of those items is read out. If parameters are delimited by commas (,) multiple parameters can be read out. The three points (...) displayed between commas represent data omitted from that position. For example, the description {numeric value 1},..., {numeric value 4} shows that four parameters {numeric value 1}, {numeric value 2}, {numeric value 3}, and {numeric value 4} are read.

  If the parameter to be read is enclosed in square brackets ([ ]), the parameter may be omitted, depending on the measurement result, etc.

  If the parameter to be read is a value in a unit, a description such as "Unit: dBm" is added to display the unit of the parameter value. However, only when the parameter is described in a level unit "dBm", the level unit selected at that time will be applied to the parameter.

6.2 Common Commands

This section describes common IEEE commands.

Function description	SCPI Command	Parameter	Query reply	Remarks
Clears the status byte and related data	*CLS	-	-	
Macro definition for GET	*DDT	<block>	<block>	*1
Sets the standard event status enable register	*ESE	<int>	<int>	
Reads the standard event status register	*ESR?	-	<int>	
Device inquiry	*IDN?	-	<str>	*2
Notifies when all running operations are complete	*OPC	-	1	
Loads the device settings	*RCL	<int> | POFF	-	*3
Resets the device	*RST	-	-	
Saves the device settings	*SAV	<int>	<int>	
Sets the service request enable register	*SRE	<int>	<int>	
Reads the status byte register	*STB?	-	<int>	
Triggers the device	*TRG	-	-	
Waits until all running operations are complete	*WAI	-	-	

*1: If the *DDT? command is executed when the macro is undefined, a zero-length block data (#10) is returned.
*2: <str> is output in the following format: maker name, model name, serial number and version number.
*3: POFF indicates the parameter settings when the power was last switched off.

6.3 List of Commands

6.3.1 Subsystem-SYSTem

Function description	SCPI command	Parameter	Query reply	Remarks
Config				
Measurement system selection	:SYSTem:SELect	SANalyzer|MANalyzer	SAN|MAN	
Modulation				
Modulation analysis system selection	:SYSTem:SELect:MODulation	W3GPPDL	W3GPPDL	
Preset				
Each measurement system parameter initialization	:SYSTem:PRESet	–	–	
All measurement systems initialization	:SYSTem:PRESet:ALL	–	–	
Log				
Inquiry about the error that occurred last	:SYSTem:ERRor?	–	<int>,<str>	
Inquiry about the details of the error log	:SYSTem:ERRor:ALL?	–	<int>,<str>	

6.3.2 Subsystem-INPut

Function description	SCPI command	Parameter	Query reply	Remarks
ATT/Preamp				
ATT setting (Manual)	:INPut:ATTenuation	<real>	<real>	
ATT (Auto/Manual)	:INPut:ATTenuation:AUTO	OFF|ON	OFF|ON	
Min ATT setting	:INPut:ATTenuation:MINimum	<real>	<real>	
Min ATT ON/OFF	:INPut:ATTenuation:MINimum:STATe	OFF|ON	OFF|ON	
Preamp ON/OFF	:INPut:GAIN:STATe	OFF|ON	OFF|ON	
Input Setup				
Input Signal RF/Baseband	:INPut:SIGNal	RF|BASeband	RF|BAS	*1
Baseband Input AC/DC	:INPut:BASeband	AC|DC	AC|DC	*2
IQ Inverse ON/OFF	:INPut:IQ:INVerse	OFF|ON	OFF|ON	

*1: The Level setting item is invalid when selecting the Baseband.
*2: Only valid when selecting the Baseband.

6.3.3 Subsystem-CONFigure

Function description	SCPI command	Parameter	Query reply	Remarks
Meas Mode				
Concise mode setting	:CONFigure:CONCise	–	–	
Code Domain mode setting	:CONFigure:CDOMain	–	–	
P-CPICH Power mode setting	:CONFigure:PCPICH	–	–	
IPDL mode setting	:CONFigure:IPDL	–	–	

6.3.4 Subsystem-SENSe

Function description	SCPI command	Parameter	Query reply	Remarks
FREQuency				
Center Freq setting	[:SENSe]:FREQuency:CENTer	<real>	<real>	
Freq Offset setting	[:SENSe]:FREQuency:OFFSet	<real>	<real>	
Freq Offset ON/OFF	[:SENSe]:FREQuency:OFFSet:STATe	OFF|ON	OFF|ON	
Channel Number setting	[:SENSe]:FREQuency:CHANnel:NUMBer	<int>	<int>	
Auto Level Set				
Auto Level Set execution	[:SENSe]:POWer:LEVel:AUTO	–	–	
Measurement Parameter				
Carrier Frequency Offset setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:CFOFfset	<real>	<real>	
Scrambling Code Define setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCDefine	DEFine|UNDefine	DEF|UND	*3
Scrambling Code No. setting (specified in decimal number)	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCNumber:DEC	<int>	<int>	*3
Scrambling Code No. setting (specified in hexadecimal number)	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCNumber:HEX	#H*****	#H*****	*3
Scrambling Code No. setting (DEC(=HEX))	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCNumber:DHEX	<int>	<int>	
Scrambling Code Offset setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCOFfset	<int>	<int>	*3
Search Mode setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SMODe	SCH|PCPICH	SCH|PCPICH	*3
Measurement Parameter (Concise/Code Domain)				
Meas Band Width setting	[:SENSe]:CONDition:MBWidth	SINGle|MULTi	SING|MULT	

6.3.4 Subsystem-SENSe

Function description	SCPI command	Parameter	Query reply	Remarks
Active CH Detection setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :ACDetection	AUTO|USER| T1DP16|T1DP32| T1DP64|T2| T3DP16|T3DP32| T4PCOFF| T4PCON| T5DP6|T5DP14| T5DP30	AUTO|USER| T1DP16|T1DP32| T1DP64|T2| T3DP16|T3DP32| T4PCOFF| T4PCON|T5DP6| T5DP14|T5DP30	*3
SCH ON/OFF	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:SCH	OFF|ON	OFF|ON	*3
Threshold setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :THReshold	<int>	<int>	*3
Creating Equalizing Filter	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :EQUAlizer:MAKE	–	–	*3
Equalizing Filter USE/NOT USE	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :EQUAlizer	NOT|USE	NOT|USE	*3
Meas Carrier setting	[:SENSe]:CONDition:MCARrier	1|2|3|4	1|2|3|4	
Measurement Parameter (Code Domain)				
Analysis Rate setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>]:RATE	R7500|R15000| R30000|R60000| R120000| R240000| R480000| R960000	R7500|R15000| R30000|R60000| R120000| R240000| R480000| R960000	*3
Meas Length setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :MLENgth	M1SLot| M1FRame| M2FRame| M3FRame| M4FRame	M1SL|M1FR| M2FR|M3FR| M4FR	*3
Measurement Parameter (Concise)				
Multi Carrier Number setting	[:SENSe]:CONDition:CARRier:NUMBer	<int>	<int>	
Measurement Parameter (P-CPICH Power)				
Meas Carrier setting	[:SENSe]:CONDition:PCPICH:MCARrier	<int>	<int>	
Meas Length setting	[:SENSe]:CONDition:PCPICH[:CARRier <carr=1|2|3|4>]:MLENgth	M1FRame| M2FRame| M3FRame| M4FRame	M1FR|M2FR| M3FR|M4FR	
User Table				
Multi Channel No. setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :UTABle:MCNumber	<int>	<int>	*3
SF setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :UTABle:SF<utch=1~75>	4|8|16|32|64|128| 256|512	4|8|16|32|64|128| 256|512	
Number setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :UTABle:NUMBer<utch=1~75>	<int>	<int>	
Modulation setting	[:SENSe]:CONDition[:CARRier<carr=1|2|3|4>] :UTABle:MODulation<utch=1~75>	QPSK|QAM16	QPSK|QAM16	

*3: When :CARRier<carr> is omitted, the setting is specified to 1.

Function description	SCPI command	Parameter	Query reply	Remarks
Average				
Average ON/OFF	[:SENSe]:CONDition:AVERage[:STATe]	OFF|ON	OFF|ON	
Average count setting	[:SENSe]:CONDition:AVERage:COUNt	<int>	<int>	
Window setting (IPDL)				
Window display ON/OFF setting	[:SENSe]:IPDL:WINDow[:STATe]	OFF|ON	OFF|ON	
Window1 display position setting	[:SENSe]:IPDL:WINDow:NUMBer1:POSition	<int>	<int>	
Window1 display width setting	[:SENSe]:IPDL:WINDow:NUMBer1:WIDTh	<int>	<int>	
Window2 display position setting	[:SENSe]:IPDL:WINDow:NUMBer2:POSition	<int>	<int>	
Window2 display width setting	[:SENSe]:IPDL:WINDow:NUMBer2:WIDTh	<int>	<int>	

6.3.5 Subsystem-TRIGger

Function description	SCPI command	Parameter	Query reply	Remarks
SEQuence				
Trigger Source	:TRIGger[:SEQuence]:SOURce	IMMediate|IF| EXTernal1| EXTernal2|LINK	IMM|IF|EXT1| EXT2|LINK	
Trigger Slope	:TRIGger[:SEQuence]:SLOPe	POSitive| NEGative	POS|NEG	
IF Trigger Level setting	:TRIGger[:SEQuence]:LEVel:IF	<real>	<real>	
Ext Level setting	:TRIGger[:SEQuence]:LEVel:EXTernal	<real>	<real>	
Trigger Delay setting	:TRIGger[:SEQuence]:DELay	<real>	<real>	
Trigger Delay setting (frame)	:TRIGger[:SEQuence]:DELay:FRAMe	<int>	<int>	
Interval Trigger setting	:TRIGger[:SEQuence]:INTerval:STATe	OFF|ON	OFF|ON	

6.3.6 Subsystem-INITiate

Function description	SCPI command	Parameter	Query reply	Remarks
INITiate				
Repeat Measurement execution	:INITiate:MEASure:REPeat	–	–	
Single Measurement execution	:INITiate:MEASure:SINGle	–	–	
Re-calculation of the acquired data	:INITiate:RESTart	–	–	
Measurement stop	:INITiate:ABORt	–	–	

6.3.7 Subsystem-CALCulate

Function description	SCPI command	Parameter	Query reply	Remarks
MARKer				
Marker ON/OFF	:CALCulate:MARKer<scrn=1|2|3|4>[:STATe]	OFF|ON	OFF|ON	
Marker X setting	:CALCulate:MARKer<scrn=1|2|3|4>:X	<real>	<real>	
Reading Marker Y	:CALCulate:MARKer<scrn=1|2|3|4>:Y	–	<real>	
Active CH. Marker ON/OFF	:CALCulate:ACMarker<scrn=1|2|3|4>[:STATe]	OFF|ON	OFF|ON	
Active CH. Marker X setting	:CALCulate:ACMarker<scrn=1|2|3|4>:X	<real>	<real>	
Reading Active CH. Marker Y	:CALCulate:ACMarker<scrn=1|2|3|4>:Y	–	<real>	
Marker setting in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:CHIP	<int>	<int>	
I reading in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:I	–	<real>	
Q reading in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:Q	–	<real>	
Result Value Type of Total Result in ALL Slot & Code measurement setting	:CALCulate:ASCode:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Measurement Slot of Total Result in ALL Slot & Code measurement setting	:CALCulate:ASCode:MSLot	ALL|QPSK|QAM16	ALL|QPSK|QAM16	
Result Value Type of Total Result in Specified Code measurement setting	:CALCulate:SCODe:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Measurement Slot of Total Result in Specified Code measurement setting	:CALCulate:SCODe:MSLot	ALL|QPSK|QAM16	ALL|QPSK|QAM16	

6.3.8 Subsystem-DISPlay

Function description	SCPI command	Parameter	Query reply	Remarks
Level				
Ref Level setting	:DISPlay:TRACe:Y[:SCALe]:RLEVel	<real>	<real>	
Level Offset setting	:DISPlay:TRACe:Y[:SCALe]:RLEVel:OFFSet	<real>	<real>	
Level Offset ON/OFF	:DISPlay:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe	OFF|ON	OFF|ON	
dB/div value (IPDL) setting	:DISPlay:TRACe:Y[:SCALe]:PDIVision	<real>	<real>	
Display				
Result display screen mode setting	:DISPlay:MODE	ASCode|SSLot| SSCode|SCODe| SCSLot	ASC|SSL|SSC| SCOD|SCSL	
Slot No. setting (Specified Slot)	:DISPlay:MODE:SSLot:SLOT	<int>	<int>	
Rate Code No. setting (Specified Slot)	:DISPlay:MODE:SSLot:CODE:RATE	<int>	<int>	
Active Code No. setting (Specified Slot)	:DISPlay:MODE:SSLot:CODE:ACTive	<int>	<int>	
Code Rate/Active setting (Specified Slot)	:DISPlay:MODE:SSLot:CODE:STATe	RATE|ACTive	RATE|ACT	
Slot No. setting (Specified Code)	:DISPlay:MODE:SCODe:SLOT	<int>	<int>	
Rate Code No. setting (Specified Code)	:DISPlay:MODE:SCODe:CODE:RATE	<int>	<int>	
Active Code No. setting (Specified Code)	:DISPlay:MODE:SCODe:CODE:ACTive	<int>	<int>	
Code Rate/Active setting (Specified Code)	:DISPlay:MODE:SCODe:CODE:STATe	RATE|ACTive	RATE|ACT	
WINDow (All Slot & Code)				
Window Format setting	:DISPlay:MODE:ASCode:WINDow<scrn=1|2|3|4> :FORMat	TRESult|CDBM| CDDB|EVM| POWer|SPOWer| FERRor|PCDE| ACList	TRES|CDBM| CDDB|EVM| POW|SPOW| FERR|PCDE|ACL	
Window Result Value Type setting	:DISPlay:MODE:ASCode:WINDow<scrn=1|2|3|4> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Window Measurement Slot setting	:DISPlay:MODE:ASCode:WINDow<scrn=1|2|3|4> :FORMat:MSLot	ALL|QPSK| QAM16	ALL|QPSK| QAM16	
WINDow (Specified Slot - Specified Slot)				
Window Format setting (Window 1)	:DISPlay:MODE:SSLot:WINDow<scrn=1>:FORMat	TRESult|CDBM| CDDB|EVM| POWer|SPOWer| FERRor|PCDE| ACList	TRES|CDBM| CDDB|EVM| POW|SPOW| FERR|PCDE|ACL	
Window Format setting (Window 2)	:DISPlay:MODE:SSLot:WINDow<scrn=2>:FORMat	EVM|POWer| SPOWer|FERRor| PCDE	EVM|POW| SPOW|FERR| PCDE	

6.3.8 Subsystem-DISPlay

Function description	SCPI command	Parameter	Query reply	Remarks
Window Format setting (Windows 3/4)	:DISPlay:MODE:SSLot:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| CDDB|EVM| MERRor|PERRor| CONStellation| ACList	TRES|CDBM| CDDB|EVM| MERR|PERR| CONS|ACL	
Result Value Type setting (Window 1)	:DISPlay:MODE:SSLot:WINDow<scrn=1> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Measurement Slot setting (Window 1)	:DISPlay:MODE:SSLot:WINDow<scrn=1> :FORMat:MSLot	ALL|QPSK| QAM16	ALL|QPSK| QAM16	
WINDow (Specified Slot - Specified Slot & Code)				
Window Format setting (Window 1)	:DISPlay:MODE:SSCode:WINDow<scrn=1> :FORMat	TRESult|CDBM| CDDB|EVM| MERRor|PERRor| CONStellation| ACList	TRES|CDBM| CDDB|EVM| MERR|PERR| CONS|ACL	
Window Format setting (Window 2)	:DISPlay:MODE:SSCode:WINDow<scrn=2> :FORMat	CDBM|CDDB	CDBM|CDDB	
Window Format setting (Windows 3/4)	:DISPlay:MODE:SSCode:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| CDDB|EVM| CONStellation| DDATa	TRES|CDBM| CDDB|EVM| CONS|DDAT	
WINDow (Specified Code - Specified Code)				
Window Format setting (Window 1)	:DISPlay:MODE:SCODe:WINDow<scrn=1>:FORMat	TRESult|CDBM| CDDB|EVM| POWer|SPOWer| FERRor|PCDE| ACList	TRES|CDBM| CDDB|EVM| POW|SPOW| FERR|PCDE|ACL	
Window Format setting (Window 2)	:DISPlay:MODE:SCODe:WINDow<scrn=2>:FORMat	CDBM|CDDB	CDBM|CDDB	
Window Format setting (Windows 3/4)	:DISPlay:MODE:SCODe:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| EVM	TRES|CDBM| EVM	
Result Value Type setting (Window 1/3/4)	:DISPlay:MODE:SCODe:WINDow<scrn=1|3|4> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Measurement Slot setting (Window 1/3/4)	:DISPlay:MODE:SCODe:WINDow<scrn=1|3|4> :FORMat:MSLot	ALL|QPSK| QAM16	ALL|QPSK| QAM16	
WINDow (Specified Code - Specified Slot & Code)				
Window Format setting (Window 1)	:DISPlay:MODE:SCSLot:WINDow<scrn=1>:FORMat	TRESult|CDBM| EVM	TRES|CDBM| EVM	
Window Format setting (Window 2)	:DISPlay:MODE:SCSLot:WINDow<scrn=2>:FORMat	CDBM|EVM	CDBM|EVM	
Window Format setting (Windows 3/4)	:DISPlay:MODE:SCSLot:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| CDDB|EVM| CONStellation| DDATa	TRES|CDBM| CDDB|EVM| CONS|DDAT	
Result Value Type setting (Window 1)	:DISPlay:MODE:SCSLot:WINDow<scrn=1> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Measurement Slot setting (Window 1)	:DISPlay:MODE:SCSLot:WINDow<scrn=1> :FORMat:MSLot	ALL|QPSK| QAM16	ALL|QPSK| QAM16	

Function description	SCPI command	Parameter	Query reply	Remarks
Scale				
Multi Screen setting	:DISPlay	SINGle|DUAL|QUAD	SING|DUAL|QUAD	
X Scale Left setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe:X[:SCALe]:LEFT	<real>	<real>	
X Scale Right setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe:X[:SCALe]:RIGHt	<real>	<real>	
Y Scale Upper setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe:Y[:SCALe]:UPPer	<real>	<real>	
Y Scale Lower setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe:Y[:SCALe]:LOWer	<real>	<real>	

6.3.9 Subsystem-MMEMory

Function description	SCPI command	Parameter	Query reply	Remarks
Save/Load				
Saving the settings of this instrument	:MMEMory:STORe:STATe	<int>	–	*4
Loading the settings of this instrument	:MMEMory:LOAD:STATe	<int>	–	*4
Measurement condition Save selection	:MMEMory:SELect:ITEM:GPPDL:SETup	OFF|ON	OFF|ON	
Demod Data Save execution	:MMEMory:STORe:DDATa:STATe	<int>	<int>	

*4: A number, which is a maximum of 4-digit and is added to the file name of the data to be saved or loaded, must be specified in <int>.

6.3.10 Subsystem-MEASure

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Concise)				
τ	:MEASure:CONCise:TRESult:TAU?	–	<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>	
Carrier Frequency Error	:MEASure:CONCise:TRESult:FERRor?	–	<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>	
EVM	:MEASure:CONCise:TRESult:EVM?	–	<real>,<real>,<real>,<real>	
Peak CDE	:MEASure:CONCise:TRESult:PCDE?	–	<real>,<real>,<real>,<real>	
Code Number of PCDE	:MEASure:CONCise:TRESult:PCDE:NUMBer?	–	<real>,<real>,<real>,<real>	
Tx Power	:MEASure:CONCise:TRESult:POWer?	–	<real>,<real>,<real>,<real>	
Primary CPICH Power	:MEASure:CONCise:TRESult:PCPICH:POWer?	–	<real>,<real>,<real>,<real>	
Total Result (ALL Slot & Code)				
ρ	:MEASure:ASCode:TRESult:RHO?	–	<real>	
τ	:MEASure:ASCode:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:MEASure:ASCode:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:MEASure:ASCode:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:MEASure:ASCode:TRESult:IQOFfset?	–	<real>	
EVM	:MEASure:ASCode:TRESult:EVM?	–	<real>	
Peak EVM	:MEASure:ASCode:TRESult:PEVM?	–	<real>	
Mag. Error	:MEASure:ASCode:TRESult:MERRor?	–	<real>	
Phase Error	:MEASure:ASCode:TRESult:PERRor?	–	<real>	
Peak CDE	:MEASure:ASCode:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:MEASure:ASCode:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:MEASure:ASCode:TRESult:POWer?	–	<real>	
Primary CPICH Power	:MEASure:ASCode:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:MEASure:ASCode:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:MEASure:ASCode:TRESult:PSCH:POWer?	–	<real>	
S-SCH Power	:MEASure:ASCode:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:MEASure:ASCode:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:MEASure:ASCode:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:MEASure:ASCode:TRESult:ACHannel?	–	<int>	
Number Of Average Slot	:MEASure:ASCode:TRESult:AVERage:SLOT?	–	<int>	

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Specified Slot - Specified Slot)				
ρ	:MEASure:SSLot:TRESult:RHO?	–	<real>	
τ	:MEASure:SSLot:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:MEASure:SSLot:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:MEASure:SSLot:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:MEASure:SSLot:TRESult:IQOFfset?	–	<real>	
EVM	:MEASure:SSLot:TRESult:EVM?	–	<real>	
Peak EVM	:MEASure:SSLot:TRESult:PEVM?	–	<real>	
Mag. Error	:MEASure:SSLot:TRESult:MERRor?	–	<real>	
Phase Error	:MEASure:SSLot:TRESult:PERRor?	–	<real>	
Peak CDE	:MEASure:SSLot:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:MEASure:SSLot:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:MEASure:SSLot:TRESult:POWer?	–	<real>	
Primary CPICH Power	:MEASure:SSLot:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:MEASure:SSLot:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:MEASure:SSLot:TRESult:PSCH:POWer?	–	<real>	
S-SCH Power	:MEASure:SSLot:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:MEASure:SSLot:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:MEASure:SSLot:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:MEASure:SSLot:TRESult:ACHannel?	–	<int>	
P-CPICH Slot Number	:MEASure:SSLot:TRESult:PCPICH:SLOT?	–	<int>	
Total Result (Specified Slot - Specified Slot & Code)				
ρ	:MEASure:SSCode:TRESult:RHO?	–	<real>	
EVM	:MEASure:SSCode:TRESult:EVM?	–	<real>	
Peak EVM	:MEASure:SSCode:TRESult:PEVM?	–	<real>	
CDP	:MEASure:SSCode:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:MEASure:SSCode:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:MEASure:SSCode:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:MEASure:SSCode:TRESult:SRATe?	–	<real>	
SF	:MEASure:SSCode:TRESult:SF?	–	<int>	
Code No.	:MEASure:SSCode:TRESult:CODE?	–	<int>	
Modulation	:MEASure:SSCode:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Total Result (Specified Code - Specified Code)				
ρ	:MEASure:SCODe:TRESult:RHO?	–	<real>	
EVM	:MEASure:SCODe:TRESult:EVM?	–	<real>	
Peak EVM	:MEASure:SCODe:TRESult:PEVM?	–	<real>	
CDP	:MEASure:SCODe:TRESult:CDP?	–	<real>	

Function description	SCPI command	Parameter	Query reply	Remarks
Timing Offset	:MEASure:SCODe:TRESult:TOFFset?	–	<int>,<int>	
Number Of Average Slot	:MEASure:SCODe:TRESult:AVERage:SLOT?	–	<int>	
Symbol Rate	:MEASure:SCODe:TRESult:SRATe?	–	<real>	
SF	:MEASure:SCODe:TRESult:SF?	–	<int>	
Code No.	:MEASure:SCODe:TRESult:CODE?	–	<int>	
Modulation	:MEASure:SCODe:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Total Result (Specified Code - Specified Slot & Code)				
ρ	:MEASure:SCSLot:TRESult:RHO?	–	<real>	
EVM	:MEASure:SCSLot:TRESult:EVM?	–	<real>	
Peak EVM	:MEASure:SCSLot:TRESult:PEVM?	–	<real>	
CDP	:MEASure:SCSLot:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:MEASure:SCSLot:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:MEASure:SCSLot:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:MEASure:SCSLot:TRESult:SRATe?	–	<real>	
SF	:MEASure:SCSLot:TRESult:SF?	–	<int>	
Code No.	:MEASure:SCSLot:TRESult:CODE?	–	<int>	
Modulation	:MEASure:SCSLot:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Code Domain (All Slot & Code)				
Scrambling Code Number (Dec=Hex)	:MEASure:ASCode:TRESult:SCNumber:DHEX?	–	<int>	
Code Domain (Specified Slot)				
Scrambling Code Number (Dec=Hex)	:MEASure:SSLot:TRESult:SCNumber:DHEX?	–	<int>	
P-CPICH Power				
P-CPICH Power Average [dBm, W, dBc]	:MEASure:PCPICH:TRESult:POWer:AVERage?	–	<real>,<real>,<real>	
P-CPICH Power Maximum [dBm, W, dBc]	:MEASure:PCPICH:TRESult:POWer:MAXimum?	–	<real>,<real>,<real>	
P-CPICH Power Minimum [dBm, W, dBc]	:MEASure:PCPICH:TRESult:POWer:MINimum?	–	<real>,<real>,<real>	
Freq Error Average [Hz, ppm]	:MEASure:PCPICH:TRESult:FERRor:AVERage?	–	<real>,<real>	
Freq Error Maximum [Hz, ppm]	:MEASure:PCPICH:TRESult:FERRor:MAXimum?	–	<real>,<real>	
Carrier Frequency [Hz]	:MEASure:PCPICH:TRESult:CARRier:FREQ?	–	<real>	
Tx Power [dBm, W]	:MEASure:PCPICH:TRESult:POWer?	–	<real>,<real>	
Scrambling Code Number (Dec)	:MEASure:PCPICH:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number (Hex)	:MEASure:PCPICH:TRESult:SCNumber:HEX?	–	#H*****	

Function description	SCPI command	Parameter	Query reply	Remarks
Scrambling Code Number (Dec=Hex)	:MEASure:PCPICH:TRESult:SCNumber:DHEX?	–	<int>	
IPDL				
Power1[dBm]	:MEASure:IPDL:POWer1?	–	<real>	
Power2[dBm]	:MEASure:IPDL:POWer2?	–	<real>	
Ratio[dB]	:MEASure:IPDL:RATio?	–	<real>	
All data[dBm,dBm,dB]	:MEASure:IPDL:ALL?	–	<real>,<real>,<real>	*5

*5: The query reply is output in order of Power1, Power2, and Ratio.

6.3.11 Subsystem-READ

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Concise)				
τ	:READ:CONCise:TRESult:TAU?	–	<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>	
Carrier Frequency Error	:READ:CONCise:TRESult:FERRor?	–	<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>	
EVM	:READ:CONCise:TRESult:EVM?	–	<real>,<real>,<real>,<real>	
Peak CDE	:READ:CONCise:TRESult:PCDE?	–	<real>,<real>,<real>,<real>	
Code Number of PCDE	:READ:CONCise:TRESult:PCDE:NUMBer?	–	<real>,<real>,<real>,<real>	
Tx Power	:READ:CONCise:TRESult:POWer?	–	<real>,<real>,<real>,<real>	
Primary CPICH Power	:READ:CONCise:TRESult:PCPICH:POWer?	–	<real>,<real>,<real>,<real>	
Total Result (ALL Slot & Code)				
ρ	:READ:ASCode:TRESult:RHO?	–	<real>	
τ	:READ:ASCode:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:READ:ASCode:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:READ:ASCode:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:READ:ASCode:TRESult:IQOFfset?	–	<real>	
EVM	:READ:ASCode:TRESult:EVM?	–	<real>	
Peak EVM	:READ:ASCode:TRESult:PEVM?	–	<real>	
Mag. Error	:READ:ASCode:TRESult:MERRor?	–	<real>	
Phase Error	:READ:ASCode:TRESult:PERRor?	–	<real>	
Peak CDE	:READ:ASCode:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:READ:ASCode:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:READ:ASCode:TRESult:POWer?	–	<real>	
Primary CPICH Power	:READ:ASCode:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:READ:ASCode:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:READ:ASCode:TRESult:PSCH:POWer?	–	<real>	

6.3.11 Subsystem-READ

Function description	SCPI command	Parameter	Query reply	Remarks
S-SCH Power	:READ:ASCode:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:READ:ASCode:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:READ:ASCode:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:READ:ASCode:TRESult:ACHannel?	–	<int>	
Number Of Average Slot	:READ:ASCode:TRESult:AVERage:SLOT?	–	<int>	
Total Result (Specified Slot - Specified Slot)				
ρ	:READ:SSLot:TRESult:RHO?	–	<real>	
τ	:READ:SSLot:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:READ:SSLot:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:READ:SSLot:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:READ:SSLot:TRESult:IQOFfset?	–	<real>	
EVM	:READ:SSLot:TRESult:EVM?	–	<real>	
Peak EVM	:READ:SSLot:TRESult:PEVM?	–	<real>	
Mag. Error	:READ:SSLot:TRESult:MERRor?	–	<real>	
Phase Error	:READ:SSLot:TRESult:PERRor?	–	<real>	
Peak CDE	:READ:SSLot:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:READ:SSLot:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:READ:SSLot:TRESult:POWer?	–	<real>	
Primary CPICH Power	:READ:SSLot:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:READ:SSLot:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:READ:SSLot:TRESult:PSCH:POWer?	–	<real>	
S-SCH Power	:READ:SSLot:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:READ:SSLot:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:READ:SSLot:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:READ:SSLot:TRESult:ACHannel?	–	<int>	
P-CPICH Slot Number	:READ:SSLot:TRESult:PCPICH:SLOT?	–	<int>	
Total Result (Specified Slot - Specified Slot & Code)				
ρ	:READ:SSCode:TRESult:RHO?	–	<real>	
EVM	:READ:SSCode:TRESult:EVM?	–	<real>	
Peak EVM	:READ:SSCode:TRESult:PEVM?	–	<real>	
CDP	:READ:SSCode:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:READ:SSCode:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:READ:SSCode:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:READ:SSCode:TRESult:SRATe?	–	<real>	
SF	:READ:SSCode:TRESult:SF?	–	<int>	
Code No.	:READ:SSCode:TRESult:CODE?	–	<int>	
Modulation	:READ:SSCode:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Specified Code - Specified Code)				
ρ	:READ:SCODe:TRESult:RHO?	–	<real>	
EVM	:READ:SCODe:TRESult:EVM?	–	<real>	
Peak EVM	:READ:SCODe:TRESult:PEVM?	–	<real>	
CDP	:READ:SCODe:TRESult:CDP?	–	<real>	
Timing Offset	:READ:SCODe:TRESult:TOFFset?	–	<int>,<int>	
Number Of Average Slot	:READ:SCODe:TRESult:AVERage:SLOT?	–	<int>	
Symbol Rate	:READ:SCODe:TRESult:SRATe?	–	<real>	
SF	:READ:SCODe:TRESult:SF?	–	<int>	
Code No.	:READ:SCODe:TRESult:CODE?	–	<int>	
Modulation	:READ:SCODe:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Total Result (Specified Code - Specified Slot & Code)				
ρ	:READ:SCSLot:TRESult:RHO?	–	<real>	
EVM	:READ:SCSLot:TRESult:EVM?	–	<real>	
Peak EVM	:READ:SCSLot:TRESult:PEVM?	–	<real>	
CDP	:READ:SCSLot:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:READ:SCSLot:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:READ:SCSLot:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:READ:SCSLot:TRESult:SRATe?	–	<real>	
SF	:READ:SCSLot:TRESult:SF?	–	<int>	
Code No.	:READ:SCSLot:TRESult:CODE?	–	<int>	
Modulation	:READ:SCSLot:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Code Domain (All Slot & Code)				
Scrambling Code Number (Dec=Hex)	:READ:ASCode:TRESult:SCNumber:DHEX?	–	<int>	
Code Domain (Specified Slot)				
Scrambling Code Number (Dec=Hex)	:READ:SSLot:TRESult:SCNumber:DHEX?	–	<int>	
P-CPICH Power				
P-CPICH Power Average [dBm, W, dBc]	:READ:PCPICH:TRESult:POWer:AVERage?	–	<real>,<real>, <real>	
P-CPICH Power Maximum [dBm, W, dBc]	:READ:PCPICH:TRESult:POWer:MAXimum?	–	<real>,<real>, <real>	
P-CPICH Power Minimum [dBm, W, dBc]	:READ:PCPICH:TRESult:POWer:MINimum?	–	<real>,<real>, <real>	
Freq Error Average [Hz, ppm]	:READ:PCPICH:TRESult:FERRor:AVERage?	–	<real>,<real>	
Freq Error Maximum [Hz, ppm]	:READ:PCPICH:TRESult:FERRor:MAXimum?	–	<real>,<real>	
Carrier Frequency [Hz]	:READ:PCPICH:TRESult:CARRier:FREQ?	–	<real>	
Tx Power [dBm, W]	:READ:PCPICH:TRESult:POWer?	–	<real>,<real>	
Scrambling Code Number (Dec)	:READ:PCPICH:TRESult:SCNumber:DEC?	–	<int>,<int>	

6.3.11 Subsystem-READ

Function description	SCPI command	Parameter	Query reply	Remarks
Scrambling Code Number (Hex)	:READ:PCPICH:TRESult:SCNumber:HEX?	–	#H*****	
Scrambling Code Number (Dec=Hex)	:READ:PCPICH:TRESult:SCNumber:DHEX?	–	<int>	
IPDL				
Power1[dBm]	:READ:IPDL:POWer1?	–	<real>	
Power2[dBm]	:READ:IPDL:POWer2?	–	<real>	
Ratio[dB]	:READ:IPDL:RATio?	–	<real>	
All data[dBm,dBm,dB]	:READ:IPDL:ALL?	–	<real>,<real>, <real>	*6

*6: The query reply is output in order of Power1, Power2, and Ratio.

6.3.12 Subsystem-FETCh

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Concise) τ	:FETCh:CONCise:TRESult:TAU?	–	<real>,<real>, <real>,<real>, <real>,<real>, <real>,<real>	
Carrier Frequency Error	:FETCh:CONCise:TRESult:FERRor?	–	<real>,<real>, <real>,<real>, <real>,<real>, <real>,<real>	
EVM	:FETCh:CONCise:TRESult:EVM?	–	<real>,<real>, <real>,<real>	
Peak CDE	:FETCh:CONCise:TRESult:PCDE?	–	<real>,<real>, <real>,<real>	
Code Number of PCDE	:FETCh:CONCise:TRESult:PCDE:NUMBer?	–	<real>,<real>, <real>,<real>	
Tx Power	:FETCh:CONCise:TRESult:POWer?	–	<real>,<real>, <real>,<real>	
Primary CPICH Power	:FETCh:CONCise:TRESult:PCPICH:POWer?	–	<real>,<real>, <real>,<real>	
Total Result (ALL Slot & Code) ρ	:FETCh:ASCode:TRESult:RHO?	–	<real>	
τ	:FETCh:ASCode:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:FETCh:ASCode:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:FETCh:ASCode:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:FETCh:ASCode:TRESult:IQOFfset?	–	<real>	
EVM	:FETCh:ASCode:TRESult:EVM?	–	<real>	
Peak EVM	:FETCh:ASCode:TRESult:PEVM?	–	<real>	
Mag. Error	:FETCh:ASCode:TRESult:MERRor?	–	<real>	
Phase Error	:FETCh:ASCode:TRESult:PERRor?	–	<real>	
Peak CDE	:FETCh:ASCode:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:FETCh:ASCode:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:FETCh:ASCode:TRESult:POWer?	–	<real>	
Primary CPICH Power	:FETCh:ASCode:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:FETCh:ASCode:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:FETCh:ASCode:TRESult:PSCH:POWer?	–	<real>	
S-SCH Power	:FETCh:ASCode:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:FETCh:ASCode:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:FETCh:ASCode:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:FETCh:ASCode:TRESult:ACHannel?	–	<int>	
Number Of Average Slot	:FETCh:ASCode:TRESult:AVERage:SLOT?	–	<int>	

Function description	SCPI command	Parameter	Query reply	Remarks
Total Result (Specified Slot - Specified Slot)				
ρ	:FETCh:SSLot:TRESult:RHO?	–	<real>	
τ	:FETCh:SSLot:TRESult:TAU?	–	<real>,<real>	
Carrier Frequency	:FETCh:SSLot:TRESult:CARRier?	–	<real>	
Carrier Frequency Error	:FETCh:SSLot:TRESult:FERRor?	–	<real>,<real>	
IQ Origin Offset	:FETCh:SSLot:TRESult:IQOFfset?	–	<real>	
EVM	:FETCh:SSLot:TRESult:EVM?	–	<real>	
Peak EVM	:FETCh:SSLot:TRESult:PEVM?	–	<real>	
Mag. Error	:FETCh:SSLot:TRESult:MERRor?	–	<real>	
Phase Error	:FETCh:SSLot:TRESult:PERRor?	–	<real>	
Peak CDE	:FETCh:SSLot:TRESult:PCDE?	–	<real>	
Code Number of PCDE	:FETCh:SSLot:TRESult:PCDE:NUMBer?	–	<int>	
Tx Power	:FETCh:SSLot:TRESult:POWer?	–	<real>	
Primary CPICH Power	:FETCh:SSLot:TRESult:PCPICH:POWer?	–	<real>	
SCH Power	:FETCh:SSLot:TRESult:SCH:POWer?	–	<real>	
P-SCH Power	:FETCh:SSLot:TRESult:PSCH:POWer?	–	<real>	
S-SCH Power	:FETCh:SSLot:TRESult:SSCH:POWer?	–	<real>	
Scrambling Code Number(Dec)	:FETCh:SSLot:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number(Hex)	:FETCh:SSLot:TRESult:SCNumber:HEX?	–	#H*****	
Number Of Active Channel	:FETCh:SSLot:TRESult:ACHannel?	–	<int>	
P-CPICH Slot Number	:FETCh:SSLot:TRESult:PCPICH:SLOT?	–	<int>	
Total Result (Specified Slot - Special Slot & Code)				
ρ	:FETCh:SSCode:TRESult:RHO?	–	<real>	
EVM	:FETCh:SSCode:TRESult:EVM?	–	<real>	
Peak EVM	:FETCh:SSCode:TRESult:PEVM?	–	<real>	
CDP	:FETCh:SSCode:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:FETCh:SSCode:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:FETCh:SSCode:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:FETCh:SSCode:TRESult:SRATe?	–	<real>	
SF	:FETCh:SSCode:TRESult:SF?	–	<int>	
Code No.	:FETCh:SSCode:TRESult:CODE?	–	<int>	
Modulation	:FETCh:SSCode:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Total Result (Specified Code - Specified Code)				
ρ	:FETCh:SCODe:TRESult:RHO?	–	<real>	
EVM	:FETCh:SCODe:TRESult:EVM?	–	<real>	
Peak EVM	:FETCh:SCODe:TRESult:PEVM?	–	<real>	
CDP	:FETCh:SCODe:TRESult:CDP?	–	<real>	

Function description	SCPI command	Parameter	Query reply	Remarks
Timing Offset	:FETCh:SCODe:TRESult:TOFFset?	–	<int>,<int>	
Number Of Average Slot	:FETCh:SCODe:TRESult:AVERage:SLOT?	–	<int>	
Symbol Rate	:FETCh:SCODe:TRESult:SRATe?	–	<real>	
SF	:FETCh:SCODe:TRESult:SF?	–	<int>	
Code No.	:FETCh:SCODe:TRESult:CODE?	–	<int>	
Modulation	:FETCh:SCODe:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Total Result (Specified Code - Specified Slot & Code)				
ρ	:FETCh:SCSLot:TRESult:RHO?	–	<real>	
EVM	:FETCh:SCSLot:TRESult:EVM?	–	<real>	
Peak EVM	:FETCh:SCSLot:TRESult:PEVM?	–	<real>	
CDP	:FETCh:SCSLot:TRESult:CDP?	–	<real>,<real>	
Timing Offset	:FETCh:SCSLot:TRESult:TOFFset?	–	<int>,<int>	
P-CPICH Slot Number	:FETCh:SCSLot:TRESult:PCPICH:SLOT?	–	<int>	
Symbol Rate	:FETCh:SCSLot:TRESult:SRATe?	–	<real>	
SF	:FETCh:SCSLot:TRESult:SF?	–	<int>	
Code No.	:FETCh:SCSLot:TRESult:CODE?	–	<int>	
Modulation	:FETCh:SCSLot:TRESult:MODulation?	–	"QPSK"| "16QAM"| "QPSK&16QAM"	
Code Domain (All Slot & Code)				
Scrambling Code Number (Dec=Hex)	:FETCh:ASCode:TRESult:SCNumber:DHEX?	–	<int>	
Code Domain (Specified Slot)				
Scrambling Code Number (Dec=Hex)	:FETCh:SSLot:TRESult:SCNumber:DHEX?	–	<int>	
P-CPICH Power				
P-CPICH Power Average [dBm, W, dBc]	:FETCh:PCPICH:TRESult:POWer:AVERage?	–	<real>,<real>, <real>	
P-CPICH Power Maximum [dBm, W, dBc]	:FETCh:PCPICH:TRESult:POWer:MAXimum?	–	<real>,<real>, <real>	
P-CPICH Power Minimum [dBm, W, dBc]	:FETCh:PCPICH:TRESult:POWer:MINimum?	–	<real>,<real>, <real>	
Freq Error Average [Hz, ppm]	:FETCh:PCPICH:TRESult:FERRor:AVERage?	–	<real>,<real>	
Freq Error Maximum [Hz, ppm]	:FETCh:PCPICH:TRESult:FERRor:MAXimum?	–	<real>,<real>	
Carrier Frequency [Hz]	:FETCh:PCPICH:TRESult:CARRier:FREQ?	–	<real>	
Tx Power [dBm, W]	:FETCh:PCPICH:TRESult:POWer?	–	<real>,<real>	
Scrambling Code Number (Dec)	:FETCh:PCPICH:TRESult:SCNumber:DEC?	–	<int>,<int>	
Scrambling Code Number (Hex)	:FETCh:PCPICH:TRESult:SCNumber:HEX?	–	#H*****	

Function description	SCPI command	Parameter	Query reply	Remarks
Scrambling Code Number (Dec=Hex)	:FETCh:PCPICH:TRESult:SCNumber:DHEX?	–	<int>	
IPDL				
Power1[dBm]	:FETCh:IPDL:POWer1?	–	<real>	
Power2[dBm]	:FETCh:IPDL:POWer2?	–	<real>	
Ratio[dB]	:FETCh:IPDL:RATio?	–	<real>	
All data[dBm,dBm,dB]	:FETCh:IPDL:ALL?	–	<real>,<real>, <real>	*7

*7: The query reply is output in order of Power1, Power2, and Ratio.

6.3.13 Subsystem-DIAGnostic

Function description	SCPI command	Parameter	Query reply	Remarks
DIAGnostic				
Reading Power on DIAG result	:DIAGnostic:PON?	–	PASS|FAIL	

6.3.14 Subsystem-STATus

Function description	SCPI command	Parameter	Query reply	Remarks
STATus				
Standard Operation Enable Register setting	:STATus:OPERation:ENABle	<int>	<int>	
Reading Standard Operation Event Register	:STATus:OPERation:EVENt?	–	<int>	
Questionable Enable Register setting	:STATus:QUEStionable:ENABle	<int>	<int>	
Reading Questionable Event Register	:STATus:QUEStionable:EVENt?	–	<int>	
Measuring Enable Register setting	:STATus:OPERation:MEASure:ENABle	<int>	<int>	
Reading Measuring Event Register	:STATus:OPERation:MEASure:EVENt?	–	<int>	

6.3.15 Subsystem-HCOPy

Function description	SCPI command	Parameter	Query reply	Remarks
HCOPy				
Printing to the file or printer	:HCOPy[:IMMediate]	–	–	
Specifying the output destination (file or printer)	:HCOPy:DESTination	MMEMory|PRINt	MMEM|PRIN	
Specifying the output file number	:HCOPy:MMEMory:FILE:NUMBer	<int>	<int>	
Specifying the output file type	:HCOPy:MMEMory:FILE:TYPE	BITMap|PNGraphic	BITM|PNG	

6.4 Status Register

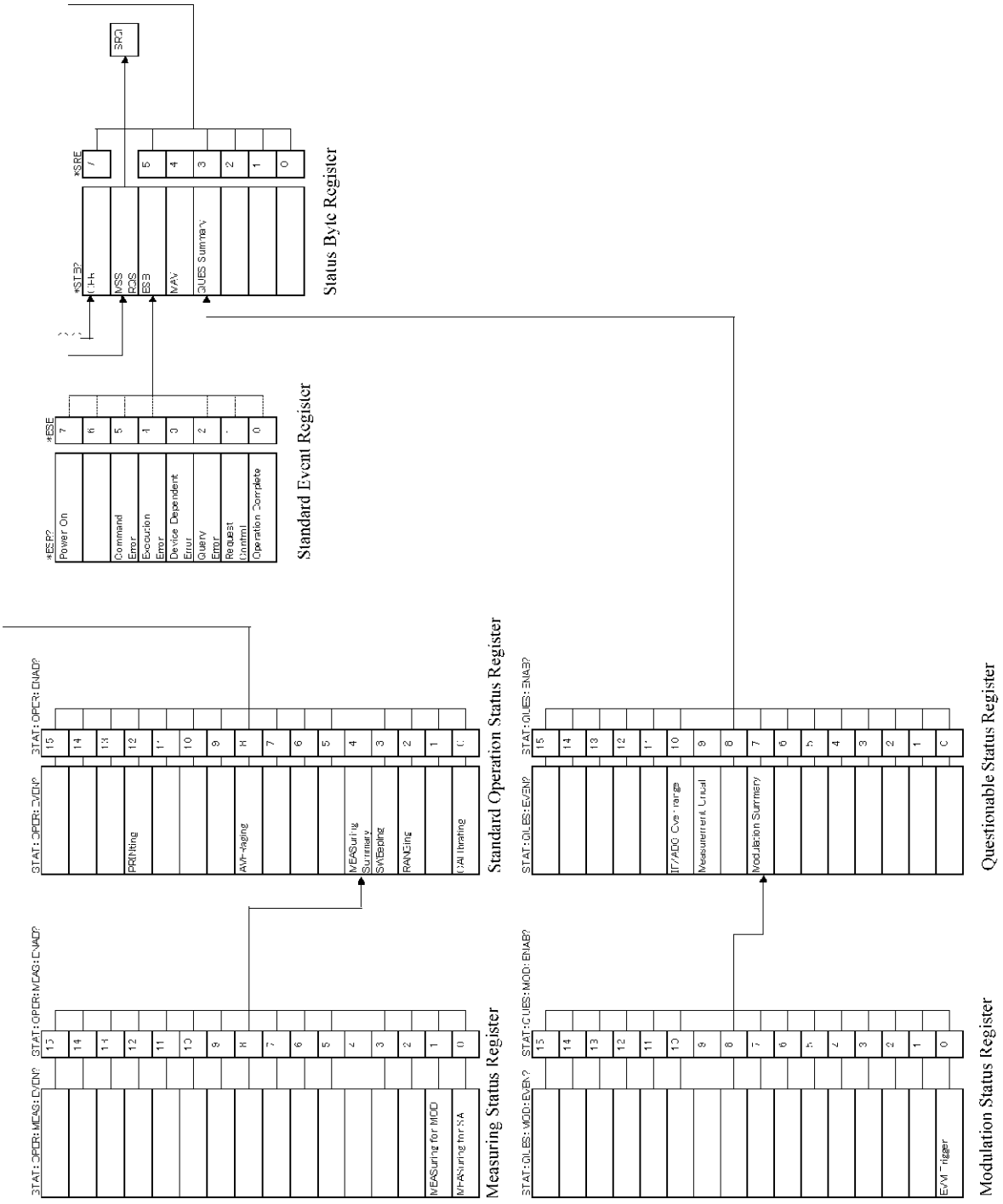


Figure 6-1 Status Registers

7. PERFORMANCE VERIFICATION(Downlink)

This chapter describes how to verify whether this instrument meets the specified performance.

It is recommended that you copy the test data record sheet included in the last of this chapter and save it as a record of the performance test.

IMPORTANT: Before executing the performance verification, execute warm-up and all calibrations.

7.1 Test Signal Specifications

The test signals used for performance verification are shown below:

Table 7-1 Test Signal Specifications (1 of 2)

No.	Test signal name	Signal specifications	Test item
1	Base station signal 1 Single carrier	Scrambling Code No.: 0 Active channel: TestModel1 DPCH64codes (3GPP Standard: Based on TS25.141 V5.7.0)	RF input Downlink measurement IQ input Downlink measurement
2	Base station signal 2 Single carrier	Scrambling Code No.: 0 Active channel: TestModel5 DPCH30codes (3GPP Standard: Based on TS25.141 V5.7.0)	RF input Downlink measurement IQ input Downlink measurement
3	Base station signal 3 Multi carrier	Scrambling Code No.: 0 Active channel: TestModel1 DPCH64codes (3GPP Standard: Based on TS25.141 V5.7.0) Number of carriers: 4 Frequency offset: -7.5 MHz, -2.5 MHz, 2.5 MHz, 7.5 MHz Transmission timing: 0 chip, 512 chip delay, 1024 chip delay, 1536 chip delay Power ratio for each carrier: 0 dB	RF input Downlink measurement IQ input Downlink measurement

Table 7-1 Test Signal Specifications (2 of 2)

No.	Test signal name	Signal specifications	Test item
4	Base station signal 4 Multi carrier	Scrambling Code No.: 0 Active channel: TestModel5 DPCH30codes (3GPP Standard: Based on TS25.141 V5.7.0) Number of carriers: 4 Frequency offset: -7.5 MHz, -2.5 MHz, 2.5 MHz, 7.5 MHz Transmission timing: 0 chip, 512 chip delay, 1024 chip delay, 1536 chip delay Power ratio for each carrier: 0 dB	RF input Downlink measurement IQ input Downlink measurement

7.2 Test Procedures

This section describes the procedures of each test item.

7.2.1 RF Input Base Station Signal Measurement

Connect the signal source as shown below:

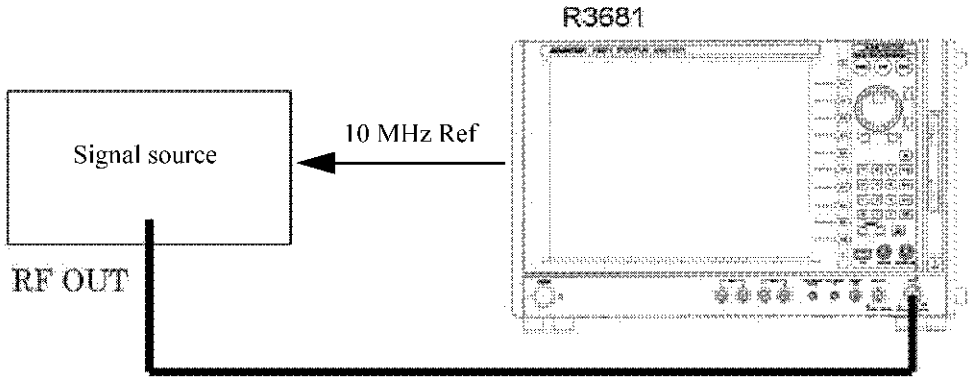


Figure 7-1 Connection Diagram of Signal Source

7.2.1.1 Single Carrier Measurement

1. Base station signal 1 (base station signal 2), which has a carrier frequency of 800 MHz (2 GHz) and a level of -10 dBm (-20 dBm), is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}: **Code Domain**

{MEAS SETUP}: **Meas Parameters**

Meas Band Width:	Multi Carrier (Single Carrier)
Setup Carrier:	1st Carrier
Parameters	
[Carrier Frequency Offset]:	0
[Scrambling Code Define]:	UNDEFINE
[Active CH Detection]:	TestModel1 DPCH64codes
	(TestModel5 DPCH30codes)
[SCH]:	ON
[Threshold]:	-30 dB
Equalizing Filter:	NOT USE
Code Domain Setup	
[Meas Carrier]:	1st
[Analysis Rate]:	7.5 ksps

	[Meas Length]		1SLOT
{INPUT}:	**Input**	RF	
{TRIGGER}:	**Trigger Source**	Free Run	
{LEVEL}:	Execute **Auto Level Set**		
{FREQ}:	**Center**	800 MHz (2 GHz)	

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

7.2.1.2 Multi Carrier Measurement

1. Base station signal 3 (base station signal 4), which has a carrier frequency of 800 MHz (2 GHz) and a level per carrier of -10 dBm (-20 dBm), is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}: **Code Domain**

{MEAS SETUP}: **Meas Parameters**

Meas Band Width:	Multi Carrier (Single Carrier)
Setup Carrier:	1st Carrier
Parameters	
[Carrier Frequency Offset]:	-7.5 MHz, -2.5 MHz, 2.5 MHz, 7.5 MHz
[Scrambling Code Define]:	UNDEFINE
[Active CH Detection]:	TestModel1 DPCH64codes (TestModel5 DPCH30codes)
[SCH]:	ON
[Threshold]:	-30 dB
Equalizing Filter:	NOT USE
Code Domain Setup	
[Meas Carrier]:	1st
[Analysis Rate]:	7.5 ksps
[Meas Length]:	1SLOT

{INPUT}:	**Input**	RF	
{TRIGGER}:	**Trigger Source**	Free Run	
{LEVEL}:	Execute **Auto Level Set**		
{FREQ}:	**Center**	800 MHz (2 GHz)	

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

7.2.2 IQ Input Base Station Signal Measurement

Connect the signal source as shown below:

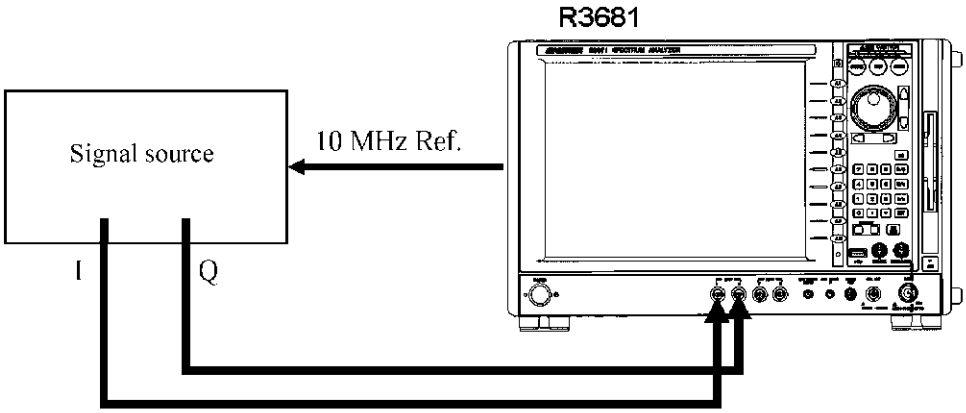


Figure 7-2 Connection Diagram of Signal Source (IQ Input)

7.2.2.1 Single Carrier Measurement

1. The base band signal of base station signal 1 (base station signal 2) is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}: **Code Domain**

{MEAS SETUP}: **Meas Parameters**

Meas Band Width:	Multi Carrier (Single Carrier)
Setup Carrier:	1st Carrier
Parameters	
[Carrier Frequency Offset]:	0
[Scrambling Code Define]:	UNDEFINE
[Active CH Detection]:	TestModel1 DPCH64codes (TestModel5 DPCH30codes)
[SCH]:	ON
[Threshold]:	-30 dB
Equalizing Filter:	NOT USE
Code Domain Setup	
[Meas Carrier]:	1st
[Analysis Rate]:	7.5 ksps
[Meas Length]:	1SLOT

{INPUT}:	**Input**	Baseband(I&Q)
	Baseband Input	AC
{TRIGGER}:	**Trigger Source**	Free Run

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

7.2.2.2 Multi Carrier Measurement

1. The base band signal of base station signal 3 (base station signal 4) is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}:	**Code Domain**		
{MEAS SETUP}:	**Meas Parameters**		
	Meas Band Width:		Multi Carrier
	Setup Carrier:		1st Carrier
	Parameters		
	[Carrier Frequency Offset]:		-7.5 MHz, -2.5 MHz, 2.5 MHz, 7.5 MHz
	[Scrambling Code Define]:		UNDEFINE
	[Active CH Detection]:		TestModel1 DPCH64codes (TestModel5 DPCH30codes)
	[SCH]:		ON
	[Threshold]:		-30 dB
	Equalizing Filter:		NOT USE
	Code Domain Setup		
	[Meas Carrier]:		1st
	[Analysis Rate]:		7.5 ksps
	[Meas Length]:		1SLOT
{INPUT}:	**Input**	Baseband(I&Q)	
	Baseband Input	AC	
{TRIGGER}:	**Trigger Source**	Free Run	

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

7.3 Test Data Record Sheet

Test data record sheet

Model name:

Serial number:

1. RF Input Single Carrier Measurement (carrier frequency: 800 MHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-55dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	
Transmission power	-10.8 dBm		-9.2 dBm	

2. RF Input Single Carrier Measurement (carrier frequency: 2 GHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.0%rms	
PeakCDE measurement	None		-55 dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	
Transmission power	-10.8 dBm		-9.2 dBm	

3. RF Input Multi Carrier Measurement (carrier frequency: 800 MHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-20.0 Hz		20.0 Hz	
EVM measurement	None		2.0%rms	
PeakCDE measurement	None		-50 dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	
Transmission power	-10.9 dBm		-9.1 dBm	

4. RF Input Multi Carrier Measurement (carrier frequency: 2 GHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-20.0 Hz		20.0 Hz	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-50 dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	
Transmission power	-10.9 dBm		-9.1 dBm	

5. IQ Input Single Carrier Measurement

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
EVM measurement	None		1.0%rms	
PeakCDE measurement	None		-55 dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	

6. IQ Input Multi Carrier Measurement

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-50 dB	
CDP relative value measurement (for -10 dBc code)	-9.97 dB		-10.03 dB	

8. SPECIFICATIONS(Downlink)

8.1 3GPP Modulation Analysis Compliance System

3rd Generation Partnership Project (3GPP)

Technical Specification

TS 25.211 V5.5.0

TS 25.213 V5.4.0

In compliance with

8.2 3GPP Modulation Analysis Performance

Conditions

<table>
<tr><th>Item</th><th>Conditions</th></tr>
<tr><td>Temperature range</td><td>+20°C to +30°C</td></tr>
<tr><td>Signal
Single carrier
Multi carrier

Power per carrier
EVM</td><td>
TestModel1 DPCH64codes, TestModel5 DPCH30codes
TestModel1 DPCH64codes of 4 carriers
TestModel5 DPCH30codes of 4 carriers
<table><tr><td>Carrier configuration</td><td>1st</td><td>2nd</td><td>3rd</td><td>4th</td></tr><tr><td>Frequency offset [MHz]</td><td>-7.5</td><td>-2.5</td><td>2.5</td><td>7.5</td></tr><tr><td>Transmission timing [chip]</td><td>0</td><td>512</td><td>1024</td><td>1536</td></tr><tr><td>Power [dB]</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>
-10 dBm, -20 dBm
0%rms</td></tr>
<tr><td>Measurement mode</td><td>Concise, Code Domain</td></tr>
</table>

In the single carrier

Item	Conditions
Carrier frequency error	For a center frequency of 800 MHz or 2 GHz
Measurement range	<±1 kHz
Measurement accuracy	<± (Measurement accuracy × Carrier frequency + 5 Hz)
EVM	
Residual EVM	<1.5%rms for a center frequency of 800 MHz <1.0%rms for a center frequency of 2 GHz or IQ input
Peak CDE	For a center frequency of 800 MHz or 2 GHz or for IQ input
Measurement accuracy	<-55 dB
CDP relative value error	For a center frequency of 800 MHz or 2 GHz, IQ input, or -10 dBc code
Measurement accuracy	<±0.03 dB
Transmission power	
Measurement accuracy	<± (0.2 + Frequency response + calibration signal level accuracy) dB Frequency response 50 MHz to 2.5 GHz <±0.4 dB 20 Hz to 3.5 GHz <±1.0 dB Calibration signal level accuracy<±0.2 dB

In the multi carrier

Item	Conditions
Carrier frequency error	For a center frequency of 800 MHz or 2 GHz
Measurement range	<±1 kHz
Measurement accuracy	<± (Measurement accuracy × Carrier frequency + 20 Hz)
EVM	
Residual EVM	<2.0%rms for a center frequency of 800 MHz <1.5%rms for a center frequency of 2 GHz or IQ input
Peak CDE	For a center frequency of 800 MHz or 2 GHz or for IQ input
Measurement accuracy	<-50 dB
CDP relative value error	For a center frequency of 800 MHz or 2 GHz, IQ input, or -10 dBc code
Measurement accuracy	<±0.03 dB
Transmission power	
Measurement accuracy	<± (0.3 + Frequency response + calibration signal level accuracy) dB Frequency response 50 MHz to 2.5 GHz <±0.4 dB 20 Hz to 3.5 GHz <±1.0 dB Calibration signal level accuracy<±0.2 dB

9. MEASUREMENT EXAMPLES(Uplink)

This chapter describes how to use this option by using specific measurement examples.

9.1 3GPP Mobile Station Signal Measurement

Signal Specifications

The target is the signal in the 3GPP system test unit and is output with the following specifications.

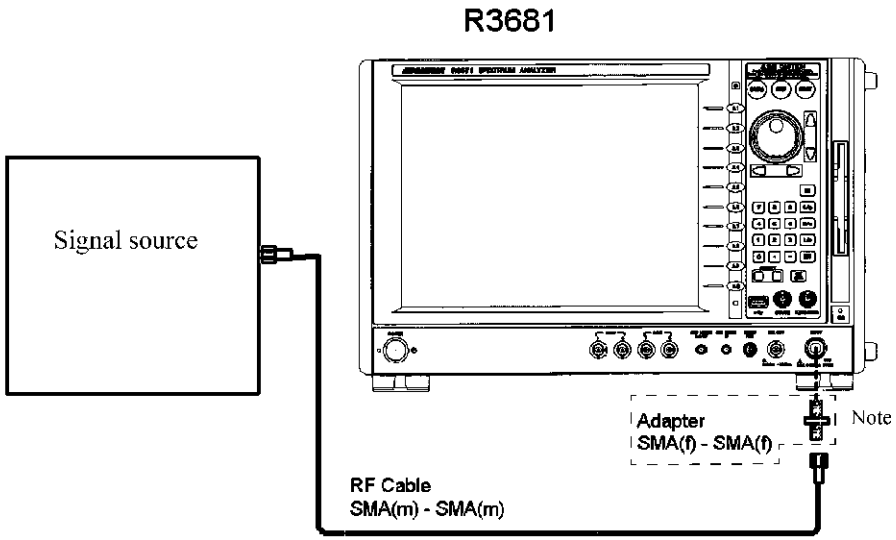
Table 9-1 Signal Specifications

Carrier frequency	1.9 GHz				
Level	-10 dBm				
Scrambling Code No.	1				
Active channel	DPCCH	15 ksps	No.0	Q	-5.46 dB
	DPDCH	60 ksps	No.16	I	0.00 dB

9.1.1 3GPP Mobile Station Signal Measurements Using the Concise Mode

The numerical results such as Error Vector Magnitude can be measured by using the Concise Mode. The following shows measurement examples:

Connection



Note: The R3671 uses the N(m)-SMA(f) adapter.

Figure 9-1 Connection Diagram Using the Concise Mode

Measurement condition setting

1. Touch **[Config]** on the menu bar and select **[Modulation Analyzer]**.
2. Touch **|Modulation|** on the menu bar and select **[3GPP UL|**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **1**, **.**, **9** and **G/p** on the keypad.
   The center frequency is set to 1.9 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.
10. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
11. Set the **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.

12. Touch the close button [×] in the **[Input Setup]** dialog box to close the dialog box.

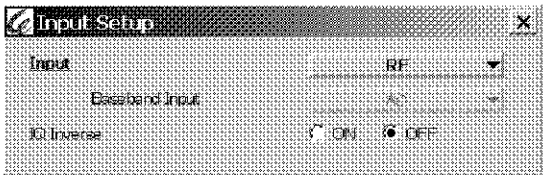


Figure 9-2 **[Input Setup]** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **Concise** key on the soft menu bar.
    The Measurement mode is set to the Concise mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **|Measurement Parameters Setup|** dialog box appears.
19. Touch the **|Scrambling Code No.|** text box and press [1] and [ENT] on the keypad.
    The Scrambling Code number is set to 1.
20. Touch the **|Excluding chips in slot boundary|** text box and press [9], [6] on the numeric keypad, and [ENT].
    The length of the chips in the first and last parts of the slot, which are excluded from the measurement range, is set to "96 chips".
21. Touch the **|Threshold|** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.

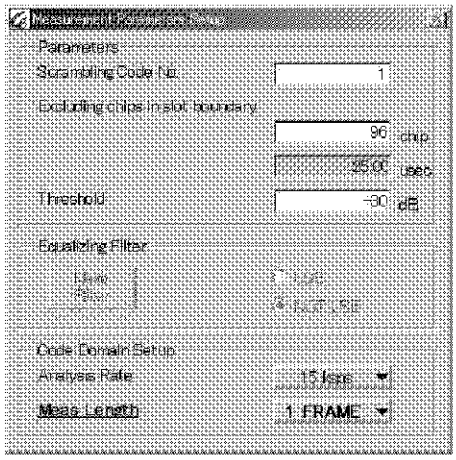


Figure 9-3 **[Measurement Parameters Setup]** Dialog Box

22. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

23. Push the **SINGLE** button on the front panel.
    The Single measurement is executed, and the measurement results are displayed.

Figure 9-4 Concise Mode Measurement Results

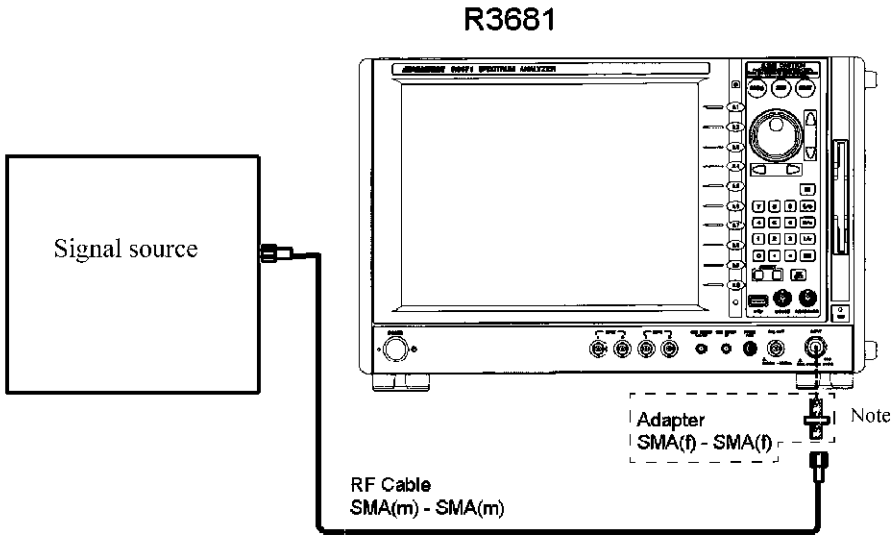
Frequency Error	Carrier frequency error (Hz, ppm)
EVM	Error Vector Magnitude (%rms)
Peak CDE	Peak code domain error (dB)
Code No. of PCDE	Code number of the Peak CDE

I or Q of PCDE	I or Q of the Peak CDE
Tx Power	Transmission power (dBm)

9.1.2 3GPP Mobile Station Signal Measurements Using the Code Domain Mode

The Code Domain Power etc. can be measured by using the Code Domain Mode. The following shows the measurement examples:

Connection



Note: The R3671 uses the N(m)-SMA(f) adapter.

Figure 9-5 Connection Diagram Using the Code Domain Mode

Measurement condition setting

1. Touch **|Config|** on the menu bar and select **|Modulation Analyzer|**.
2. Touch **[Modulation]** on the menu bar and select **[3GPP UL]**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **1**, **.**, **9** and **G/p** on the keypad.
   The center frequency is set to 1.9 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.

10. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
11. Set the **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.
12. Touch the close button ✕ in the **[Input Setup]** dialog box to close the dialog box.

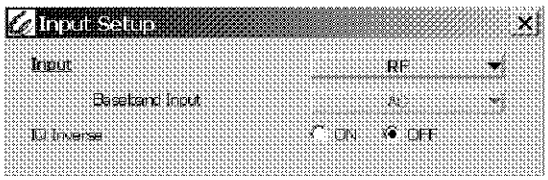


Figure 9-6 **[Input Setup]** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **Code Domain** key on the soft menu bar.
    The Measurement mode is set to the Code Domain mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.
19. Touch the **[Scrambling Code No.]** text box and press 1 and ENT on the keypad.
    The Scrambling Code number is set to 1.
20. Touch the **[Excluding chips in slot boundary]** text box and press 9, 6 on the numeric keypad, and ENT.
    The length of the chips in the first and last parts of the slot, which are excluded from the measurement range, is set to "96 chips".
21. Touch the **[Threshold]** text box and press -, 3, 0 and ENT on the keypad.
    The Threshold level is set to -30 dB.
22. Set the **[Analysis Rate]** option button to **[15 ksps]**.
    The symbol rate to be analyzed is set to 15 ksps.
23. Set the **[Meas Length]** option button to **[1 FRAME]**.
    The Measurement length is set to 1 frame.

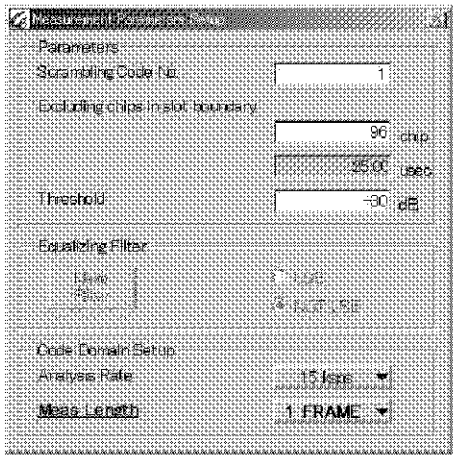


Figure 9-7 **[Measurement Parameters Setup]** Dialog Box

24. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

25. Push the **SINGLE** button on the front panel.
The Single measurement is executed, and the measurement results are displayed.

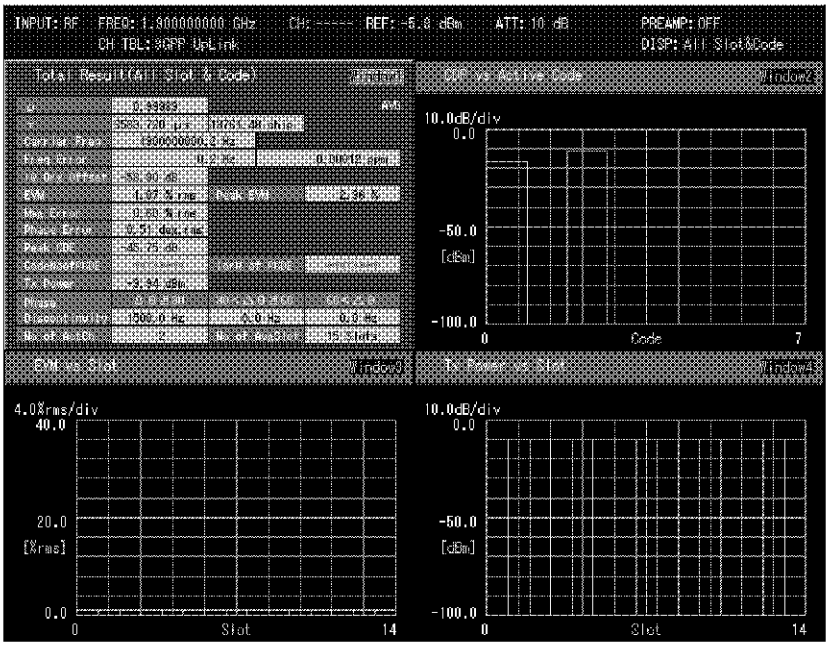


Figure 9-8 Code Domain Mode Measurement Results

Upper left window

ρ	Waveform quality
τ	Delay (μs, chip)
Carrier Freq	Carrier frequency (Hz)
Freq Error	Carrier frequency error (Hz, ppm)
IQ Org Offset	IQ origin offset (dB)
EVM	Error Vector Magnitude (%rms)
Peak EVM	Peak Error Vector Magnitude (%)
Mag. Error	Magnitude error (%rms)
Phase Error	Phase error (deg.rms)
Peak CDE	Peak code domain error (dB)
Code No. of PCDE	Code number of the Peak CDE
I or Q of PCDE	I or Q of the Peak CDE
Tx Power	Transmission power (dBm)
Phase Discontinuity	Discontinuity between the slots (Hz)
No. of ActCh	Number of active channels
No. of Avg Slot	Number of average slot (Slots)

Upper right window

Horizontal axis - Code

Vertical axis - Code domain power (dBm)

Upper left window

Horizontal axis - Slot

Vertical axis - Error Vector Magnitude (%rms)

Lower right window

Horizontal axis - Slot

Vertical axis - Transmission power (dBm)

9.1.3 EVM Measurement of the DUT by Using the Equalizing Filter

The EVM of the DUT such as amplifiers or filters can be measured with the cancellation of the signal source frequency characteristics by using the Equalizing Filter function. An example, which is measured by using the Equalizing Filter function is shown below.

Signal source

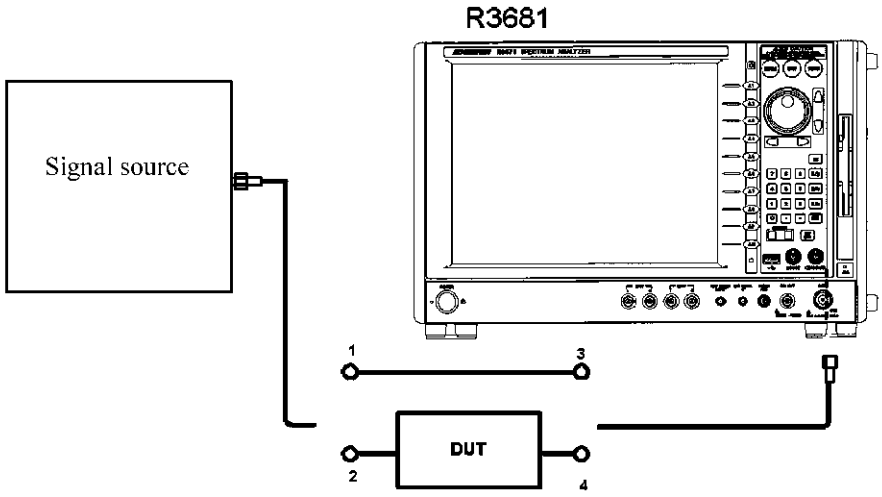


Figure 9-9 Connection Diagram Using the Equalizing Filter

Measurement condition setting

1. Connect the instruments to the 1-3 path.
2. Touch **[Config]** on the menu bar and select **[Modulation Analyzer]**.
3. Touch **[Modulation]** on the menu bar and select **[3GPP UL]**.
4. Touch the **{FREQ}** button on the function bar.
5. Touch the **Center** key on the soft menu bar.
6. Press [1], [.], [9] and [G/p] on the keypad.
   The center frequency is set to 1.9 GHz.
7. Touch the **{TRIGGER}** button on the function bar.
8. Touch the **Trigger Source** key on the soft menu bar.
9. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.

10. Touch the **{INPUT}** button on the function bar.
11. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
12. Set **[Input]** in the **[Input Setup]** dialog box to **[RF]**.
    The Input mode is set to RF.
13. Touch the close button ✕ in the **[Input Setup]** dialog box to close the dialog box.

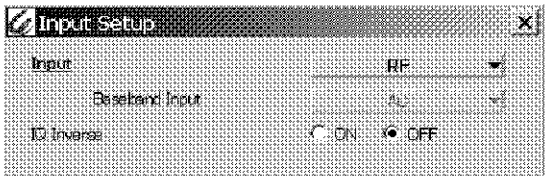


Figure 9-10 **[Input Setup]** Dialog Box

14. Touch the **{LEVEL}** button on the function bar.
15. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
16. Touch the **{MEAS MODE}** button on the function bar.
17. Touch the **Code Domain** key on the soft menu bar.
    The Measurement mode is set to the Code Domain mode.
18. Touch the **{MEAS SETUP}** button on the function bar.
19. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.
20. Touch the **[Scrambling Code No.]** text box and press [1] and [ENT] on the keypad.
    The Scrambling Code number is set to 1.
21. Touch the **[Excluding chips in slot boundary]** text box and press [9], [6] on the numeric keypad, and [ENT].
    The length of the chips in the first and last parts of the slot, which are excluded from the measurement range, is set to "96 chips".
22. Touch the **[Threshold]** text box and press [-], [3], [0] and [ENT] on the keypad.
    The Threshold level is set to -30 dB.
23. Set the **[Analysis Rate]** option button to **[15 ksps]**.
    The symbol rate to be analyzed is set to 15 ksps.

24. Set the **[Meas Length]** option button to **[1 FRAME]**.
    The Measurement length is set to 1 frame.

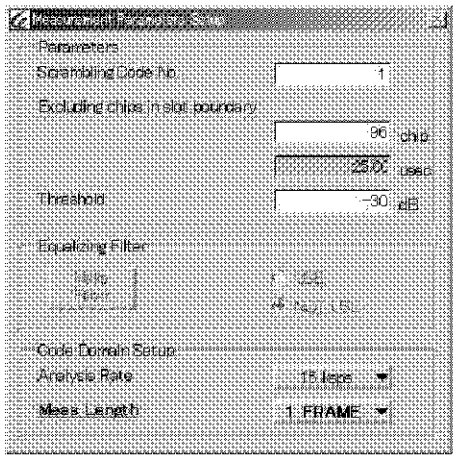


Figure 9-11 **[Measurement Parameters Setup]** Dialog Box

25. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

26. Push the **SINGLE** button on the front panel.
    The Single measurement is executed, and the measurement results are displayed. Verify that the EVM in the upper left window (Total Result) is 17.5% or less.

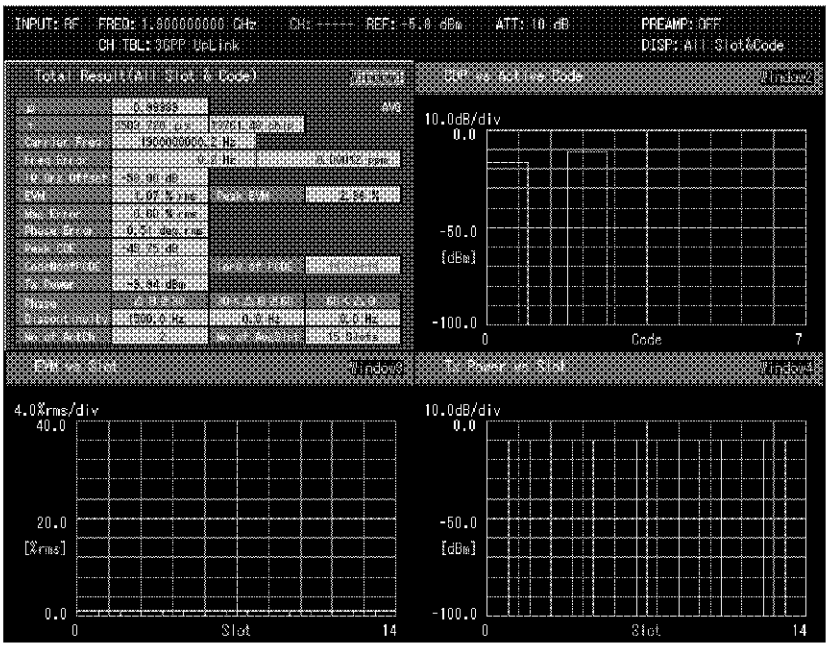


Figure 9-12 Measurement Results of the Code Domain Mode

27. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.

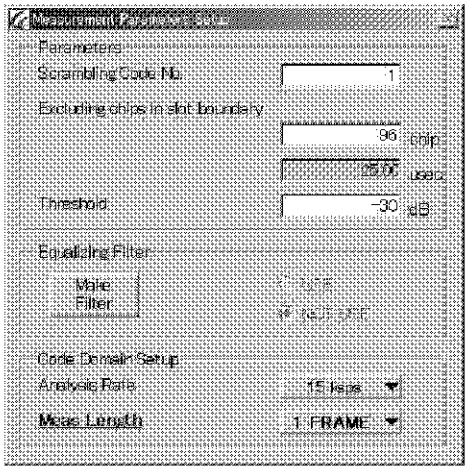


Figure 9-13 **[Measurement Parameters Setup]** Dialog Box

28. Press the **[Make Filter]** button.
    The Equalizing Filter coefficient is created.

29. Connect the instruments to the 2-4 path.

30. Touch the **[USE]**.
    The mode, which uses the Equalizing Filter coefficient, is set.

31. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

32. Push the **SINGLE** button on the front panel.
    The Single measurement is executed, and the measurement results of the DUT, which are processed by the Equalizer, are displayed.

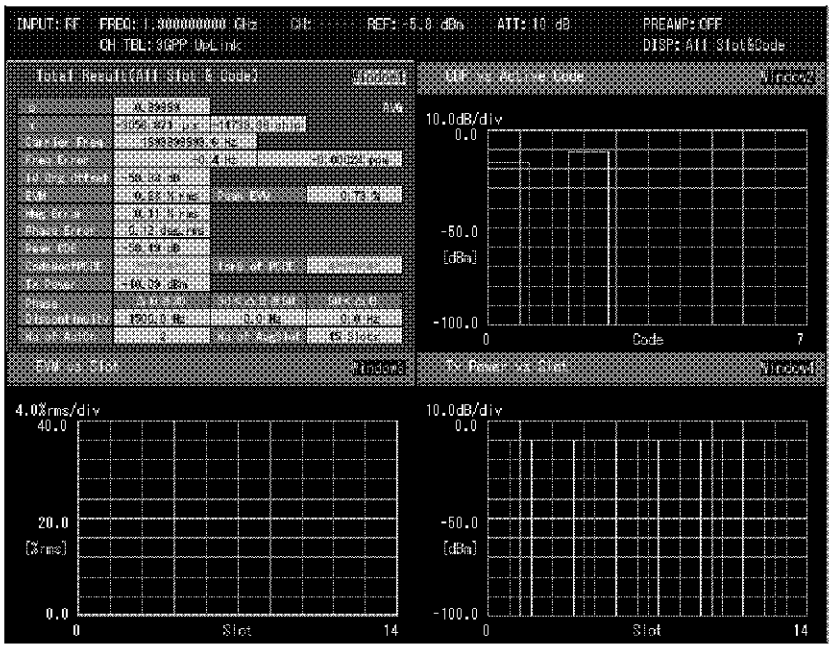


Figure 9-14 Measurement Results of the DUT

Upper left window

ρ	Waveform quality
τ	Delay (μs, chip)
Carrier Freq	Carrier frequency (Hz)
Freq Error	Carrier frequency error (Hz, ppm)
IQ Org Offset	IQ origin offset (dB)
EVM	Error Vector Magnitude (%rms)
Peak EVM	Peak Error Vector Magnitude (%)
Mag. Error	Magnitude error (%rms)
Phase Error	Phase error (deg.rms)
Peak CDE	Peak Code Domain Error (dB)
Code No. of PCDE	Code number of the Peak CDE
I or Q of PCDE	I or Q of the Peak CDE
Tx Power	Transmission power (dBm)
Phase Discontinuity	Discontinuity between the slots (Hz)
No. of ActCh	Number of active channels
No. of Avg Slot	Number of average slot (Slots)

Upper right window

Horizontal axis - Code

Vertical axis - Code Domain Power (dBm)

Lower left window

Horizontal axis - Slot

Vertical axis - Error Vector Magnitude (%rms)

Lower right window

Horizontal axis - Slot

Vertical axis - Transmission power (dBm)

9.2 QPSK Signal Measurement

Signal Specifications

The measured signal is output with the following specifications.

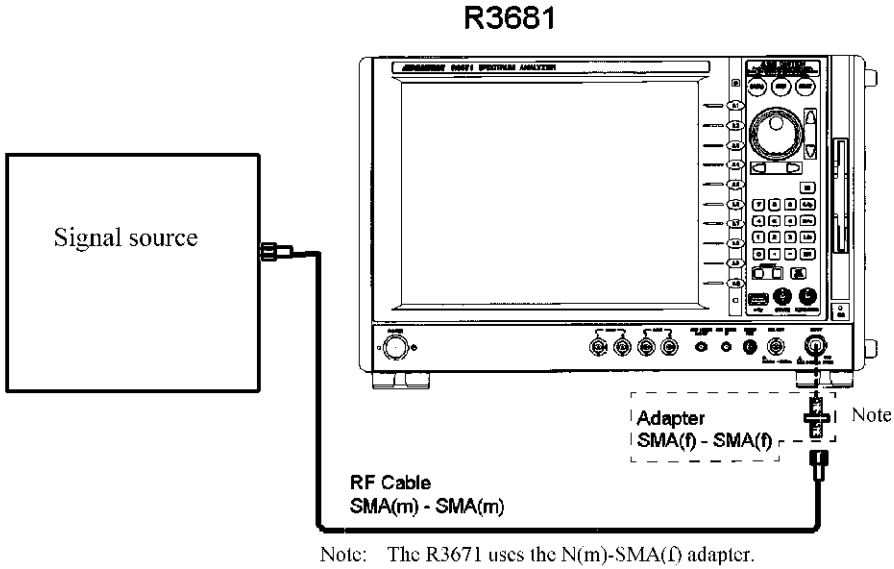
Table 9-2 Signal Specifications

Carrier frequency	1.9 GHz
Level	-10 dBm
Modulation format	QPSK
Transmission filter	Root Nyquist filter with a roll-off factor of 0.22
Chip rate	3.84 Mcps

9.2.1 QPSK Signal Measurements Using the QPSK Mode

If the QPSK mode is used, Error Vector Magnitude can be measured. The following shows an example of the QPSK signal measurement that is performed when the measurement length is set to 2560 chips.

Connection



Note: The R3671 uses the N(m)-SMA(f) adapter.

Figure 9-15 Connection Diagram Using the QPSK Mode

Measurement condition setting

1. Touch **[Config]** on the menu bar and select **|Modulation Analyzer|**.
2. Touch **[Modulation]** on the menu bar and select **[3GPP UL]**.
3. Touch the **{FREQ}** button on the function bar.
4. Touch the **Center** key on the soft menu bar.
5. Press **1**, **.**, **9** and **G/p** on the keypad.
   The center frequency is set to 1.9 GHz.
6. Touch the **{TRIGGER}** button on the function bar.
7. Touch the **Trigger Source** key on the soft menu bar.
8. Touch the **Free Run** key on the soft menu bar.
   The trigger source is set to the internal trigger.
9. Touch the **{INPUT}** button on the function bar.
10. Touch the **Input Setup** key on the soft menu bar.
    The **[Input Setup]** dialog box appears.
11. Set the **|Input|** in the **|Input Setup|** dialog box to **|RF|**.
    The Input mode is set to RF.
12. Touch the close button ✕ in the **[Input Setup]** dialog box to close the dialog box.

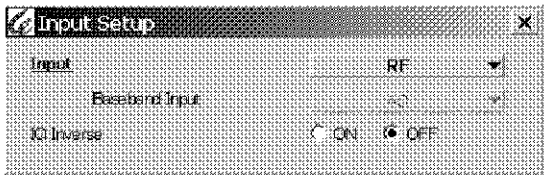


Figure 9-16 **|Input Setup|** Dialog Box

13. Touch the **{LEVEL}** button on the function bar.
14. Touch the **Auto Level Set** key on the soft menu bar.
    The Ref Level is automatically set to the optimum value.
15. Touch the **{MEAS MODE}** button on the function bar.
16. Touch the **QPSK** key on the soft menu bar.
    The Measurement mode is set to the QPSK mode.
17. Touch the **{MEAS SETUP}** button on the function bar.
18. Touch the **Meas Parameters** key on the soft menu bar.
    The **[Measurement Parameters Setup]** dialog box appears.

19. Set the **[Signal Type]** option button to **[QPSK]**.
    The modulation format to be analyzed is set to QPSK.

20. Touch the **[Meas Length]** text box and press **2**, **5**, **6**, **0** and **ENT** on the keypad.
    The measurement length is set to 2560 chips.

21. Touch **[ON]** of **[Root Nyquist Filter]**.
    The mode, in which the analysis is performed by using the Root Nyquist filter, is set.

22. Set the **[IQ Origin Offset]** option button to **[INCLUDE]**.
    The mode, in which the analysis is performed including the IQ origin offset, is set.

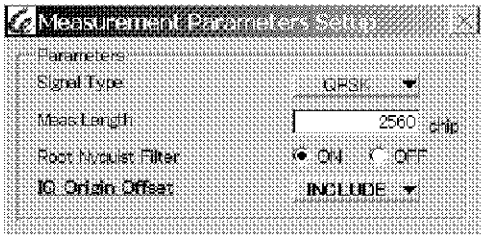


Figure 9-17 **[Measurement Parameters Setup]** Dialog Box

23. Touch the **Return** key on the soft menu bar to close the **[Measurement Parameters Setup]** dialog box.

24. Push the **SINGLE** button on the front panel.
    The Single measurement is executed, and the measurement results are displayed.

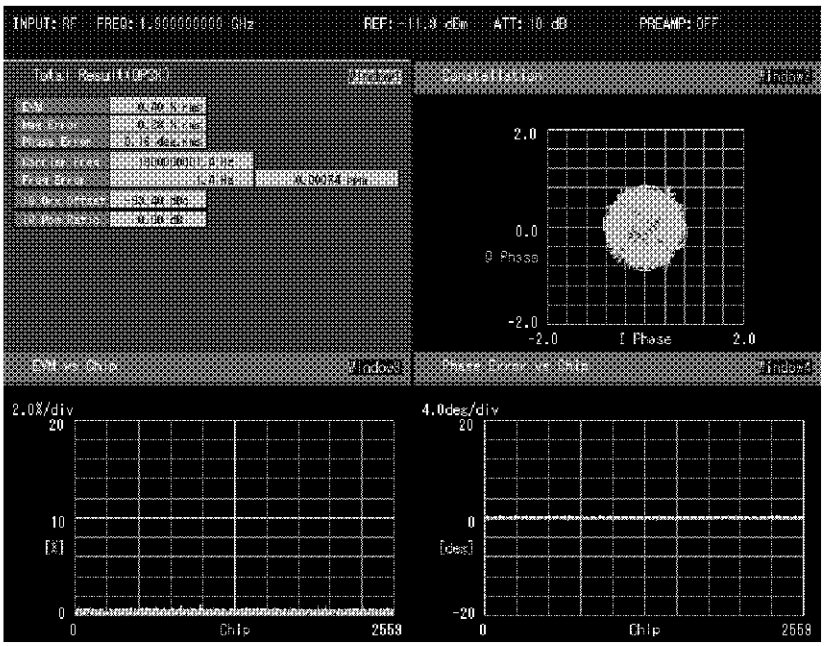


Figure 9-18 Measurement Results of the QPSK Mode

Upper left window

EVM	Error vector magnitude (%rms)
Mag. Error	Magnitude error (%rms)
Phase Error	Phase error (deg.rms)
Carrier Freq	Carrier frequency (Hz)
Freq Error	Carrier frequency error (Hz, ppm)
IQ Org Offset	IQ origin offset (dB)
IQ Power Ratio	IQ power ratio (dB)

Upper right window

Constellation

Lower left window

Horizontal axis:	Chip
Vertical axis:	Error Vector Magnitude (%)

Lower right window

Horizontal axis:	Chip
Vertical axis:	Phase error (deg.)

10. MENU MAP, FUNCTIONAL EXPLANATION(Uplink)

This chapter describes the configurations and functions of the soft keys displayed on the touch screen of the 3GPP modulation analysis option.

MEMO:

- *[.....] Used to enclose a menu name, key name, item name in the dialog box, button name, or the name of selected items in lists and menus.*
- *{....} Shows a function button on the function bar.*
- *Shows a soft key on the soft menu bar.*
- *A dialog box is surrounded by a broken line.*
- *Operations are supposed to be made through the touch screen and "touch" means to press a button or a key.*

10.1 Menu Index

10.2 Switching Communication Systems

The menu bar of this option is arranged as follows:

[File]	[System]	[Config]	[Modulation]	[Cal]	[Special]

The menu bar consists of the same items as those of Spectrum Analyzer.

Select **[Modulation Analyzer]** from **[Config]** on the menu bar to select a modulation analysis function.

Select **[3GPP UL]** from **[Modulation]** on the menu bar to select the 3GPPUplink modulation analysis function.

10.3 Function Bar

This section describes the functions of each function button displayed on the function bar. The configuration of the function buttons of this option is as follows:

MEAS MODE	MEAS SETUP	MEAS VIEW	SCALE	MKR	INPUT	TRIGGER	LEVEL	FREQ

10.4 Soft Menu Bar

The area located on the right-hand side of the screen and in which soft keys are displayed is called the soft menu bar.

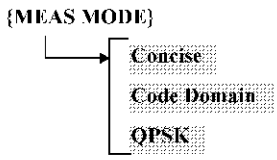
If a button on the function bar is touched, the associated soft keys are displayed on the soft menu bar.

10.5 Description of the Function of Each Key

This section describes the function of each key.

10.5.1 {MEAS MODE}

If the **{MEAS MODE}** button is touched, the soft keys related to the selection of the measurement mode are displayed on the soft menu bar.



Concise

If the **Concise** key is touched, the Concise mode is set. In the Concise Mode, a single slot is analyzed and the numerical results are displayed.

MEMO: This mode is suitable for the high-speed measurement to obtain the numerical results.

Code Domain

If the **Code Domain** key is touched, the Code Domain mode is set. In the Code Domain Mode, up to four frames are analyzed and the numerical results and graphs are displayed.

MEMO: The analysis in the Code Domain mode can be performed in detail than in the Concise mode. The AD data which is the same used in the Concise mode can be analyzed by combining the **Analysis Restart** *key.*

QPSK

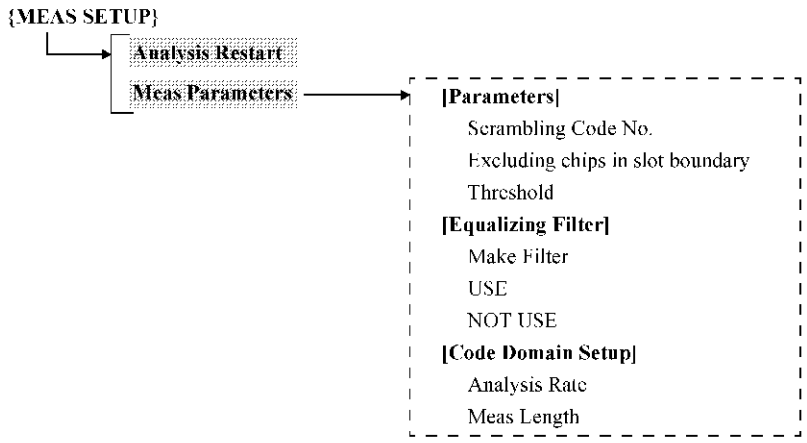
If the **QPSK** key is touched, the QPSK mode is set.
The QPSK mode analyzes the measurement signal as the QPSK signal or the HPSK signal and displays the numeric value result and the graph.

MEMO: The QPSK mode corresponds to 3.84 Mcps.

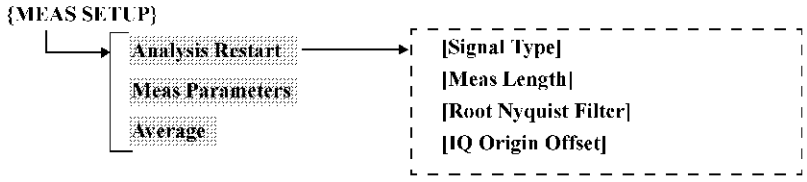
10.5.2 {MEAS SETUP}

When you touch the **{MEAS SETUP}** button, the soft keys related to the analysis parameter setting are displayed on the soft menu bar.

When {MEAS MODE} is set to Concise or Code Domain.



When {MEAS MODE} is set to QPSK.



Analysis Restart — If the **Analysis Restart** key is touched, the measurement of the AD data, which has already been obtained, re-starts.

Meas Parameters — If the **Meas Parameters** key is touched, the dialog box used to set the measurement conditions is displayed.

a) When **Concise** or **Code Domain** is selected as **{MEAS MODE}**.

[Parameters] — Sets the measurement conditions.

[Scrambling Code No.] Sets the Scrambling Code number.

[Excluding chips in slot boundary]
Sets the length of chips which are excluded from the first and last parts of the slot. The number of chips to be excluded can be set from 0 to 96.

[Threshold] — Sets the threshold level to determine the active channel. Can be set between -5 dB and -40 dB.

MEMO: The channel, whose Code Domain Power [dB] is less than the level set by **[Threshold]**, *is determined that the transmission is not performed.*

|Equalizing Filter| Sets to make the Equalizing Filter and sets whether to use it.

|Make Filter| Makes the Equalizing Filter.

[USE] Uses the Equalizing Filter.

[NOT USE] Does not use the Equalizing Filter.

IMPORTANT: Sets the **|Parameters|** *correctly when performing the* **[Make Filter]**.

|Code Domain Setup| Sets the measurement conditions in the **Code Domain** Mode. Valid only when the **{MEAS MODE}** is set to the Code Domain.

|Analysis Rate| Selects the symbol rate used to perform the Code Domain analysis.

15 ksps: Performs the Code Domain analysis at a symbol rate of 15 ksps.

30 ksps: Performs the Code Domain analysis at a symbol rate of 30 ksps.

60 ksps: Performs the Code Domain analysis at a symbol rate of 60 ksps.

120 ksps: Performs the Code Domain analysis at a symbol rate of 120 ksps.

240 ksps: Performs the Code Domain analysis at a symbol rate of 240 ksps.

480 ksps: Performs the Code Domain analysis at a symbol rate of 480 ksps.

960 ksps: Performs the Code Domain analysis at a symbol rate of 960 ksps.

MEMO: The results, which are analyzed at the symbol rate selected in the **[Analysis Rate]** *and analyzed at the active channel symbol rate, are displayed.*

[Meas Length] Selects the signal length used to perform the Code Domain analysis.

1SLOT: Performs the Code Domain analysis over the length of time of one slot.

1FRAME: Performs the Code Domain analysis over the length of time of one frame for each slot.

2FRAME: Performs the Code Domain analysis over the length of time of two frames for each slot.

3FRAME:
Performs the Code Domain analysis over the length of time of three frames for each slot.

4FRAME:
Performs the Code Domain analysis over the length of time of four frames for each slot.

Return — If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) If **QPSK** is selected as **{MEAS MODE}**.

|Signal Type| — Selects whether the signal is assumed to be a QPSK signal or an HPSK signal when the analysis is performed.

QPSK: Analyzes the signal assuming it is a QPSK signal.

HPSK: Analyzes the signal assuming it is an HPSK signal.

MEMO: ***The HPSK signal (QPSK signal) whose I and Q are the same amplitude cannot be measured in the HPSK signal analysis mode. Set Signal Type to QPSK and perform the measurement.***

[Meas Length] — Sets the measurement length for the analysis. 64 to 4096 chips can be set as the measurement length.

[Root Nyquist Filter] — Selects whether the Root Nyquist filter (roll off: 0.22) is used when the analysis is performed.

ON: Perform the analysis by using the Root Nyquist filter.

OFF: Perform the analysis by not using the Root Nyquist filter.

[IQ Origin Offset] — Selects whether to perform the analysis including the IQ origin offset.

INCLUDE: Performs the analysis including the IQ origin offset.

EXCLUDE: Performs the analysis excluding the IQ origin offset.

Return — If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

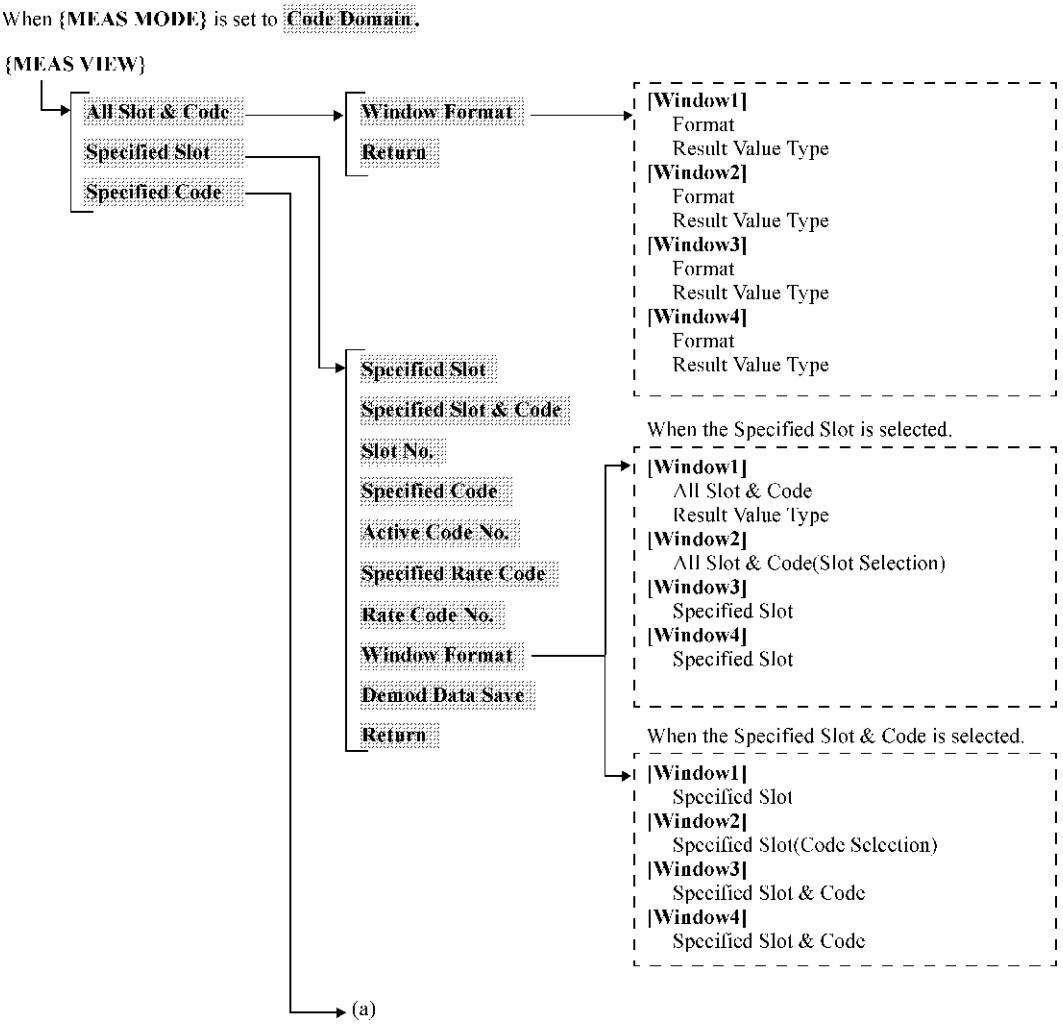
Average — Performs the averaging process.

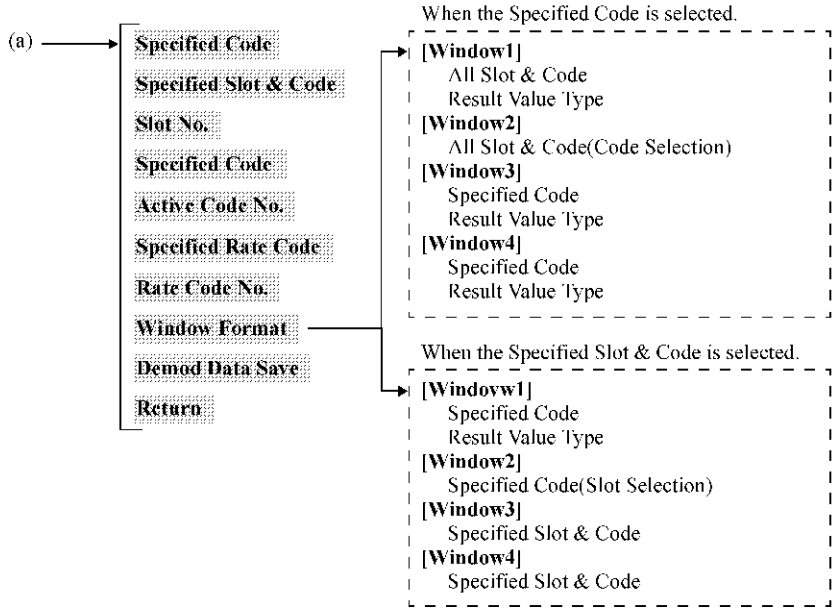
On: Performs the averaging process for the measurements which were performed the set number of times.

Off: Performs no averaging process.

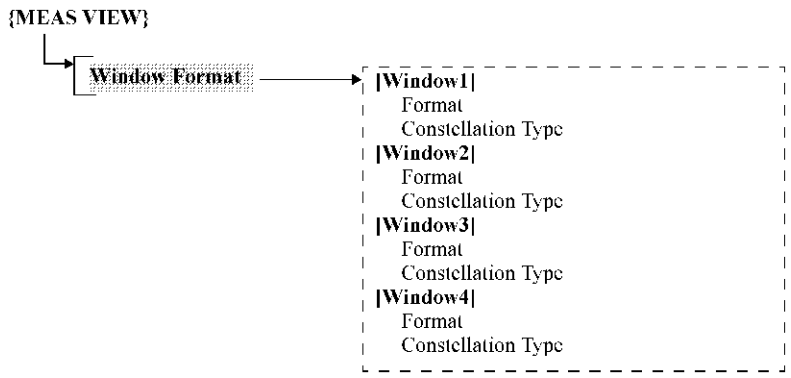
10.5.3 {MEAS VIEW}

If the **{MEAS VIEW}** button is touched, the soft keys related to the display screen setup are displayed on the soft menu bar. Valid only when the **{MEAS MODE}** is set to the **Code Domain** or **QPSK**.





When {**MEAS MODE**} is set to **QPSK**.



When **Code Domain** is selected as {**MEAS MODE**}.

All Slot & Code

If the **All Slot & Code** key is touched, the measurement results for all slots and all codes are displayed.

Window Format

If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

[Window1]

Sets the measurement result window located in the upper left when the 4-window display mode is set.

[Format]

Selects the measurement result window to be displayed.

Total Result:

Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window3] Sets for the measurement result window located in the lower left when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Format]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Return If the **Return** key is touched, the soft key array on the soft menu bar returns to the previous menu.

Specified Slot If the **Specified Slot** key is touched, the measurement results for the specified slot are displayed.

Specified Slot Displays the results for all slots and all codes on the two upper windows, and the results for the specified slot on the two lower windows. The slot can be specified by using the marker which is located in the upper right window, or by using the **Slot No.** key.

Specified Slot & Code Displays the results for the specified slot on the two upper windows, and the results for the specified slot and code on the two lower windows. The slot can be specified by using the **Slot No.** key. The code can be specified by using the marker which is located in the upper right window, or by using the **Active Code No.** key or the **Rate Code No.** key.

Slot No. Sets the slot number to display the results.

Specified Code Sets the type of the specified code number.
Valid only when the **Specified Slot & Code** is selected.

Rate: Specifies the code in the symbol rate, which is selected by the **[Analysis Rate]**.

Active: Specifies the active channel.

Active Code No. Specifies the code number of the active channel to display the results.
Valid only when Active of **Specified Slot & Code** or **Specified Code** is selected.

Specified Rate Code Select the code axis to display the results.
Valid only when Rate of **Specified Slot & Code** or **Specified Code** is selected.

I: Displays the result of the In-phase component.

Q: Displays the result of the Quadrature component.

Rate Code No. Sets the code number to display the results.
Valid only when the Rate of the **Specified Slot & Code** or **Specified Code** is selected.

Window Format If the **Window Format** key is touched, the dialog box used to set the measurement result window appears.

a) When the **Specified Slot** key is selected.

[Window1] Sets the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

|All Slot & Code|
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

|Result Value Type|
Selects the process type of the numerical results. Valid only when the **|All Slot & Code|** is set to **[Total Result]** or **|Active Channel List|**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code(Slot Selection)]
Selects the measurement result window to be displayed.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

[Window3] Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) When the **Specified Slot & Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for the slot which is specified by the **Slot No.** are displayed.

[Specified Slot] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Chip:
Displays the Error Vector Magnitude of each chip on a graph.

Mag Error vs Chip:
Displays the Magnitude Error of each chip on a graph.

Phase Error vs Chip:
Displays the Phase Error of each chip on a graph.

Constellation:
Displays the constellation of the multiplex signal on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for the slot which is specified by the **Slot No.** are displayed.

[Specified Slot(Code Selection)]
Selects the measurement result window to be displayed.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

[Window3] Sets for the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Active Code No.** key or the **Rate Code No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

[Window4] Sets for the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Active Code No.** key or the **Rate Code No.** are displayed.

[Specified Slot & Code]

Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

Return

If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Demod Data Save

Saves the same amount of demodulation data of the specified code as the measurement length.

Return

If the **Return** key is touched, the soft key array on the soft menu bar returns to the previous menu.

Specified Code

If the **Specified Code** key is touched, the measurement results for the specified code are displayed.

Specified Code

Displays the results for all slots and all codes on the two upper windows, and the results for the specified code on the two lower windows. The code can be specified by using the marker which is located in the upper right window, or by using the **Active Code No.** key or the **Rate Code No.** key.

Specified Slot & Code

Displays the results for the specified code on the two upper windows, and the results for specified slot and code on the two lower windows. The code can be specified by using the **Active Code No.** key or the **Rate Code No.** key.
The slot can be specified by using the marker which is located in the upper right window, or by using the **Slot No.** key.

Slot No.

Sets the slot number to display the results. Valid only when the **Specified Slot & Code** is selected.

Specified Code

Sets the type of the specified code number.

Rate: Specifies the code in the symbol rate, which is selected by the **[Analysis Rate]**.

Active: Specifies the active channel.

Active Code No.

Specifies the code number of the active channel to display the results.
Valid only when Active of the **Specified Code** is selected.

Specified Rate Code Select the code axis to display the results.
Valid only when Rate of the **Specified Code** is selected.

I: Displays the result of the In-phase component.

Q: Displays the result of the Quadrature component.

Rate Code No. Sets the code number to display the results.
Valid only when the Rate of the **Specified Code** is selected.

Window Format If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

a) When the **Specified Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results of the analyzed multiplex signal.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

Tx Power vs Slot:
Displays the Transmission Power of each slot on a graph.

Carrier Frequency Error vs Slot:
Displays the Carrier Frequency Error of each slot on a graph.

PCDE vs Slot:
Displays the Peak Code Domain Error of each slot on a graph.

Phase Discontinuity vs Slot:
Displays the Phase Discontinuity of each slot on a graph.

Active Channel List:
Displays the measurement result for the active channel in a list.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[All Slot & Code]** is set to **[Total Result]** or **[Active Channel List]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window2] Sets for the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for all slots and all codes are displayed.

[All Slot & Code(Code Selection)]
Selects the measurement result window to be displayed.

CDP vs Active Code(dBm):
Displays the code domain power [dBm] of the active channel on a graph.

CDP vs Active Code(dB):
Displays the code domain power [dB] of the active channel on a graph.

CDP vs I Code(dBm):
Displays the code domain power [dBm] of the In-phase component on a graph.

CDP vs Q Code(dBm):
Displays the code domain power [dBm] of the Quadrature component on a graph.

CDP vs I Code(dB):
Displays the code domain power [dB] of the In-phase component on a graph.

CDP vs Q Code(dB):
Displays the code domain power [dB] of the Quadrature component on a graph.

[Window3] Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Active Code No.** key or the **Rate Code No.** are displayed.

[Specified Code] Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

|Result Value Type|
Selects the process type of the numerical results. Valid only when the **[Specified Code]** is set to **[Total Result]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window4] Sets the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the code which is specified by the upper right window or the **Active Code No.** key or the **Rate Code No.** are displayed.

|Specified Code|Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

|Result Value Type|
Selects the process type of the numerical results. Valid only when the **|Specified Code|** is set to **|Total Result|**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

b) When the **Specified Slot & Code** key is selected.

[Window1] Sets for the measurement result window located in the upper left when the 4-window display mode is set. The measurement results for the code which is specified by the **Active Code No.** key or the **Rate Code No.** are displayed.

|Specified Code|Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Result Value Type]
Selects the process type of the numerical results. Valid only when the **[Specified Code]** is set to **[Total Result]**.

AVG: Displays the average value of the numerical results for each slot.

MAX: Displays the maximum value of the numerical results for each slot.

MIN: Displays the minimum value of the numerical results for each slot.

[Window2] Sets the measurement result window located in the upper right when the 4-window display mode is set. The measurement results for the code which is specified by the **Active Code No.** key or the **Rate Code No.** are displayed.

[Specified Code(Slot Selection)]
Selects the measurement result window to be displayed.

CDP vs Slot(dBm):
Displays the Code Domain Power [dBm] of each slot on a graph.

EVM vs Slot:
Displays the Error Vector Magnitude of each slot on a graph.

[Window3] Sets the measurement result window located in the lower left when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

[Window4] Sets the measurement result window located in the lower right when the 4-window display mode is set. The measurement results for the slot which is specified by the upper right window or the **Slot No.** are displayed.

[Specified Slot & Code]
Selects the measurement result window to be displayed.

Total Result:
Displays the numerical results which are analyzed for the specified code.

CDP vs Symbol(dBm):
Displays the Code Domain Power [dBm] of each symbol on a graph.

CDP vs Symbol(dB):
Displays the Code Domain Power [dB] of each symbol on a graph.

EVM vs Symbol:
Displays the Error Vector Magnitude of each symbol on a graph.

Demodulated Data:
Displays a list of the demodulation data of the specified code for one slot.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Demod Data Save Saves the same amount of demodulation data of the specified code as the measurement length.

Return If the **Return** key is touched, the soft key array on the soft menu bar returns to the previous menu.

When **{MEAS MODE}** is set to **QPSK**.

Window Format If the **Window Format** key is touched, the dialog box used to set the measurement result window is displayed.

[Window1] Sets the measurement result window which is located in the upper left when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the analyzed numeric value result.

Constellation:
Displays the constellation on a graph.

EVM vs chip:
Displays the error vector magnitude of each chip on a graph.

Mag Error vs chip:
Displays the magnitude error of each chip on a graph.

Phase Error vs chip:
Displays the phase error of each chip on a graph.

[Constellation type]
Selects the type of constellation graph display. Valid only when the **[Format]** is set to **[Constellation]**.

Line&Chip:
Displays the constellation in a line by connecting the transition between chips and displaying it in dots.

Chip: Displays the constellation in dots without connecting the transition between chips.

[Window2] Sets the measurement result window which is located in the upper right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the analyzed numeric value result.

Constellation:
Displays the constellation on a graph.

EVM vs chip:
Displays the error vector magnitude of each chip on a graph.

Mag Error vs chip:
Displays the magnitude error of each chip on a graph.

Phase Error vs chip:
Displays the phase error of each chip on a graph.

[Constellation type]
Selects the type of constellation graph display.
Valid only when the **[Format]** is set to **[Constellation]**.

Line&Chip:
Displays the constellation in a line by connecting the transition between chips and displaying it in dots.

Chip: Displays the constellation in dots without connecting the transition between chips.

[Window3] Sets the measurement result window which is located in the lower left when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the analyzed numeric value result.

Constellation:
Displays the constellation on a graph.

EVM vs chip:
Displays the error vector magnitude of each chip on a graph.

Mag Error vs chip:
Displays the magnitude error of each chip on a graph.

Phase Error vs chip:
Displays the phase error of each chip on a graph.

[Constellation type]
Selects the type of constellation graph display.
Valid only when the **[Format]** is set to **[Constellation]**.

Line&Chip:
Displays the constellation in a line by connecting the transition between chips and displaying it in dots.

Chip: Displays the constellation in dots without connecting the transition between chips.

[Window4] Sets the measurement result window which is located in the lower right when the 4-window display mode is set.

[Format] Selects the measurement result window to be displayed.

Total Result:
Displays the analyzed numeric value result.

Constellation:
Displays the constellation on a graph.

EVM vs chip:
Displays the error vector magnitude of each chip on a graph.

Mag Error vs chip:
Displays the magnitude error of each chip on a graph.

Phase Error vs chip:
Displays the phase error of each chip on a graph.

[Constellation type]
Selects the type of constellation graph display. Valid only when the [Format] is set to [Constellation].

Line&Chip:
Displays the constellation in a line by connecting the transition between chips and displaying it in dots.

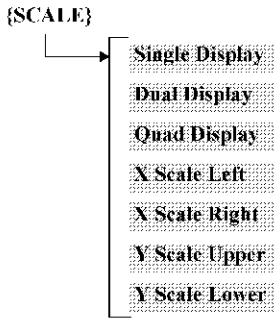
Chip: Displays the constellation in dots without connecting the transition between chips.

Return If the **Return** key is touched, the dialog box closes and the soft key array on the soft menu bar returns to the previous menu.

Return If the **Return** key is touched, the soft key array on the soft menu bar returns to the previous menu.

10.5.4 {SCALE}

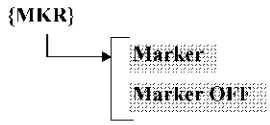
If the **{SCALE}** button is touched, the soft keys related to the setup of the X-axis and Y-axis scales in the active display window are displayed on the soft menu bar.



Single Display	Zooms in the upper left window when the 4-window display mode is set.
Dual Display	Zooms in the upper two windows when the 4-window display mode is set.
Quad Display	Changes the screen to the 4-window display mode.
X Scale Left	Sets the minimum value on the X axis.
X Scale Right	Sets the maximum value on the X axis.
Y Scale Upper	Sets the maximum value on the Y axis.
Y Scale Lower	Sets the minimum value on the Y axis.

10.5.5 {MKR}

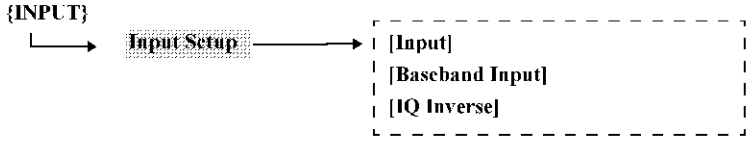
If the **{MKR}** button is touched, the soft keys related to the marker setup are displayed on the side menu bar. Valid only when the graph screen is selected.



Marker	Sets the X-axis position of the normal marker.
Marker OFF	Hides the marker.

10.5.6 {INPUT}

If the **{INPUT}** button is touched, the soft keys related to the setting up of the input format for the measuring instrument are displayed on the soft menu bar.



Input Setup If the **Input Setup** key is touched, the dialog box for setting up the input format for the measuring instrument is displayed. Set up in accordance with the measurement signal.

[Input] Sets the input channel for the signal.

RF: Sets the RF signal input.

Baseband (I&Q):
Sets the IQ signal (baseband) input.

[Baseband Input] Sets the coupling for the IQ signal input.

AC: Selects the AC coupling.

DC: Selects the DC coupling.

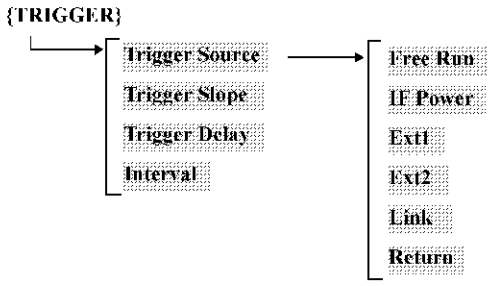
[IQ Inverse] Selects whether or not to invert the phase of the signal to be measured.

ON: Inverts the signal.

OFF: Does not invert the signal.

10.5.7 {TRIGGER}

If the **{TRIGGER}** button is touched, the soft keys related to the trigger setup are displayed on the soft menu bar.



Trigger Source

If the **Trigger Source** is touched, the soft keys related to the trigger setup are displayed on the soft menu bar.

Free Run

Obtains and analyzes data according to the internal timing of the measuring instrument.

IF Power

Obtains and analyzes data synchronized with the IF signal.

Ext1

Synchronizes the data reading with the external signal and analyzes the data entered into the EXT TRIG IN 1 connector. The threshold level for Ext1 is fixed to the TTL level.

Ext2

Synchronizes the data reading with the external signal and analyzes the data entered into the EXT TRIG IN 2 connector. The threshold level for Ext2 can be set.

Link

Obtains and analyzes data synchronizing with the trigger of an optional function.

MEMO: ***For information on how to the directions for use of the link trigger, refer to the manual of the option in which the link trigger is used.***

Return

Returns to the previous soft key array on the soft menu bar.

Trigger Slope

Switches the polarity of the trigger slope.
Available only for IF Power, Ext1, Ext2, and Link.

+: Starts sweeping at the rise of a trigger.

-: Starts sweeping at the fall of a trigger.

Trigger Delay

Sets the delay time from the trigger point. Is available only for IF Power, Ext1, Ext2, and Link. When analyzing, the start position of AD data acquisition is shifted to the delay time.

Interval

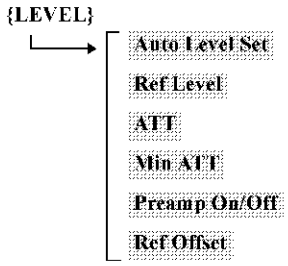
Sets whether to synchronize the built-in counter, whose period is set to 10 ms, and the trigger.

On: Synchronizes them.

Off: Does not synchronize them.

10.5.8 {LEVEL}

If the **{LEVEL}** button is touched, the soft keys related to the setup of the attenuator and reference level are displayed on the soft menu bar.



Auto Level Set

Sets the reference level to the optimum value in accordance with the signal to be measured. When the key is pressed, Auto Level Set is executed.

IMPORTANT: ***While Auto Level Set is being executed, the level of the signal measured must remain constant.***

Ref Level

Sets the reference level.

ATT

Sets the attenuator.

Auto: Automatically sets the attenuator value based on the reference level.

Man: Sets the attenuator value.

Min ATT

Sets the Min ATT function ON and OFF.

On: Sets the minimum attenuator value and implements control regardless of whether ATT is Auto or Manual.

Off: Cancels the Min ATT limitation.

Preamp On/Off

Sets the preamplifier function ON and OFF.

Ref Offset

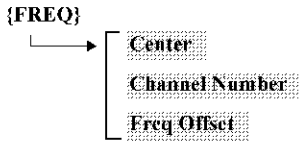
Switches the reference level offset function ON and OFF.

On: Sets the offset value and changes only the displayed reference level by the offset value.
(Displayed reference level = Set value + Offset value)

Off: Cancels the offset function.

10.5.9 {FREQ}

When you touch the **{FREQ}** button, the soft keys related to the measurement frequency setup are displayed on the soft menu bar.



Center

Sets the center frequency of the measurement signal.

IMPORTANT: Set the center frequency correctly. If it is set incorrectly, an error may occur in the center frequency error measurement and the measurement may be incorrect.

Channel Number

When the channel number is set, the center frequency is automatically set by using the following formula.

(Center frequency) = (Channel interval) × (Channel number + Channel offset) + (Start frequency)

The parameters such as the channel interval and the channel number setting range depend on the Standard selected by **[Special]** → **|STD...|**. For more information, refer to the R3681 Series User's Guide.

Freq Offset

Switches the center frequency offset function ON and OFF.

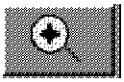
On: Sets the offset value and changes only the displayed center frequency by the offset value.
(Displayed center frequency = Set value + Offset value)

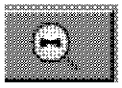
Off: Cancels the offset function.

10.5.10 Measurement Tool Bar

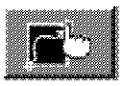
The functions of waveform range selection, active window selection, and so on are displayed as icons.

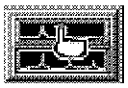
The following functions can be used by touching the icons:


: Zoom in icon: Used to zoom in on the waveform displayed in the window. The range specified by the range specification icon is zoomed in on by touching on the range.


: Zoom out icon: Used to zoom out from the waveform displayed in the window.


: Range specification icon (X-axis mode): Used to specify a range in the window in which the waveform is displayed. After touching the icon, specify the range by touching two points on the graph.


: Range specification icon (range mode): Used to specify a range in the window in which the waveform is displayed. Specify the upper-left and lower-right corners of the range by touching the display.


: Active window switching: Used to make one of the split windows active.


: Range shift icon: Used to shift the display position without changing the display range. After touching the icon, touch the inside of the graph frame in the direction to be shifted.

11. SCPI COMMAND REFERENCE(Uplink)

This chapter describes the SCPI command reference for this instrument.

11.1 Command Reference Format

This section describes the format and layout used to describe commands in this chapter.

Each description includes the following items:

Function description

SCPI command

Parameter

Query reply

- [Function description]

  The usage of commands and operations in this instrument.

- [SCPI command]

  The SCPI command displays the syntax of a command sent from the external controller to this instrument. The syntax consists of a command and a number of parameters. The command and the parameters are separated by a space.

  If a command has multiple parameters, they are separated by commas (,). The three points (...) displayed between commas represent the parameter(s) omitted at that position.

  For example, the description <numeric value 1>,..., <numeric value 4> shows that four parameters, <numeric value 1>, <numeric value 2>, <numeric value 3>, and <numeric value 4>, are required.

  If the parameter is a character string type such as <character string>,<character string 1>, the parameter must be enclosed in double quotation marks (" "). If the parameter is <block>, it shows the block format data.

  Text written in lowercase alphabetic characters in the syntax can be omitted.

  For example, ":CALibration:CABLe" can be abbreviated to ":CAL:CABL."

  The marks used in the syntax are defined as follows:

< >:	Shows a parameter required for sending a command
[ ]:	Shows that the command is optional It can be omitted
{}:	Shows that only one item is required to be selected from multiple items
|:	Used as a delimiter for multiple items written in curly brackets {..}
<ch>:	Written in the command header and shows the target input channel number of the command The channel number can be omitted. However, when it is written, channel number 1 is selected
<screen>:	Written in the command header and shows the target screen number of the command The screen number can be omitted. However, when it is written, a value from 1 to 4 can be selected [{1|2|3|4}]

For example, If the syntax below is specified, :CALC:CORR:EDEL:TIME 0.1 and : CALCULATE1:SELECTED:CORR:EDEL:TIME 25E-3 are valid.

Syntax: CALCulate{[1]|2|3|4}[:SELected]:CORRection:EDELay:TIME <numeric value>

- [Parameter]

  Describes a parameter required for sending a command.

  If the parameter is numeric type or alphabetic, it is enclosed in angle brackets (< >).

  If the parameter is optional, it is enclosed in curly brackets ({ }).

  In this manual, parameter types are described in the following formats:

  < int >: A numeric value that can be input in the format NR1, NR2, or NR3 and rounded to an integer in this instrument

  < real >: A numeric value that can be input in the format NR1, NR2, or NR3 and rounded to a valid-digit real number in this instrument

  < bool >: Either OFF or ON can be entered.

  < str >: A character string enclosed in quotation (' ') or double quotation (" ") marks.

  <block>: Block data type
  The data content is an 8-bit binary data array

  < type >: Character data selected from multiple types

- [Query reply]

  When there is a query reply to the command, the data format used for reading the query is described.

  Each parameter to be read is enclosed in curly brackets ({ }). If multiple items, which are delimited by a vertical bar (|), exist in curly brackets ({ }), only one of those items is read out. If parameters are delimited by commas (,) multiple parameters can be read out. The three points (...) displayed between commas represent data omitted from that position. For example, the description {numeric value 1},..., {numeric value 4} shows that four parameters {numeric value 1}, {numeric value 2}, {numeric value 3}, and {numeric value 4} are read.

  If the parameter to be read is enclosed in square brackets ([ ]), the parameter may be omitted, depending on the measurement result, etc.

  If the parameter to be read is a value in a unit, a description such as "Unit: dBm" is added to display the unit of the parameter value. However, only when the parameter is described in a level unit "dBm", the level unit selected at that time will be applied to the parameter.

11.2 Common Commands

This section describes common IEEE commands.

Function description	SCPI Command	Parameter	Query reply	Remarks
Clears the status byte and related data	*CLS	-	-	
Macro definition for GET	*DDT	<block>	<block>	*1
Sets the standard event status enable register	*ESE	<int>	<int>	
Reads the standard event status register	*ESR?	-	<int>	
Device inquiry	*IDN?	-	<str>	*2
Notifies when all running operations are complete	*OPC	-	1	
Loads the device settings	*RCL	<int> | POFF	-	*3
Resets the device	*RST	-	-	
Saves the device settings	*SAV	<int>	<int>	
Sets the service request enable register	*SRE	<int>	<int>	
Reads the status byte register	*STB?	-	<int>	
Triggers the device	*TRG	-	-	
Waits until all running operations are complete	*WAI	-	-	

*1: If the *DDT? command is executed when the macro is undefined, a zero-length block data (#10) is returned.
*2: <str> is output in the following format: maker name, model name, serial number and version number.
*3: POFF indicates the parameter settings when the power was last switched off.

11.3 List of Commands

11.3.1 Subsystem-SYSTem

Function description	SCPI command	Parameter	Query reply	Remarks
Config				
Measurement system selection	:SYSTem:SELect	SANalyzer|MANalyzer	SAN|MAN	
Modulation				
Modulation analysis system selection	:SYSTem:SELect:MODulation	W3GPPUL	W3GPPUL	
Preset				
Each measurement system parameter initialization	:SYSTem:PRESet	–	–	
All measurement systems initialization	:SYSTem:PRESet:ALL	–	–	
Log				
Inquiry about the error that occurred last	:SYSTem:ERRor?	–	<int>,<str>	
Inquiry about the details of the error log	:SYSTem:ERRor:ALL?	–	<int>,<str>	

11.3.2 Subsystem-INPut

Function description	SCPI command	Parameter	Query reply	Remarks
ATT/Preamp				
ATT setting (Manual)	:INPut:ATTenuation	<real>	<real>	
ATT(Auto/Manual)	:INPut:ATTenuation:AUTO	OFF|ON	OFF|ON	
Min ATT setting	:INPut:ATTenuation:MINimum	<real>	<real>	
Min ATT ON/OFF	:INPut:ATTenuation:MINimum:STATe	OFF|ON	OFF|ON	
Preamp ON/OFF	:INPut:GAIN:STATe	OFF|ON	OFF|ON	
Input Setup				
Input Signal RF/Baseband	:INPut:SIGNal	RF|BASeband	RF|BAS	
Baseband Input AC/DC	:INPut:BASeband	AC|DC	AC|DC	
IQ Inverse ON/OFF	:INPut:IQ:INVerse	OFF|ON	OFF|ON	

11.3.3 Subsystem-SENSe

Function description	SCPI command	Parameter	Query reply	Remarks
FREQuency				
Center Freq setting	[:SENSe]:FREQuency:CENTer	<real>	<real>	
Freq Offset setting	[:SENSe]:FREQuency:OFFSet	<real>	<real>	
Freq Offset ON/OFF	[:SENSe]:FREQuency:OFFSet:STATe	OFF|ON	OFF|ON	
Channel Number setting	[:SENSe]:FREQuency:CHANnel:NUMBer	<int>	<int>	
Auto Level Set				
Auto Level Set execution	[:SENSe]:POWer:LEVel:AUTO	–	–	
Meas Parameters (Concise/Code Domain)				
Scrambling Code No. setting	[:SENSe]:CONDition:SCNumber	<int>	<int>	
Excluding chips in slot boundary	[:SENSe]:CONDition:ECHip	<int>	<int>	
Threshold setting	[:SENSe]:CONDition:THReshold	<real>	<real>	
Creating Equalizing Filter	[:SENSe]:CONDition:EQUAlizer:MAKE	–	–	
Selecting whether to use Equalizing Filter	[:SENSe]:CONDition:EQUAlizer	NOT|USE	NOT|USE	
Code Domain analysis rate selection	[:SENSe]:CONDition:RATE	R15000|R30000| R60000|R120000| R240000 R480000 R960000	R15000|R30000 R60000|R120000| R240000|R480000| R960000	
Analysis range setting	[:SENSe]:CONDition:MLENgth	M1SLot|M1FRame| M2FRame M3FRame M4FRame	M1SL|M1FR| M2FR|M3FR| M4FR	
Meas Parameters (QPSK)				
Signal Type QPSK/HPSK	[:SENSe]:CONDition:QPSK:STYPe	QPSK|HPSK	QPSK|HPSK	
Signal analysis range setting	[:SENSe]:CONDition:QPSK:MLENgth	<int>	<int>	
Root Nyquist Filter ON/OFF	[:SENSe]:CONDition:QPSK:RNFilter	OFF|ON	OFF|ON	
IQ Origin Offset ON/OFF	[:SENSe]:CONDition:QPSK:IQOFfset	INCLude| EXCLude	INCL|EXCL	
Average				
Average ON/OFF	[:SENSe]:CONDition:AVERage[:STATe]	OFF|ON	OFF|ON	
Average count setting	[:SENSe]:CONDition:AVERage:COUNt	<int>	<int>	

11.3.4 Subsystem-CONFigure

Function description	SCPI command	Parameter	Query reply	Remarks
CONFigure				
Switching to the high-speed measurement mode in which the analysis items are limited	:CONFigure:CONCise	–	–	
Switching to the detailed code domain analysis mode	:CONFigure:CDOMain	–	–	
Switching to the QPSK signal analysis mode	:CONFigure:QPSK	–	–	

11.3.5 Subsystem-TRIGger

Function description	SCPI command	Parameter	Query reply	Remarks
SEQuence				
Trigger Source	:TRIGger[:SEQuence]:SOURce	IMMediate|IF| EXTernal1| EXTernal2|LINK	IMM|IF|EXT1| EXT2|LINK	
Trigger Slope	:TRIGger[:SEQuence]:SLOPe	POSitive| NEGative	POS|NEG	
IF Power setting	:TRIGger[:SEQuence]:LEVel:IF	<real>	<real>	
Ext2 Trigger Level setting	:TRIGger[:SEQuence]:LEVel:EXTernal	<real>	<real>	
Trigger Delay setting (chip)	:TRIGger[:SEQuence]:DELay:CHIP	<real>	<real>	
Interval Trigger setting	:TRIGger[:SEQuence]:INTerval:STATe	OFF|ON	OFF|ON	

11.3.6 Subsystem-INITiate

Function description	SCPI command	Parameter	Query reply	Remarks
INITiate				
Executing Single Measurement	:INITiate:MEASure:SINGle	–	–	
Executing Repeat Measurement	:INITiate:MEASure:REPeat	–	–	
Executing Analysis Restart	:INITiate:RESTart	–	–	
Executing Stop (measurement suspension)	:INITiate:ABORt	–	–	

11.3.7 Subsystem-DISPlay

Function description	SCPI command	Parameter	Query reply	Remarks
WINDow				
Ref Level setting	:DISPlay:TRACe:Y[:SCALe]:RLEVel	<real>	<real>	
Level Offset setting	:DISPlay:TRACe:Y[:SCALe]:RLEVel:OFFSet	<real>	<real>	
Level Offset ON/OFF	:DISPlay:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe	OFF|ON	OFF|ON	
MEAS VIEW				
MEAS VIEW selection	:DISPlay:MODE	ASCode|SSLot| SSCode|SCODe| SCSLot	ASC|SSL| SSC|SCOD| SCSL	
Specifying the Slot number (Specified Slot)	:DISPlay:MODE:SSLot:SLOT	<int>	<int>	
Setting the specification method of the Code number (Specified Slot)	:DISPlay:MODE:SSLot:CODE:STATe	RATE|ACTive	RATE|ACT	
Specifying the Active Code number (Specified Slot)	:DISPlay:MODE:SSLot:CODE:ACTive	<int>	<int>	
Setting the specified CH of the Rate Code number (Specified Slot)	:DISPlay:MODE:SSLot:RCODe:STATe	I|Q	I|Q	
Specifying the Rate specified analysis result Code number, which is displayed (Specified Slot)	:DISPlay:MODE:SSLot:CODE:RATE	<int>	<int>	
Specifying the Slot number (Specified Code)	:DISPlay:MODE:SCODe:SLOT	<int>	<int>	
Setting the specification method of the Code number (Specified Code)	:DISPlay:MODE:SCODe:CODE:STATe	RATE|ACTive	RATE|ACT	
Specifying the Active Code number (Specified Code)	:DISPlay:MODE:SCODe:CODE:ACTive	<int>	<int>	
Setting the specified CH of the Rate Code number (Specified Code)	:DISPlay:MODE:SCODe:RCODe:STATe	I|Q	I|Q	
Specifying the Rate specified analysis result Code number, which is displayed (Specified Code)	:DISPlay:MODE:SCODe:CODE:RATE	<int>	<int>	
Window Format: All Slot & Code				
Window Format setting	:DISPlay:MODE:ASCode:WINDow<scrn=1|2|3|4> :FORMat	TRESult ADBM| ADB IDBM|QDBM| IDB|QDB|EVM| POWer|FERRor PCDE|ACList| PDIScontinuity	TRES|ADBM| ADB|IDBM|QDBM| IDB|QDB|EVM| POW|FERR| PCDE|ACL|PDIS	
Result Value Type selection	:DISPlay:MODE:ASCode:WINDow<scrn=1|2|3|4> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	

11.3.7 Subsystem-DISPlay

Function description	SCPI command	Parameter	Query reply	Remarks
Window Format: Specified Slot				
Window Format setting (Window 1)	:DISPlay:MODE:SSLot:WINDow<scrn=1>:FORMat	TRESult|ADBM| ADB|IDBM QDBM IDB QDB EVM POWer|FERRor| PCDE ACList PDIScontinuity	TRES|ADBM| ADB IDBM|QDBM| IDB|QDB|EVM| POW FERR| PCDE|ACL PDIS	
Window Format setting (Window 2)	:DISPlay:MODE:SSLot:WINDow<scrn=2>:FORMat	EVM POWer FERRor|PCDE| PDIScontinuity	EVM|POW FERR|PCDE|PDIS	
Window Format setting (Windows 3/4)	:DISPlay:MODE:SSLot:WINDow<scrn=3|4> :FORMat	TRESult|ADBM| ADB|IDBM QDBM IDB QDB EVM MERRor|PERRor| CONStellation| ACList	TRES|ADBM| ADB IDBM|QDBM| IDB|QDB|EVM| MERR|PERR| CONS ACL	
Result Value Type selection	:DISPlay:MODE:SSLot:WINDow<scrn=1>:FORMat :RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Window Format: Specified Slot & Code				
Window Format setting (Window 1)	:DISPlay:MODE:SSCode:WINDow<scrn=1> :FORMat	TRESult|ADBM| ADB|IDBM QDBM IDB QDB EVM MERRor|PERRor| ACList	TRES|ADBM| ADB IDBM|QDBM| IDB|QDB|EVM| MERR|PERR|ACL	
Window Format setting (Window 2)	:DISPlay:MODE:SSCode:WINDow<scrn=2> :FORMat	ADBM|ADB| IDBM QDBM| IDB QDB	ADBM ADB IDBM|QDBM IDB|QDB	
Window Format setting (Window 3/4)	:DISPlay:MODE:SSCode:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| CDB|EVM|DDATa	TRES|CDBM| CDB EVM|DDAT	
Window Format: Specified Code				
Window Format setting (Window 1)	:DISPlay:MODE:SCODe:WINDow<scrn=1>:FORMat	TRESult|ADBM| ADB|IDBM QDBM IDB QDB EVM POWer|FERRor| PCDE ACList PDIScontinuity	TRES|ADBM| ADB IDBM|QDBM| IDB|QDB|EVM| POW FERR| PCDE|ACL PDIS	
Window Format setting (Window 2)	:DISPlay:MODE:SCODe:WINDow<scrn=2>:FORMat	ADBM|ADB| IDBM|QDBM| IDB|QDB	ADBM|ADB| IDBM|QDBM| IDB|QDB	
Window Format setting (Windows 3/4)	:DISPlay:MODE:SCODe:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| EVM	TRES|CDBM|EVM	
Result Value Type selection	:DISPlay:MODE:SCODe:WINDow<scrn=1|3|4> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Window Format: Specified Code & Slot				
Window Format setting (Window 1)	:DISPlay:MODE:SCSLot:WINDow<scrn=1>:FORMat	TRESult|CDBM| EVM	TRES|CDBM| EVM	
Window Format setting (Window 2)	:DISPlay:MODE:SCSLot:WINDow<scrn=2>:FORMat	CDBM|EVM	CDBM|EVM	
Window Format setting (Window 3/4)	:DISPlay:MODE:SCSLot:WINDow<scrn=3|4> :FORMat	TRESult|CDBM| CDB|EVM| DDATa	TRES|CDBM| CDB EVM|DDAT	
Result Value Type setting	:DISPlay:MODE:SCSLot:WINDow<scrn=1> :FORMat:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	

Function description	SCPI command	Parameter	Query reply	Remarks
Window Forma : QPSK				
Window Format setting	:DISPlay:QPSK:WINDow<scrn=1|2|3|4>:FORMat	TRESult| CONStellation| EVM|MERRor| PERRor	TRES|CONS| EVM|MERR| PERR	
Constellation Type selection	:DISPlay:QPSK:WINDow<scrn=1|2|3|4> :CONStellation:TYPE	LCHip|CHIP	LCHip|CHIP	
SCALe				
Multi Screen setting	:DISPlay	SINGle|DUAL| QUAD	SING|DUAL| QUAD	
X Scale Left setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe :X[:SCALe]:LEFT	<real>	<real>	
X Scale Right setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe :X[:SCALe]:RIGHt	<real>	<real>	
Y Scale Upper setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe :Y[:SCALe]:UPPer	<real>	<real>	
Y Scale Lower setting	:DISPlay[:WINDow<scrn=1|2|3|4>]:TRACe :Y[:SCALe]:LOWer	<real>	<real>	

11.3.8 Subsystem-CALCulate

Function description	SCPI command	Parameter	Query reply	Remarks
MARKer				
Marker ON/OFF	:CALCulate:MARKer<scrn=1|2|3|4>[:STATe]	OFF|ON	OFF|ON	
Marker X setting	:CALCulate:MARKer<scrn=1|2|3|4>:X	<real>	<real>	
Marker Y reading	:CALCulate:MARKer<scrn=1|2|3|4>:Y	–	real	
Marker setting in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:CHIP	<int>	<int>	
I reading in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:I	–	real	
Q reading in the Constellation display	:CALCulate:MARKer<scrn=1|2|3|4>:Q	–	real	
Result Value Type setting of Total Result measurement in ALL Slot & Code	:CALCulate:ASCode:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	
Result Value Type setting of Total Result measurement in Specified Code	:CALCulate:SCODe:RVALue	AVG|MAX|MIN	AVG|MAX|MIN	

11.3.9 Subsystem-MMEMory

Function description	SCPI command	Parameter	Query reply	Remarks
Save/Recall				
Saving the settings of this instrument	:MMEMory:STORe:STATe	<int>	–	*1
Loading the settings of this instrument	:MMEMory:LOAD:STATe	<int>	–	*1
Measurement condition Save selection	:MMEMory:SELect:ITEM:GPPUL:SETup	OFF|ON	OFF|ON	
Demod Data Save execution	:MMEMory:STORe:DDATa:STATe	<int>	<int>	

*1: A number, which is a maximum of 4-digit and is added to the file name of the data to be saved or loaded, must be specified in <int>.

11.3.10 Subsystem-MEASure

Function description	SCPI command	Parameter	Query reply	Remarks
MEASure: CONCise				
Reading Carrier Frequency Error	:MEASure:CONCise:TRESult:FERRor	–	<real>,<real>	*2
Reading EVM	:MEASure:CONCise:TRESult:EVM	–	<real>	
Reading Peak CDE	:MEASure:CONCise:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:MEASure:CONCise:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:MEASure:CONCise:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:MEASure:CONCise:TRESult:POWer	–	<real>	
MEASure: All Slot & Code				
Reading ρ	:MEASure:ASCode:TRESult:RHO	–	<real>	
Reading τ	:MEASure:ASCode:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:MEASure:ASCode:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:MEASure:ASCode:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:MEASure:ASCode:TRESult:IQOFfset	–	<real>	
Reading EVM	:MEASure:ASCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:MEASure:ASCode:TRESult:PEVM	–	<real>	
Reading Mag.Error	:MEASure:ASCode:TRESult:MERRor	–	<real>	
Reading Phase Error	:MEASure:ASCode:TRESult:PERRor	–	<real>	
Reading Peak CDE	:MEASure:ASCode:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:MEASure:ASCode:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:MEASure:ASCode:TRESult:PCDE:IQ	–	I|Q	
Reading Phase Discontinuity	:MEASure:ASCode:TRESult:PDIScontinuity	–	<real>,<real>, <real>	*4
Reading Tx Power	:MEASure:ASCode:TRESult:POWer	–	<real>	
Reading Number of Active Channel	:MEASure:ASCode:TRESult:ACHannel	–	<int>	
Reading Number of Average Slot	:MEASure:ASCode:TRESult:AVERage:SLOT	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*4 Outputs the value of Phase Discontinuity in order of $\Delta\theta \leq 30$deg, [Hz], 30deg $< \Delta\theta \leq 60$deg, [Hz], 60deg, and $< \Delta\theta$ [Hz].

11.3.10 Subsystem-MEASure

Function description	SCPI command	Parameter	Query reply	Remarks
MEASure: Specified Slot				
Reading ρ	:MEASure:SSLot:TRESult:RHO	–	<real>	
Reading τ	:MEASure:SSLot:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:MEASure:SSLot:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:MEASure:SSLot:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:MEASure:SSLot:TRESult:IQOFfset	–	<real>	
Reading EVM	:MEASure:SSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:MEASure:SSLot:TRESult:PEVM	–	<real>	
Reading Mag.Error	:MEASure:SSLot:TRESult:MERRor	–	<real>	
Reading Phase Error	:MEASure:SSLot:TRESult:PERRor	–	<real>	
Reading Peak CDE	:MEASure:SSLot:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:MEASure:SSLot:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:MEASure:SSLot:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:MEASure:SSLot:TRESult:POWer	–	<real>	
Reading Number of Active Channel	:MEASure:SSLot:TRESult:ACHannel	–	<int>	
Reading Slot Number	:MEASure:SSLot:TRESult:SLOT	–	<int>	
MEASure: Specified Slot & Code				
Reading ρ	:MEASure:SSCode:TRESult:RHO	–	<real>	
Reading EVM	:MEASure:SSCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:MEASure:SSCode:TRESult:PEVM	–	<real>	
Reading CDP	:MEASure:SSCode:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:MEASure:SSCode:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:MEASure:SSCode:TRESult:SRATe	–	<real>	
Reading SF	:MEASure:SSCode:TRESult:SF	–	<int>	
Reading Code No.	:MEASure:SSCode:TRESult:CODE	–	<int>	
Reading I or Q	:MEASure:SSCode:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:MEASure:SSCode:TRESult:ACK	–	<int>	
Reading CQI	:MEASure:SSCode:TRESult:CQI	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

Function description	SCPI command	Parameter	Query reply	Remarks
MEASure: Specified Code				
Reading ρ	:MEASure:SCODe:TRESult:RHO	–	<real>	
Reading EVM	:MEASure:SCODe:TRESult:EVM	–	<real>	
Reading Peak EVM	:MEASure:SCODe:TRESult:PEVM	–	<real>	
Reading CDP	:MEASure:SCODe:TRESult:CDP	–	<real>,<real>	*5
Reading Number of Average Slot	:MEASure:SCODe:TRESult:AVERage:SLOT	–	<int>	
Reading Symbol Rate	:MEASure:SCODe:TRESult:SRATe	–	<real>	
Reading SF	:MEASure:SCODe:TRESult:SF	–	<int>	
Reading Code No.	:MEASure:SCODe:TRESult:CODE	–	<int>	
Reading I or Q	:MEASure:SCODe:TRESult:IQ	–	I|Q	
MEASure: Specified Code & Slot				
Reading ρ	:MEASure:SCSLot:TRESult:RHO	–	<real>	
Reading EVM	:MEASure:SCSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:MEASure:SCSLot:TRESult:PEVM	–	<real>	
Reading CDP	:MEASure:SCSLot:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:MEASure:SCSLot:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:MEASure:SCSLot:TRESult:SRATe	–	<real>	
Reading SF	:MEASure:SCSLot:TRESult:SF	–	<int>	
Reading Code No.	:MEASure:SCSLot:TRESult:CODE	–	<int>	
Reading I or Q	:MEASure:SCSLot:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:MEASure:SCSLot:TRESult:ACK	–	<int>	
Reading CQI	:MEASure:SCSLot:TRESult:CQI	–	<int>	

*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

11.3.10 Subsystem-MEASure

Function description	SCPI command	Parameter	Query reply	Remarks
MEASure: QPSK				
Reading EVM	:MEASure:QPSK:TRESult:EVM	–	<real>	
Reading Mag. Error	:MEASure:QPSK:TRESult:MERRor	–	<real>	
Reading Phase Error	:MEASure:QPSK:TRESult:PERRor	–	<real>	
Reading Carrier Frequency	:MEASure:QPSK:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:MEASure:QPSK:TRESult:FERRor	–	<real>,<real>	
Reading IQ Origin Offset	:MEASure:QPSK:TRESult:IQOFfset	–	<real>	
Reading IQ Power Ratio	:MEASure:QPSK:TRESult:IQPRatio	–	<real>	

11.3.11 Subsystem-READ

Function description	SCPI command	Parameter	Query reply	Remarks
READ: CONCise				
Reading Carrier Frequency Error	:READ:CONCise:TRESult:FERRor	–	<real>,<real>	*2
Reading EVM	:READ:CONCise:TRESult:EVM	–	<real>	
Reading Peak CDE	:READ:CONCise:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:READ:CONCise:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:READ:CONCise:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:READ:CONCise:TRESult:POWer	–	<real>	
READ: All Slot & Code				
Reading ρ	:READ:ASCode:TRESult:RHO	–	<real>	
Reading τ	:READ:ASCode:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:READ:ASCode:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:READ:ASCode:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:READ:ASCode:TRESult:IQOFfset	–	<real>	
Reading EVM	:READ:ASCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:READ:ASCode:TRESult:PEVM	–	<real>	
Reading Mag.Error	:READ:ASCode:TRESult:MERRor	–	<real>	
Reading Phase Error	:READ:ASCode:TRESult:PERRor	–	<real>	
Reading Peak CDE	:READ:ASCode:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:READ:ASCode:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:READ:ASCode:TRESult:PCDE:IQ	–	I|Q	
Reading Phase Discontinuity	:READ:ASCode:TRESult:PDIScontinuity	–	<real>,<real>, <real>	*4
Reading Tx Power	:READ:ASCode:TRESult:POWer	–	<real>	
Reading Number of Active Channel	READ:ASCode:TRESult:ACHannel	–	<int>	
Reading Number of Average Slot	:READ:ASCode:TRESult:AVERage:SLOT	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*4 Outputs the value of Phase Discontinuity in order of $\Delta\theta \leq 30$deg, [Hz], 30deg $< \Delta\theta \leq$ 60deg, [Hz], 60deg, and $< \Delta\theta$ [Hz].

11.3.11 Subsystem-READ

Function description	SCPI command	Parameter	Query reply	Remarks
READ: Specified Slot				
Reading ρ	:READ:SSLot:TRESult:RHO	–	<real>	
Reading τ	:READ:SSLot:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:READ:SSLot:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:READ:SSLot:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:READ:SSLot:TRESult:IQOFfset	–	<real>	
Reading EVM	:READ:SSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:READ:SSLot:TRESult:PEVM	–	<real>	
Reading Mag.Error	:READ:SSLot:TRESult:MERRor	–	<real>	
Reading Phase Error	:READ:SSLot:TRESult:PERRor	–	<real>	
Reading Peak CDE	:READ:SSLot:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:READ:SSLot:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:READ:SSLot:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:READ:SSLot:TRESult:POWer	–	<real>	
Reading Number of Active Channel	:READ:SSLot:TRESult:ACHannel	–	<int>	
Reading Slot Number	:READ:SSLot:TRESult:SLOT	–	<int>	
READ: Specified Slot & Code				
Reading ρ	:READ:SSCode:TRESult:RHO	–	<real>	
Reading EVM	:READ:SSCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:READ:SSCode:TRESult:PEVM	–	<real>	
Reading CDP	:READ:SSCode:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:READ:SSCode:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:READ:SSCode:TRESult:SRATe	–	<real>	
Reading SF	:READ:SSCode:TRESult:SF	–	<int>	
Reading Code No.	:READ:SSCode:TRESult:CODE	–	<int>	
Reading I or Q	:READ:SSCode:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:READ:SSCode:TRESult:ACK	–	<int>	
Reading CQI	:READ:SSCode:TRESult:CQI	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

Function description	SCPI command	Parameter	Query reply	Remarks
READ: Specified Code				
Reading ρ	:READ:SCODe:TRESult:RHO	–	<real>	
Reading EVM	:READ:SCODe:TRESult:EVM	–	<real>	
Reading Peak EVM	:READ:SCODe:TRESult:PEVM	–	<real>	
Reading CDP	:READ:SCODe:TRESult:CDP	–	<real>,<real>	*5
Reading Number of Average Slot	:READ:SCODe:TRESult:AVERage:SLOT	–	<int>	
Reading Symbol Rate	:READ:SCODe:TRESult:SRATe	–	<real>	
Reading SF	:READ:SCODe:TRESult:SF	–	<int>	
Reading Code No.	:READ:SCODe:TRESult:CODE	–	<int>	
Reading I or Q	:READ:SCODe:TRESult:IQ	–	I|Q	
READ: Specified Code & Slot				
Reading ρ	:READ:SCSLot:TRESult:RHO	–	<real>	
Reading EVM	:READ:SCSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:READ:SCSLot:TRESult:PEVM	–	<real>	
Reading CDP	:READ:SCSLot:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:READ:SCSLot:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:READ:SCSLot:TRESult:SRATe	–	<real>	
Reading SF	:READ:SCSLot:TRESult:SF	–	<int>	
Reading Code No.	:READ:SCSLot:TRESult:CODE	–	<int>	
Reading I or Q	:READ:SCSLot:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:READ:SCSLot:TRESult:ACK	–	<int>	
Reading CQI	:READ:SCSLot:TRESult:CQI	–	<int>	
READ: QPSK				
Reading EVM	:READ:QPSK:TRESult:EVM	–	<real>	
Reading Mag. Error	:READ:QPSK:TRESult:MERRor	–	<real>	
Reading Phase Error	:READ:QPSK:TRESult:PERRor	–	<real>	
Reading Carrier Frequency	:READ:QPSK:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:READ:QPSK:TRESult:FERRor	–	<real>,<real>	
Reading IQ Origin Offset	:READ:QPSK:TRESult:IQOFfset	–	<real>	
Reading IQ Power Ratio	:READ:QPSK:TRESult:IQPRatio	–	<real>	

*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

11.3.12 Subsystem-FETCh

Function description	SCPI command	Parameter	Query reply	Remarks
FETCh: CONCise				
Reading Carrier Frequency Error	:FETCh:CONCise:TRESult:FERRor	–	<real>,<real>	*2
Reading EVM	:FETCh:CONCise:TRESult:EVM	–	<real>	
Reading Peak CDE	:FETCh:CONCise:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:FETCh:CONCise:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:FETCh:CONCise:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:FETCh:CONCise:TRESult:POWer	–	<real>	
READ: All Slot & Code				
Reading ρ	:FETCh:ASCode:TRESult:RHO	–	<real>	
Reading τ	:FETCh:ASCode:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:FETCh:ASCode:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:FETCh:ASCode:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:FETCh:ASCode:TRESult:IQOFfset	–	<real>	
Reading EVM	:FETCh:ASCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:FETCh:ASCode:TRESult:PEVM	–	<real>	*4
Reading Mag.Error	:FETCh:ASCode:TRESult:MERRor	–	<real>	
Reading Phase Error	:FETCh:ASCode:TRESult:PERRor	–	<real>	
Reading Peak CDE	:FETCh:ASCode:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:FETCh:ASCode:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:FETCh:ASCode:TRESult:PCDE:IQ	–	I|Q	
Reading Phase Discontinuity	:FETCh:ASCode:TRESult:PDIScontinuity	–	<real>,<real>, <real>	
Reading Tx Power	:FETCh:ASCode:TRESult:POWer	–	<real>	
Reading Number of Active Channel	:FETCh:ASCode:TRESult:ACHannel	–	<int>	
Reading Number of Average Slot	:FETCh:ASCode:TRESult:AVERage:SLOT	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*4 Outputs the value of Phase Discontinuity in order of $\Delta\theta \leq 30$deg, [Hz], 30deg < $\Delta\theta \leq 60$deg, [Hz], 60deg, and < $\Delta\theta$ [Hz].

Function description	SCPI command	Parameter	Query reply	Remarks
FETCh: Specified Slot				
Reading ρ	:FETCh:SSLot:TRESult:RHO	–	<real>	
Reading τ	:FETCh:SSLot:TRESult:TAU	–	<real>,<real>	*3
Reading Carrier Frequency	:FETCh:SSLot:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:FETCh:SSLot:TRESult:FERRor	–	<real>,<real>	*2
Reading IQ Origin Offset	:FETCh:SSLot:TRESult:IQOFfset	–	<real>	
Reading EVM	:FETCh:SSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:FETCh:SSLot:TRESult:PEVM	–	<real>	
Reading Mag.Error	:FETCh:SSLot:TRESult:MERRor	–	<real>	
Reading Phase Error	:FETCh:SSLot:TRESult:PERRor	–	<real>	
Reading Peak CDE	:FETCh:SSLot:TRESult:PCDE	–	<real>	
Reading Code Number of PCDE	:FETCh:SSLot:TRESult:PCDE:NUMBer	–	<int>	
Reading I or Q of PCDE	:FETCh:SSLot:TRESult:PCDE:IQ	–	I|Q	
Reading Tx Power	:FETCh:SSLot:TRESult:POWer	–	<real>	
Reading Number of Active Channel	:FETCh:SSLot:TRESult:ACHannel	–	<int>	
Reading Slot Number	:FETCh:SSLot:TRESult:SLOT	–	<int>	
FETCh: Specified Slot & Code				
Reading ρ	:FETCh:SSCode:TRESult:RHO	–	<real>	
Reading EVM	:FETCh:SSCode:TRESult:EVM	–	<real>	
Reading Peak EVM	:FETCh:SSCode:TRESult:PEVM	–	<real>	
Reading CDP	:FETCh:SSCode:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:FETCh:SSCode:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:FETCh:SSCode:TRESult:SRATe	–	<real>	
Reading SF	:FETCh:SSCode:TRESult:SF	–	<int>	
Reading Code No.	:FETCh:SSCode:TRESult:CODE	–	<int>	
Reading I or Q	:FETCh:SSCode:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:FETCh:SSCode:TRESult:ACK	–	<int>	
Reading CQI	:FETCh:SSCode:TRESult:CQI	–	<int>	

*2 Outputs the value of Frequency Error in order of [Hz] and [ppm].
*3 Outputs the value of τ in order of [μsec] and [chip].
*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

11.3.12 Subsystem-FETCh

Function description	SCPI command	Parameter	Query reply	Remarks
FETCh: Specified Code				
Reading ρ	:FETCh:SCODe:TRESult:RHO	–	<real>	
Reading EVM	:FETCh:SCODe:TRESult:EVM	–	<real>	
Reading Peak EVM	:FETCh:SCODe:TRESult:PEVM	–	<real>	
Reading CDP	:FETCh:SCODe:TRESult:CDP	–	<real>,<real>	*5
Reading Number of Average Slot	:FETCh:SCODe:TRESult:AVERage:SLOT	–	<int>	
Reading Symbol Rate	:FETCh:SCODe:TRESult:SRATe	–	<real>	
Reading SF	:FETCh:SCODe:TRESult:SF	–	<int>	
Reading Code No.	:FETCh:SCODe:TRESult:CODE	–	<int>	
Reading I or Q	:FETCh:SCODe:TRESult:IQ	–	I|Q	
FETCh: Specified Code & Slot				
Reading ρ	:FETCh:SCSLot:TRESult:RHO	–	<real>	
Reading EVM	:FETCh:SCSLot:TRESult:EVM	–	<real>	
Reading Peak EVM	:FETCh:SCSLot:TRESult:PEVM	–	<real>	
Reading CDP	:FETCh:SCSLot:TRESult:CDP	–	<real>,<real>	*5
Reading Slot No.	:FETCh:SCSLot:TRESult:SLOT	–	<int>	
Reading Symbol Rate	:FETCh:SCSLot:TRESult:SRATe	–	<real>	
Reading SF	:FETCh:SCSLot:TRESult:SF	–	<int>	
Reading Code No.	:FETCh:SCSLot:TRESult:CODE	–	<int>	
Reading I or Q	:FETCh:SCSLot:TRESult:IQ	–	I|Q	
Reading ACK/NACK	:FETCh<ch=1|2>:SCSLot:TRESult:ACK	–	<int>	
Reading CQI	:FETCh<ch=1|2>:SCSLot:TRESult:CQI	–	<int>	
FETCh: QPSK				
Reading EVM	:FETCh:QPSK:TRESult:EVM	–	<real>	
Reading Mag. Error	:FETCh:QPSK:TRESult:MERRor	–	<real>	
Reading Phase Error	:FETCh:QPSK:TRESult:PERRor	–	<real>	
Reading Carrier Frequency	:FETCh:QPSK:TRESult:CARRier	–	<real>	
Reading Carrier Frequency Error	:FETCh:QPSK:TRESult:FERRor	–	<real>,<real>	
Reading IQ Origin Offset	:FETCh:QPSK:TRESult:IQOFfset	–	<real>	
Reading IQ Power Ratio	:FETCh:QPSK:TRESult:IQPRatio	–	<real>	

*5 Outputs the value of Code Domain Power in order of [dBm] and [dB].

11.4 Status Register

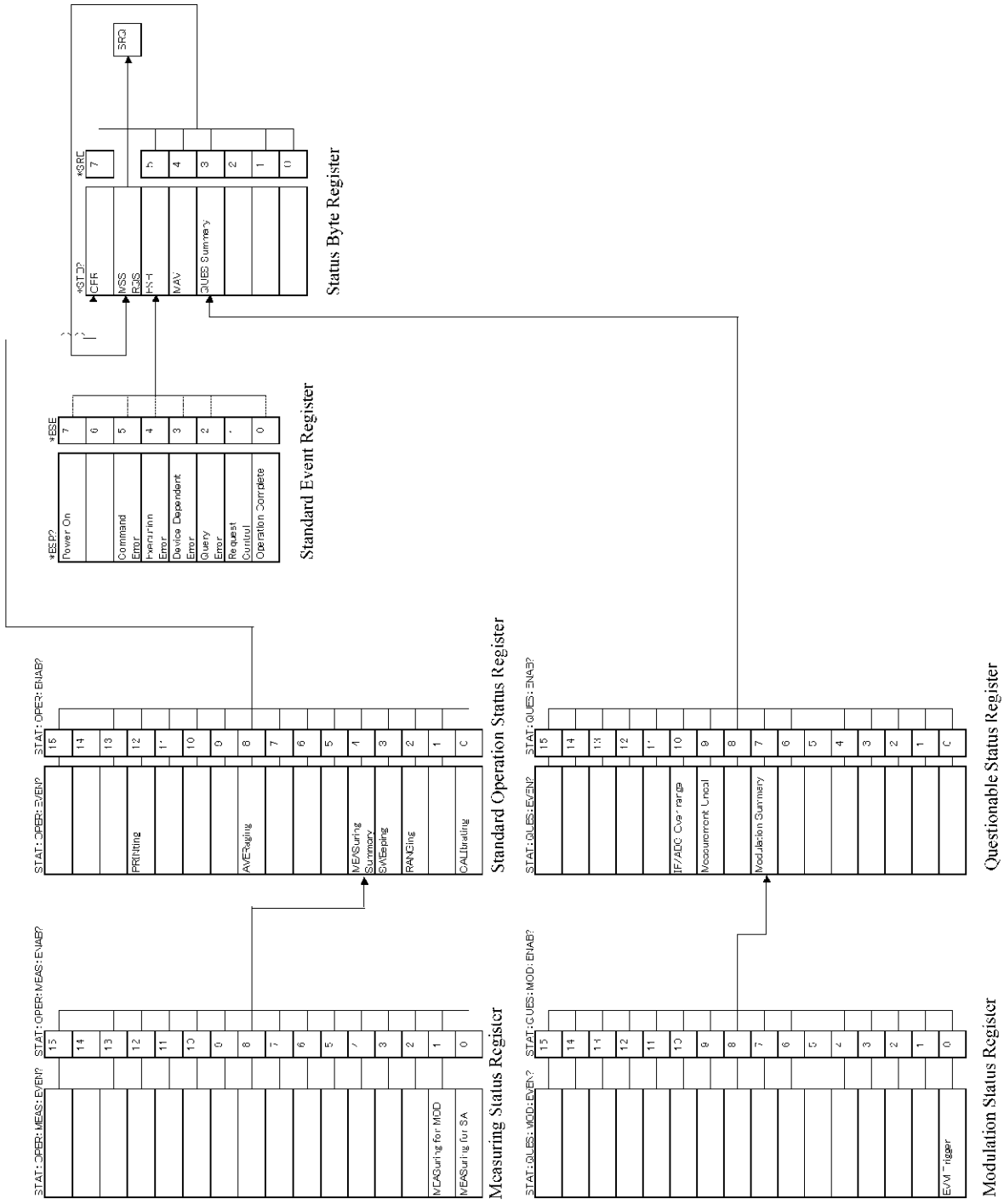


Figure 11-1 Status Registers

12. PERFORMANCE VERIFICATION (Uplink)

This chapter describes how to verify whether this instrument meets the specified performance.

It is recommended that you copy the test data record sheet included in the last of this chapter and save it as a record of the performance test.

IMPORTANT: Before executing the performance verification, execute warm-up and all calibrations.

12.1 Test Signal Specifications

The test signals used for performance verification are shown below:

Table 12-1 Test Signal Specifications

Test signal name	Signal specifications						Test item
Mobile station signal	Scrambling Code No.:	1					RF input Uplink measurement
	Active channel:	DPCCH	15 ksps	No.0	Q	-5.46 dB	IQ input Uplink measurement
		DPDCH	60 ksps	No.16	I	0.00 dB	
QPSK signal	Modulation format	QPSK					RF input QPSK measurement
	Chip rate	3.84 Mcps					IQ input QPSK measurement
	Transmission filter	Root Nyquist filter (roll-off: 0.22)					

12.2 Test Procedures

This section describes the procedures of each test item.

12.2.1 RF Input Mobile Station Signal Measurement

Connect the signal source as shown below:

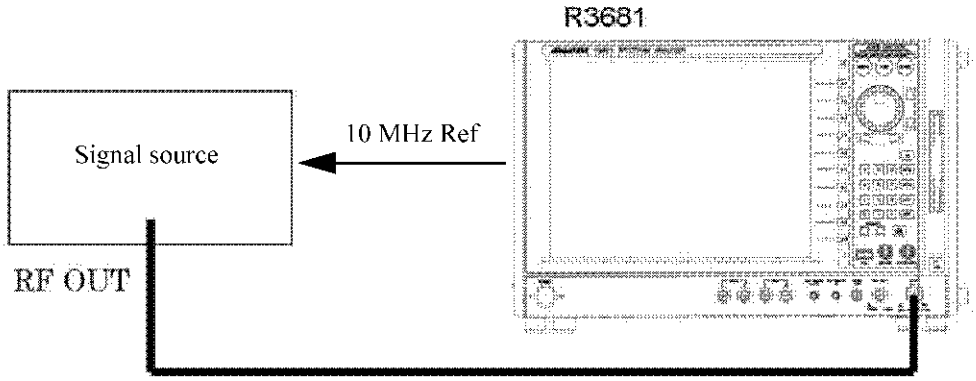


Figure 12-1 Connection Diagram of Signal Source

1. The mobile station signal, which has a carrier frequency of 800 MHz (1.9 GHz) and a level of -10 dBm (-20 dBm), is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}: **Code Domain**

{MEAS SETUP}: **Meas Parameters**

Parameters

[Scrambling Code No.]: 1

[Excluding chips in slot boundary]: 96 chip

[Threshold]: -30 dB

Equalizing Filter: NOT USE

Code Domain Setup

[Analysis Rate]: 15 ksps

[Meas Length] 1SLOT

{INPUT}: **Input** RF

{TRIGGER}: **Trigger Source** Free Run

{LEVEL}: Execute **Auto Level Set**

{FREQ}: **Center** 800 MHz (1.9 GHz)

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

12.2.2 IQ Input Mobile Station Signal Measurement

Connect the signal source as shown below:

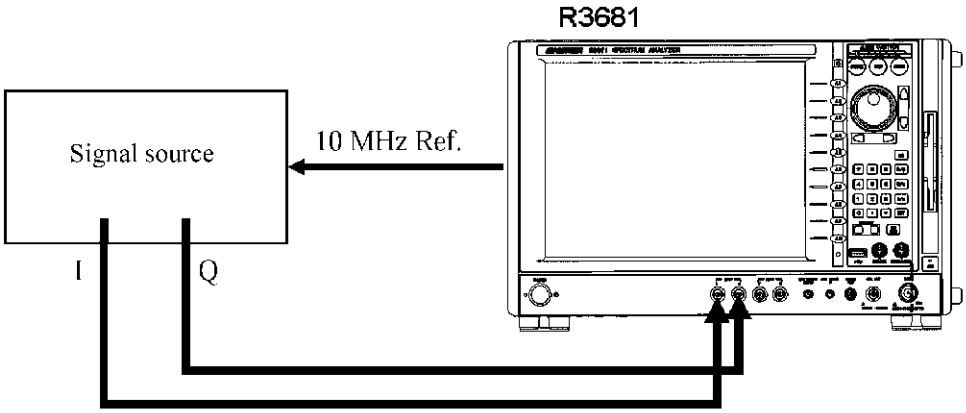


Figure 12-2 Connection Diagram of Signal Source (IQ Input)

1. The base band signal of the mobile station signal is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}: **Code Domain**

{MEAS SETUP}: **Meas Parameters**

Parameters

[Scrambling Code No.]: 1

[Excluding chips in slot boundary]: 96 chip

[Threshold]: -30 dB

Equalizing Filter: NOT USE

Code Domain Setup

[Analysis Rate]: 15 ksps

[Meas Length]: 1SLOT

{INPUT}: **Input** Baseband(I&Q)

Baseband Input AC

{TRIGGER}: **Trigger Source** Free Run

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

12.2.3 RF Input QPSK Signal Measurement

Connect the signal source as shown below:

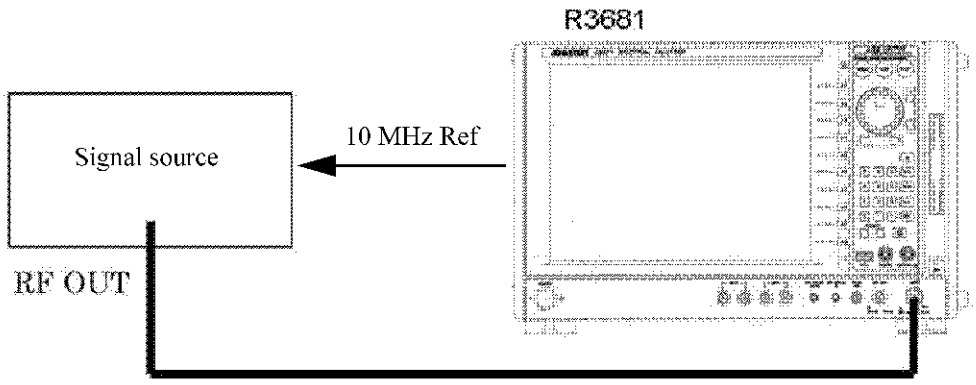


Figure 12-3 Connection Diagram of Signal Source

1. The QPSK signal, which has a carrier frequency of 800 MHz (1.9 GHz) and a level of -10 dBm (-20 dBm), is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}:	**QPSK**		
{MEAS SETUP}:	**Meas Parameters**		
	[Signal Type]:		QPSK
	[Meas Length]:		2368 chip
	[Root Nyquist Filter]:		ON
	[IQ Origin Offset]:		INCLUDE
{INPUT}:	**Input**	RF	
{TRIGGER}:	**Trigger Source**	Free Run	
{LEVEL}:	Execute **Auto Level Set**		
{FREQ}:	**Center**	800 MHz (1.9 GHz)	

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

12.2.4 IQ Input QPSK Signal Measurement

Connect the signal source as shown below:

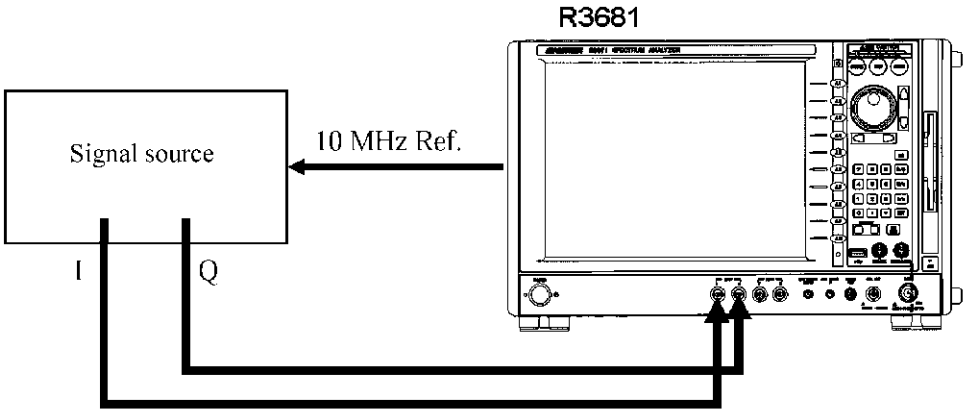


Figure 12-4 Connection Diagram of Signal Source (IQ Input)

1. The base band signal of the QPSK signal is output from the signal source.
2. Set this unit as follows:

{MEAS MODE}:	**QPSK**		
{MEAS SETUP}:	**Meas Parameters**		
	[Signal Type]:		QPSK
	[Meas Length]:		2368 chip
	[Root Nyquist Filter]:		ON
	[IQ Origin Offset]:		INCLUDE
{INPUT}:	**Input**	Baseband(I&Q)	
	Baseband Input	AC	
{TRIGGER}:	**Trigger Source**	Free Run	

3. Press the **SINGLE** button on this unit to perform measurements.
4. Write the measurement results in the test data record sheet.

12.3 Test Data Record Sheet

Test data record sheet

Model name:

Serial number:

1. RF Input Measurement (carrier frequency: 800 MHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-40 dB	
Transmission power	-10.8 dBm		-9.2 dBm	

2. RF Input Measurement (carrier frequency: 1.9 GHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-40 dB	
Transmission power	-10.8 dBm		-9.2 dBm	

3. IQ Input Measurement

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
EVM measurement	None		1.5%rms	
PeakCDE measurement	None		-40 dB	

4. RF input QPSK measurement (carrier frequency: 800 MHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.5%rms	

5. RF input QPSK measurement (carrier frequency:1.9 GHz)

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
Carrier frequency error measurement	-5.0 Hz		5.0 Hz	
EVM measurement	None		1.5%rms	

6. IQ input QPSK measurement

Test item	Specifications			Determination Pass / Fail
	Minimum value	Measured value	Maximum value	
EVM measurement	None		1.5%rms	

13. SPECIFICATIONS (Uplink)

13.1 3GPP Modulation Analysis Compliance System

3rd Generation Partnership Project (3GPP)

Technical Specification

TS 25.211 V5.5.0

TS 25.213 V5.4.0

In compliance with

13.2 3GPP Modulation Analysis Performance

Conditions

Item	Conditions
Temperature range	+20°C to +30°C
Signal	
Active channel	DPCCH 15 ksps No. 0 Q -5.46 dB DPDCH 60 ksps No. 15 I 0.00 dB
Power	-10 dBm, -20 dBm
EVM	0%rms
Measurement mode	Concise, Code Domain

Item	Conditions
Carrier frequency error	For a center frequency of 800 MHz or 1.9 GHz
Measurement range	<±1 kHz
Measurement accuracy	<± (Measurement accuracy × Carrier frequency + 5 Hz)
EVM	
Residual EVM	<1.5%rms for a center frequency of 800 MHz or 1.9 GHz or IQ input
Peak CDE	For a center frequency of 800 MHz or 1.9 GHz or for IQ input
Measurement accuracy	<-40 dB
Transmission power	
Measurement accuracy	<± (0.2 + Frequency response + calibration signal level accuracy) dB Frequency response 50 MHz to 2.5 GHz <±0.4 dB 20 Hz to 3.5 GHz <±1.0 dB Calibration signal level accuracy<±0.2 dB

13.3 QPSK Modulation Analysis Performance

Conditions

Item	Conditions
Temperature range	+20°C to +30°C
Signal	
Modulation format	QPSK
Chip rate	3.84 Mcps
Transmission filter	Root Nyquist filter (roll-off: 0.22)
Power	-10 dBm, -20 dBm
EVM	0%rms
Measurement mode	QPSK
Setting	
Measurement length	2368 chips

Item	Conditions
Carrier frequency error	For center frequencies of 800 MHz and 1.9 GHz
Measurement range	<±1 kHz
Measurement accuracy	<± (Measurement accuracy × Carrier frequency + 5 Hz)
EVM	For center frequencies of 800 MHz and 1.9GHz, IQ input
Residual EVM	<1.5%rms

APPENDIX

This section describes the following supplemental information:

A.1 Technical Data

A.2 Error Message List

A.1 Technical Data

A.1.1 Method Used to Calculate Measurement Values

Error Vector Magnitude (EVM)

EVM is defined by Figure A-1 and can be obtained by using the following equation.

$$EVM = \sqrt{\frac{\sum_{i}^{K}\left\{(\mathrm{Im}(i)-Ir(i))^2+(Qm(i)-Qr(i))^2\right\}}{\sum_{i}^{K}\left\{Ir(i)^2+Qr(i)^2\right\}}}\times 100$$

Im(i),Qm(i):	Measurement value
Ir(i),Qr(i):	Reference value
i:	Chip number
K:	Measurement length

Magnitude Error

Magnitude Error is defined by Figure A-1 and can be obtained by using the following equation.

$$MagnitudeError = \sqrt{\frac{\sum_{i}^{K}\left\{\sqrt{\mathrm{Im}(i)^2+\mathrm{Im}(i)^2}-\sqrt{Ir(i)^2+Ir(i)^2}\right\}}{\sum_{i}^{K}\left\{Ir(i)^2+Qr(i)^2\right\}}}\times 100$$

Im(i),Qm(i):	Measurement value
Ir(i),Qr(i):	Reference value
i:	Chip number
K:	Measurement length

Phase Error

Phase Error is defined by Figure A-1 and can be obtained by using the following equation.

$$PhaseError = \sqrt{\frac{\sum_{i}^{K}\left\{\tan^{-1}(Qm(i)/\mathrm{Im}(i)) - \tan^{-1}(Qr(i)/Ir(i))\right\}^2}{K}} \times 100$$

Im(i),Qm(i):	Measurement value
Ir(i),Qr(i):	Reference value
i:	Chip number
K:	Measurement length

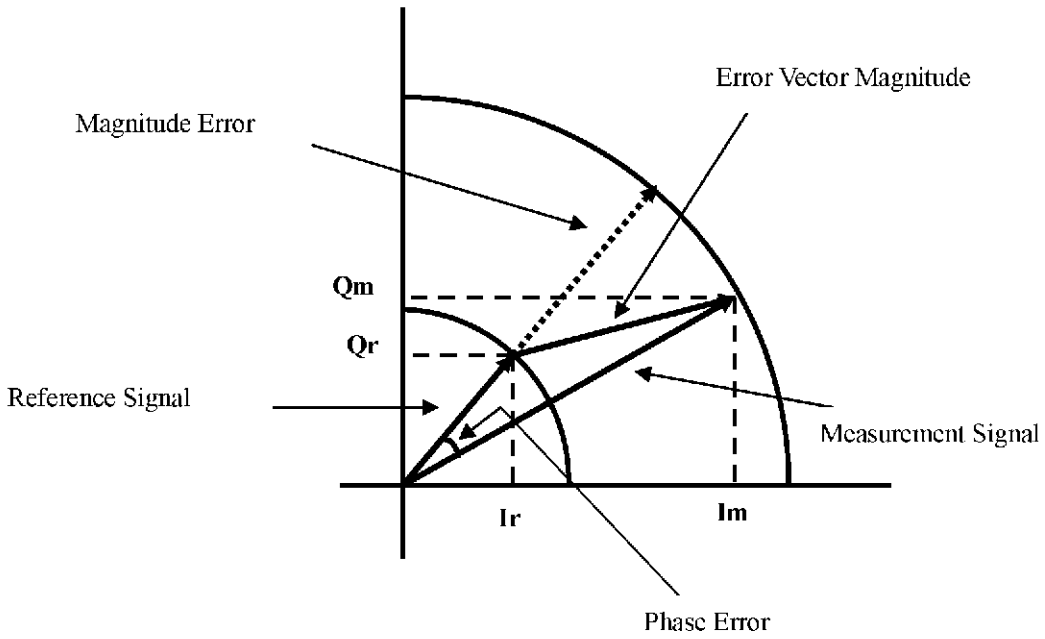


Figure A-1 Error Vector Magnitude, Magnitude Error, Phase Error

Waveform quality (ρ)

The waveform quality can be obtained by using the following equation.

$$\rho = \frac{\left|\sum_{i}^{K}\{\mathrm{Im}(i)+jQm(i)\}\{Ir(i)+jQr(i)\}\right|^2}{\sum_{i}^{K}\{\mathrm{Im}(i)^2+Qm(i)^2\}\sum_{i}^{K}\{Ir(i)^2+Qr(i)^2\}}$$

Im(i),Qm(i):	Measurement value
Ir(i),Qr(i):	Reference value
i:	Chip number
K:	Measurement length

Peak Code Domain Error (PCDE)

Peak Code Domain Error can be obtained by using the following equation.

$$PCDE = 10Log_{10}\left[\frac{\underset{c}{Max}\left\{\sum_{h}^{N}\left|\sum_{i}^{M}\{Z(h\cdot M+i)-R(h\cdot M+i)\}\{r_c^{*}(h\cdot M+i)\}\right|^2\right\}}{\sum_{i}^{M}|r_c(h\cdot M+i)|^2\sum_{h}^{N}\sum_{i}^{M}|R(h\cdot M+i)|^2}\right]$$

Z:	Measurement value
	= Im(i) + jQm(i)
R:	Reference value
	= Ir(i) + jQr(i)
r_c:	C-channel spreading code
h:	Symbol number
i:	Chip number
M:	Number of chips per symbol
N:	Number of measurement symbols

Tx Power

Tx Power refers to the transmission power [dBm] per carrier. When calculating the Tx Power, the test signal is filtered to eliminate interference from sources such as the adjacent carrier. A filter that allows signal bands of 4.6848 MHz = 3.84 MHz × 1.22 to pass is used. Therefore, the Tx Power is approximately 0.246 dB larger than the transmission power of the signal that passes through the root Nyquist filter.

Code Domain Power [dBm]

Code Domain Power [dBm] is calculated to the signal which passed along the root Nyquist filter.

A.1.2 IQ Origin Offset (DC Offset)

The 3GPP standard states that the IQ origin offset should be included when calculating the Error Vector Magnitude. Therefore, in this option, the IQ origin offset is included in the calculation. As a result, the larger the IQ origin offset, the larger the Error Vector Magnitude value becomes.

A.1.3 Measurement Length for Carrier Frequency Error

The 3GPP standard states that the carrier frequency error should be calculated over the length of time of one slot. Therefore, in this option, it is also calculated over the length of time of one slot. If the measurement length (**[Meas Length]**) is set to 1 frame or more, the carrier frequency error is measured for each slot and the average, the maximum and the minimum values are displayed.

A.1.4 [Threshold]

A threshold value is used to determine a active channel. A channel that has a larger power than the threshold value is determined to be a active channel. The threshold value is the power ratio to the total power and is set by **[Threshold]**.

A.1.5 The Measurement Result Screen in the Code Domain Mode

The following three types of graph are provided in the Code Domain Mode measurement result screen.

- **All Slot & Code** Displays the results of all slots and all codes.
- **Specified Slot** Displays the results of a specified slot.
- **Specified Code** Displays the results of a specified code.

All Slot & Code

The **All Slot & Code** displays the measurement results of all slots and codes in four separate windows.

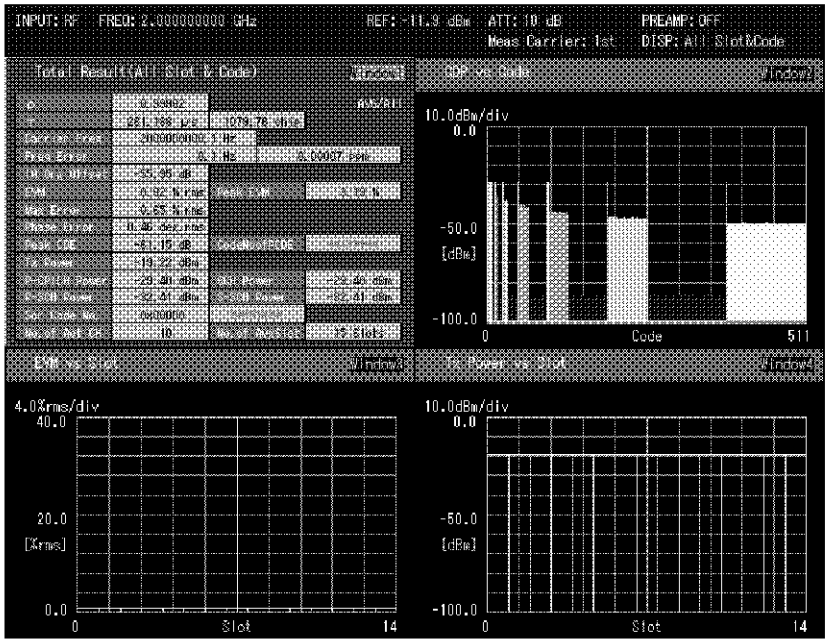


Figure A-2 Results of All Slots and All Codes (Downlink)

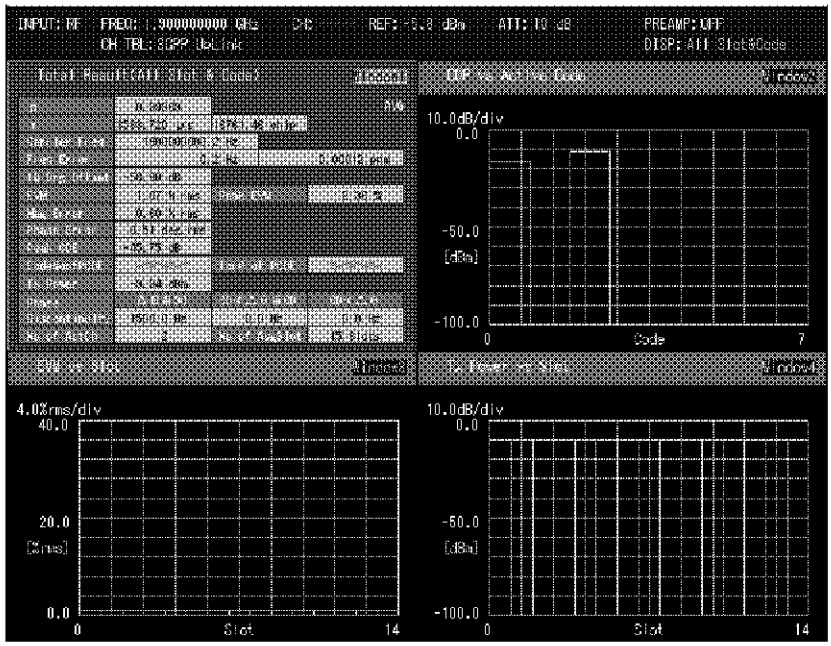


Figure A-3 Results of All Slots and All Codes (Uplink)

Specified Slot

The **Specified Slot** displays the measurement results of a specified slot.

There are two combinations of the separate windows.

- **Specified Slot** — The results of all slots and all codes are displayed in the upper two windows.
  The results of a specified slot are displayed in the lower two windows.
- **Specified Slot & Code** — The results of a specified slot are displayed in the upper two windows.
  The results of a specified slot and a specified code are displayed in the lower two windows.

- **Specified Slot**

This screen displays the results of all slots and all codes in the upper two windows, and the results of a specified slot in the lower two windows. The measurement results of the slot, which is specified by a marker in the upper right window, are displayed in the lower two windows. This screen is useful when evaluating the measurement results of a specific slot that is chosen from the results of all slot measurements.

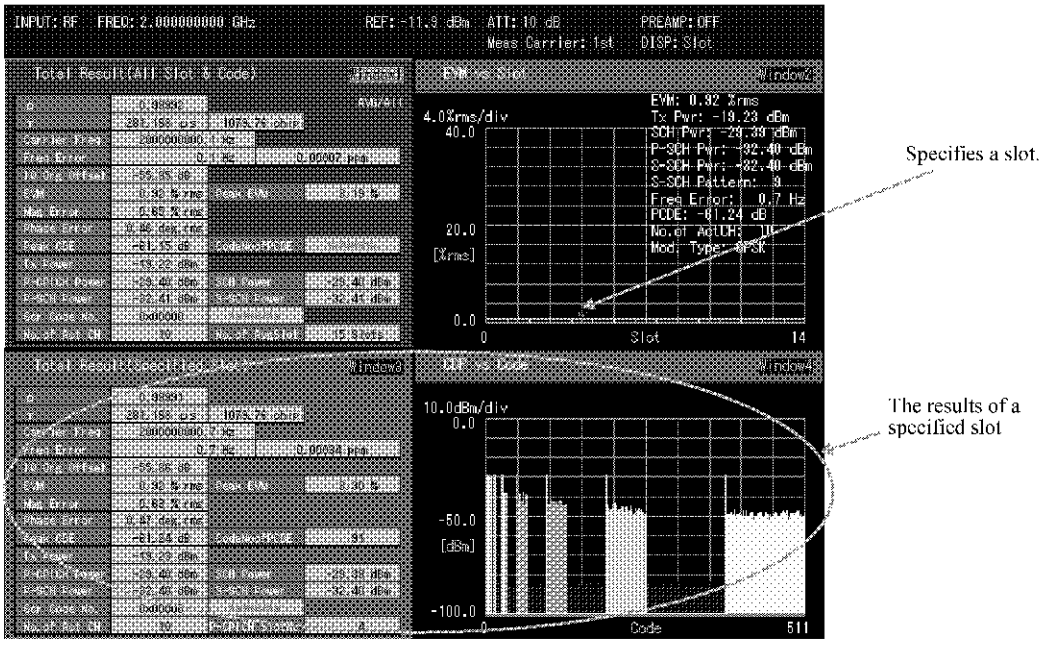


Figure A-4 Specified Slot Screen (that displays the results of all slots and all codes in the upper two windows and the results of a specified slot in the lower two windows (Downlink))

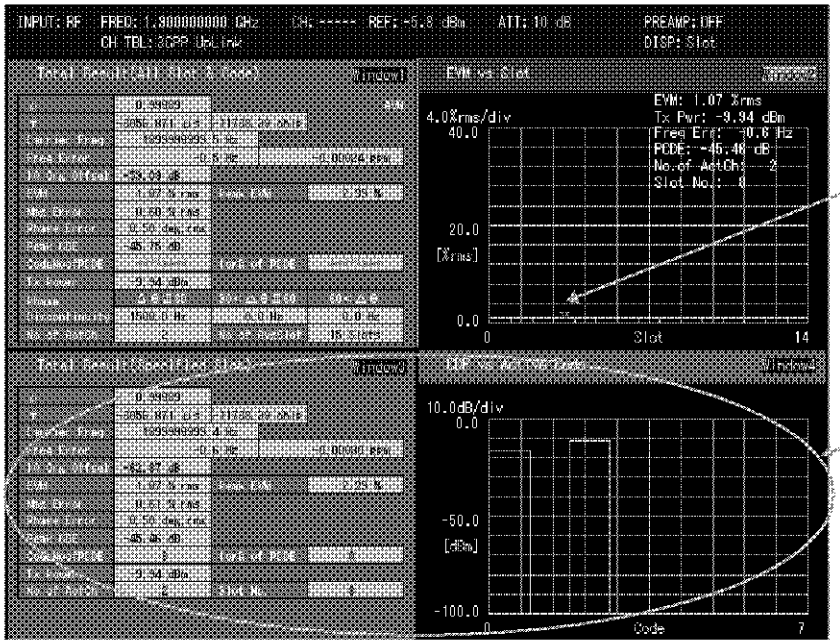


Figure A-5 Specified Slot Screen (that displays the results of all slots and all codes in the upper two windows and the results of a specified slot in the lower two windows (Uplink))

- **Specified Slot & Code**

  This screen displays the results of the slot, which is specified by **Slot No.**, in the upper two windows, and the results of the specified slot and a specified code in the lower two windows.

  The measurement results of the code, which is specified by a marker in the upper right window, are displayed in the lower two windows.

  This screen is useful when evaluating the measurement results of a specific code that is chosen from the results of all code measurements.

A.1.5 The Measurement Result Screen in the Code Domain Mode

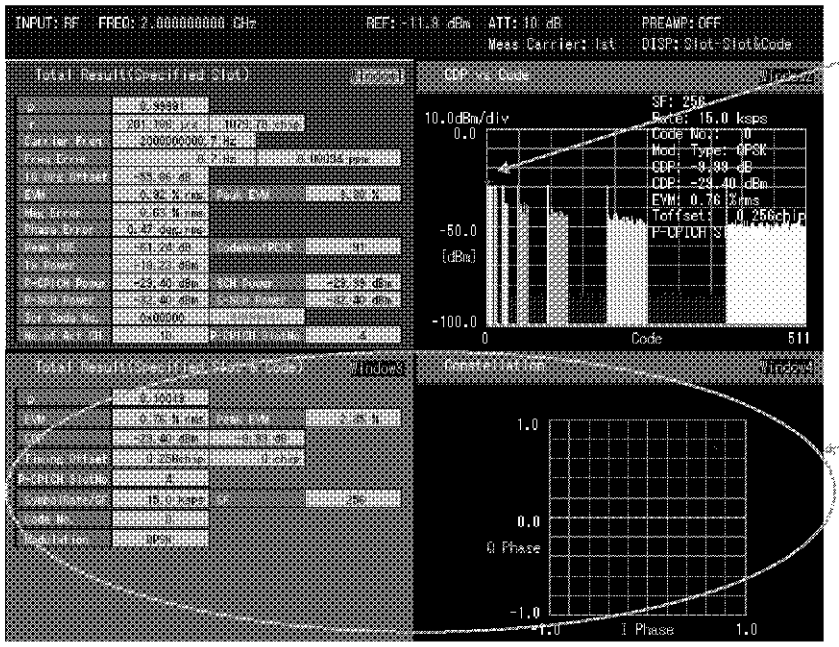


Figure A-6 Specified Slot & Code Screen (that displays the results of a specified slot in the upper two windows and the results of the specified slot and a specified code in the lower two windows (Downlink))

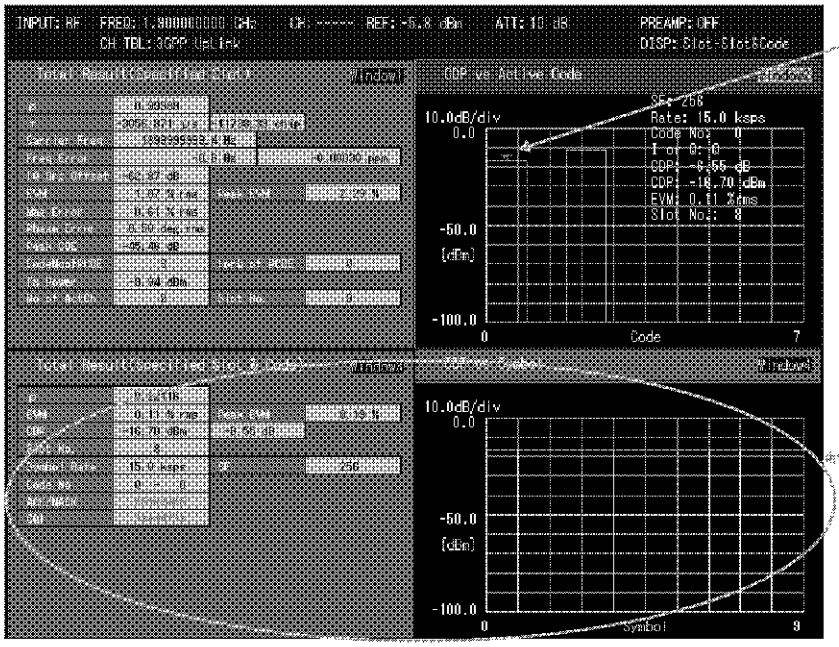


Figure A-7 Specified Slot & Code Screen (that displays the results of a specified slot in the upper two windows and the results of the specified slot and a specified code in the lower two windows (Uplink))

Specified Code

The **Specified Code** displays the measurement results of a specified code.

There are two combinations of separate windows.

- **Specified Code** — The results of all slots and all codes are displayed in the upper two windows.
  The results of a specified code are displayed in the lower two windows.
- **Specified Slot & Code** — The results of a specified code are displayed in the upper two windows.
  The results of a specified code and a specified slot are displayed in the lower two windows.

- **Specified Code**

  This screen displays the results of all slots and all codes in the upper two windows, and the results of a specified code in the lower two windows. The measurement results of the code, which is specified by a marker in the upper right window, are displayed in the lower two windows. This screen is useful when evaluating the measurement results of a specific code that is chosen from the results of all code measurements.

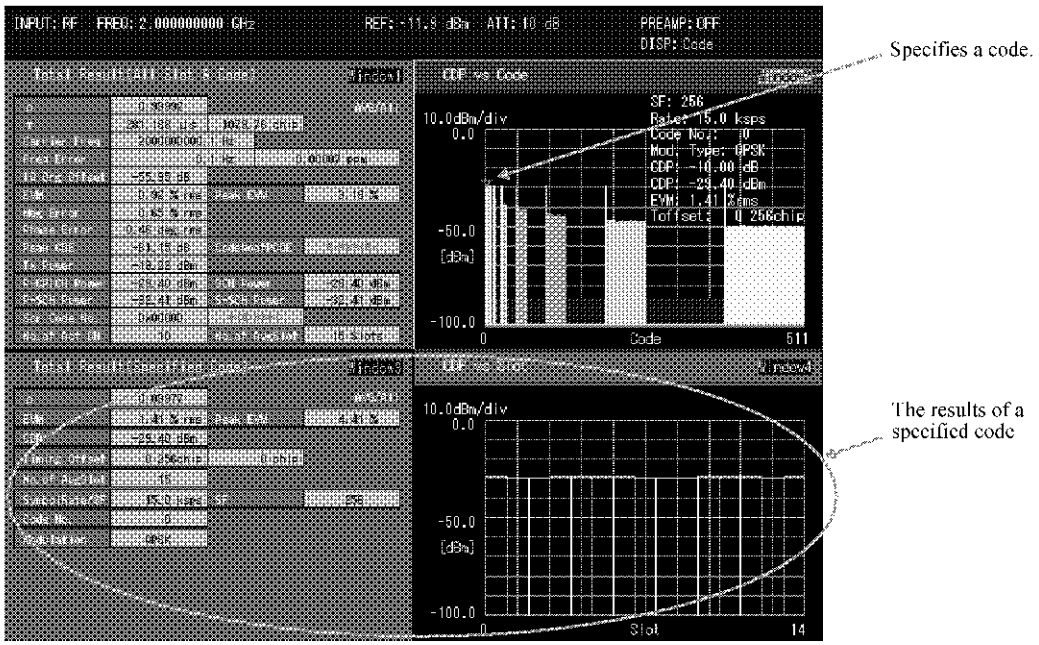


Figure A-8 Specified Code Screen (that displays the results of all slots and all codes in the upper two windows and the results of a specified code in the lower two windows (Downlink))

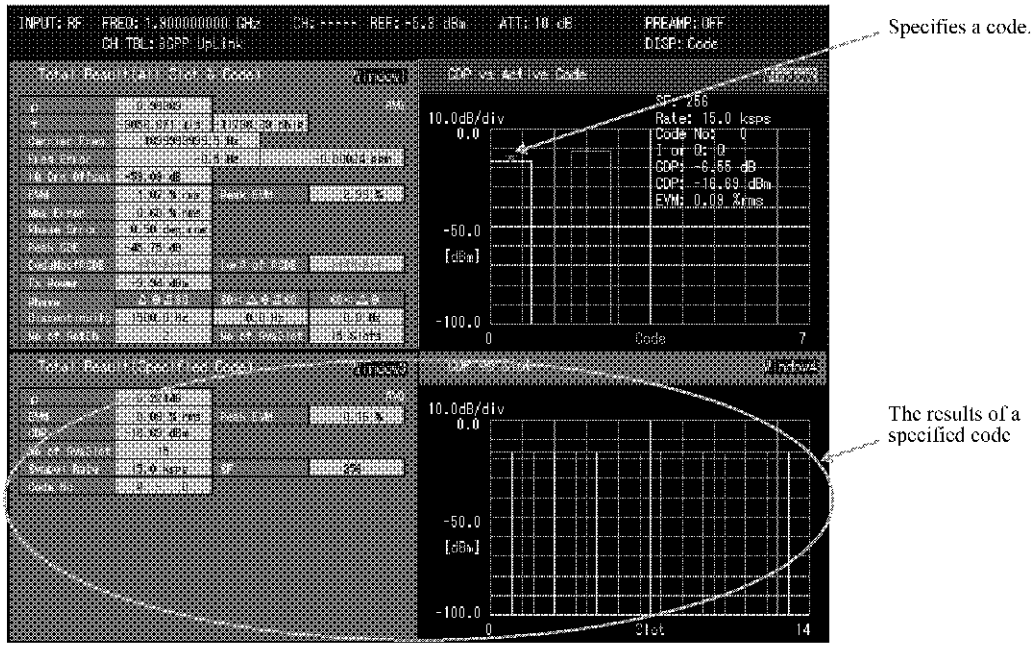


Figure A-9 Specified Code Screen (that displays the results of all slots and all codes in the upper two windows and the results of a specified code in the lower two windows (Uplink))

- **Specified Slot & Code**

  This screen displays the results of the code, which is specified by **Code No.** (Downlink), **Active Code No.** (Uplink) or **Rate Code No.** (Uplink), in the upper two windows, and the results of a specified slot and the specified code in the lower two windows. The measurement results of the slot, which is specified by a marker in the upper right window, are displayed in the lower two windows.

  This screen is useful when evaluating the measurement results of a specific slot that is chosen from the results of all slot measurements.

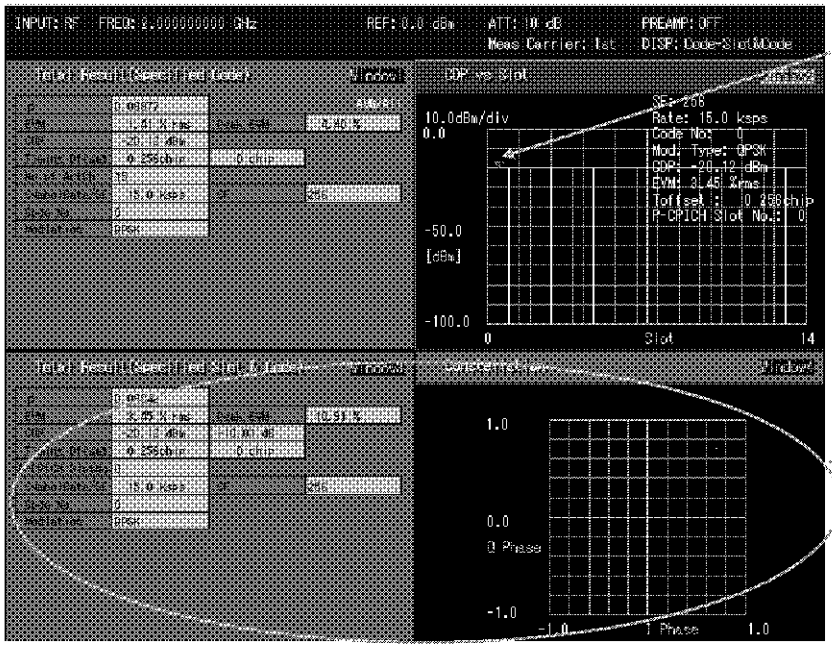


Figure A-10 Specified Slot & Code Screen (that displays the results of a specified code in the upper two windows and the results of a specified slot and the specified code in the lower two windows (Downlink))

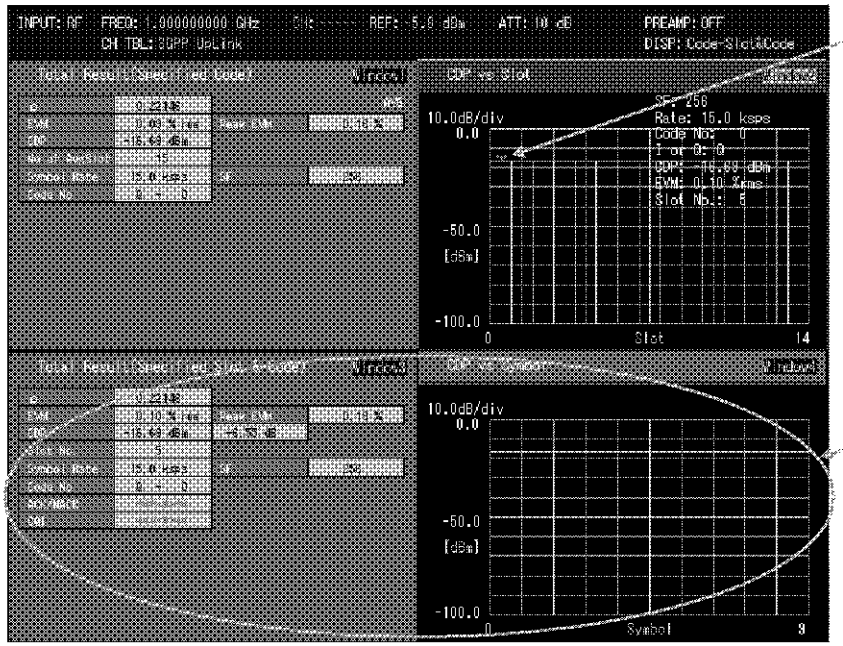


Figure A-11 Specified Slot & Code Screen (that displays the results of a specified code in the upper two windows and the results of a specified slot and the specified code in the lower two windows (Uplink))

A.1.6 Code Domain Power Graph (When Measuring the Base Station Signal)

The graphs of code domain power against the code are available in the Code Domain Mode. The following two types of bar graph are displayed at the same time.

- A bar graph in which the code domain power is analyzed as a active channel
- A bar graph in which the code domain power is analyzed as a symbol rate that is set in **[Analysis Rate]**

- A bar graph in which the code domain power is analyzed as a active channel

  This bar graph displays the code domain power that is calculated as a active channel. The bar graph is displayed in yellow. The active channel information can be determined by using the marker. Alternatively, it can be determined by using the following method:

  - Symbol rate (SF)

    The symbol rate can be determined by the color of a bar of the bar graph for **[Analysis Rate]**, which is situated at the position of a target bar of the bar graph for a active channel.

7.5 ksps (SF512)	Green
15 ksps (SF256)	Cyan
30 ksps (SF128)	Magenta
60 ksps (SF64)	Light blue
120 ksps (SF32)	Orange
240 ksps (SF16)	Dark green
480 ksps (SF8)	Pink
960 ksps (SF4)	Lemon

  - Code number

    Each code number can be determined by the position of a bar of the bar graph and can be obtained by using the following equation.

    [Code number] = [Horizontal axis position] × [Analysis Rate] / [Active channel rate]

- A bar graph in which the code domain power is analyzed as a symbol rate that is set in **[Analysis Rate]**

  This bar graph displays the code domain power that is calculated as a specified symbol rate. The symbol rate to be calculated is specified by the **[Analysis Rate]** of **Meas Parameters**. The color displayed depends on the corresponding active channel rate. The code at the position, where no active channel is provided, is displayed in blue. The number of codes that are displayed differs according to the set symbol rate as shown below:

7.5 ksps (SF512)	512
15 ksps (SF256)	256
30 ksps (SF128)	128
60 ksps (SF64)	64
120 ksps (SF32)	32
240 ksps (SF16)	16
480 ksps (SF8)	8
960 ksps (SF4)	4

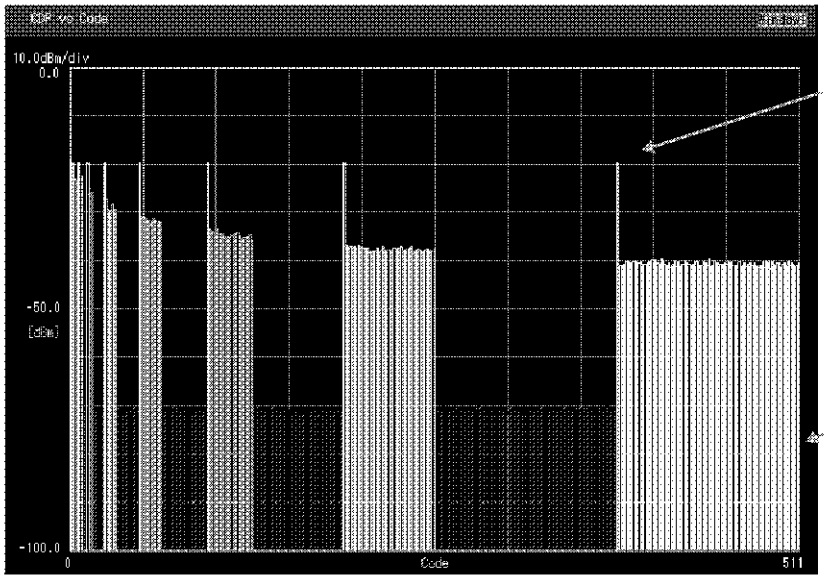


Figure A-12 Code Domain Power Measurement Example

A.1.7 Code Domain Power Graph (When Measuring the Mobile Station Signal)

The graphs of code domain power against the code are available in the Code Domain Mode. These graphs include the following two types of bar graph.

- A bar graph in which the code domain power is analyzed as a transmission channel
- Bar graphs in which the code domain power is analyzed as the symbol rate that is set in **[Analysis Rate]**

- Bar Graph in which the Code Domain Power is Analyzed as a Transmission Channel

  This bar graph displays the code domain power that is calculated as a transmission channel.

  The bar graph displays the following items from the left side:

DPCCH	... 15 ksps	No.0	Q side
HS-DPCCH	... 15 ksps	No.1 or 32 or 64	I side or Q side
$DPDCH_1$	... 15 ksps to 960 ksps	No.(SF/4)	I side
$DPDCH_3$	... 960 ksps	No.2	I side
$DPDCH_5$	... 960 ksps	No.3	I side
$DPDCH_2$	... 960 ksps	No.1	Q side
$DPDCH_4$	... 960 ksps	No.2	Q side
$DPDCH_6$	... 960 ksps	No.3	Q side

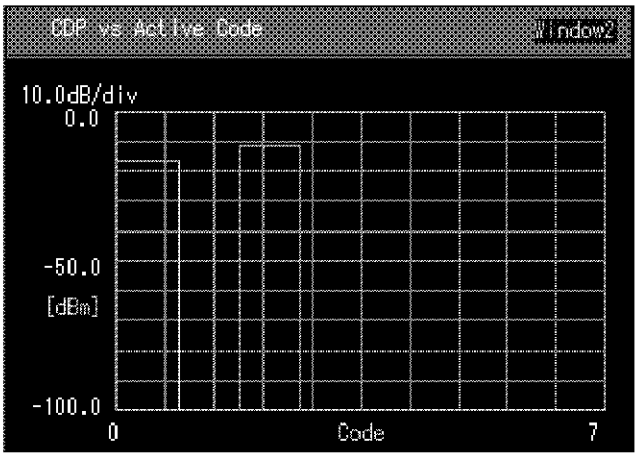


Figure A-13 Code Domain Power Measurement Example

- Bar Graphs in which the Code Domain Power is Analyzed as a Symbol Rate that is set in **[Analysis Rate]**

  These bar graphs display the code domain power that is calculated as a specified symbol rate.

  These graphs include two types: A graph for the I side and a graph for the Q side.

  The symbol rate to be calculated is specified by **[Analysis Rate]** of **Meas Parameters**.

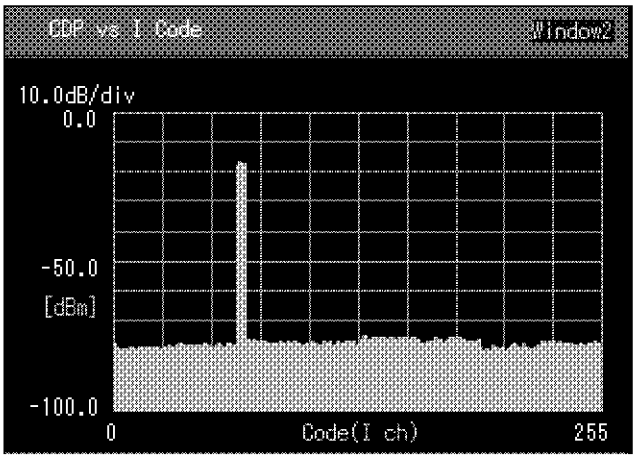


Figure A-14 Code Domain Power Measurement Example on the I Side

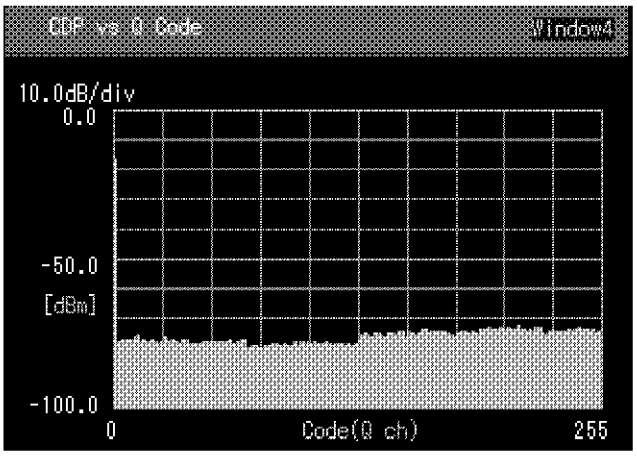


Figure A-15 Code Domain Power Measurement Example on the Q Side

A.1.8 How to Detect the Active Channel Information (When Measuring the Base Station Signal)

When the **[Active CH Detection]** of the **{MEAS SETUP}** **Meas Parameters** is set to **[AUTO]** and a measurement is executed, the active channel information is automatically detected. The active channel information detected includes the symbol rate, the code number and the modulation format. For this detection, the power of each code and the pilot symbol that is transmitted for each code are used.

A.1.9 Frequency Characteristics Correction Function

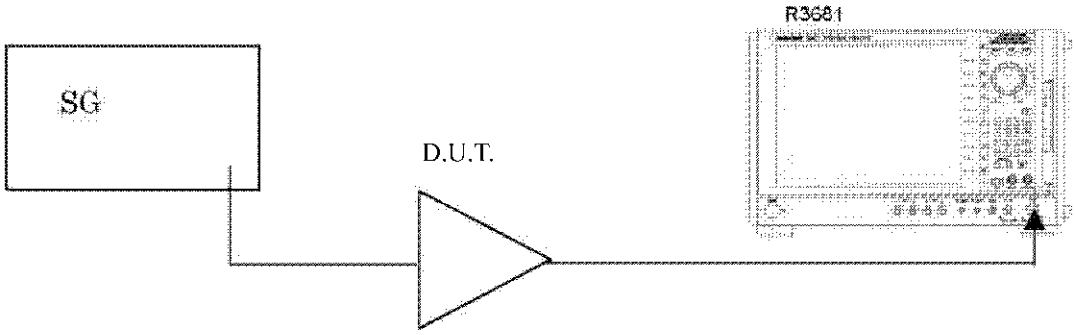
When the **[Make Filter]** button of **{MEAS SETUP}** **Meas Parameters** is pressed, the Equalizing Filter is created. The Equalizing Filter is a digital filter that minimizes the Error Vector Magnitude of the signal that is tested. Using this filter allows the frequency characteristics of the signal source to be corrected. By clicking **[USE]** and then executing a measurement, the measurement results, which have passed through the Equalizing Filter, can be obtained.

Use the Equalizing Filter as follows:

1. Connect the SG signal directly to the measuring instrument.

2. Set the **Meas Parameters** of **{MEAS SETUP}** and press the **SINGLE** button.
3. Verify that the measurement is performed correctly (EVM<17.5%rms) and press the **[Make Filter]** button.
4. Connect the DUT (Device Under Test), click **[USE]** and press the **SINGLE** button.

   The amount, by which the DUT caused the Error Vector Magnitude to increase, can be measured.



A.1.10 ACK/NACK,CQI Demodulation (When Setting the Mobile Station Signal)

ACK/NACK and CQI can be demodulated for HS-DPCCH in the Code Domain Mode.

The demodulated result is displayed after converting the data before Channel Coding to decimal.

Displays the demodulated result in the Total Result screen when HS-DPCCH is selected in the **Specified Slot & Code**.

If ACK/NACK and CQI are contained in the multiple slots, the result is displayed in all slots.

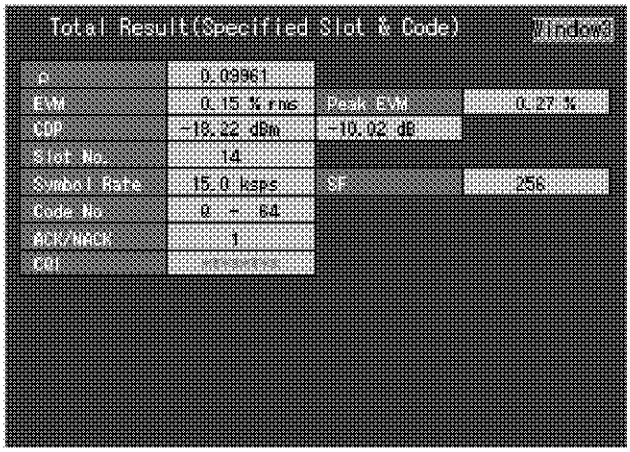


Figure A-16 Example of the ACK/NACK Display

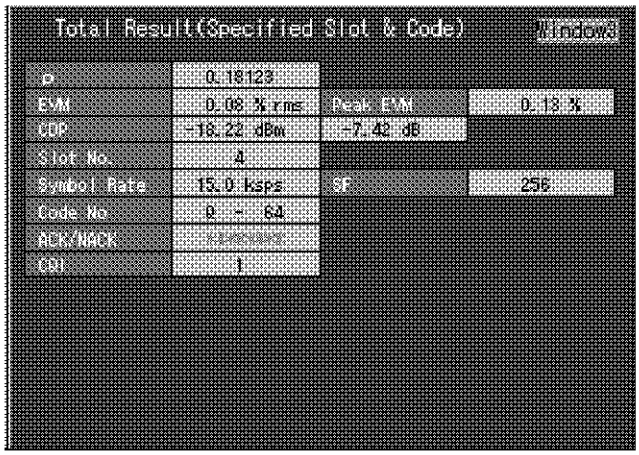


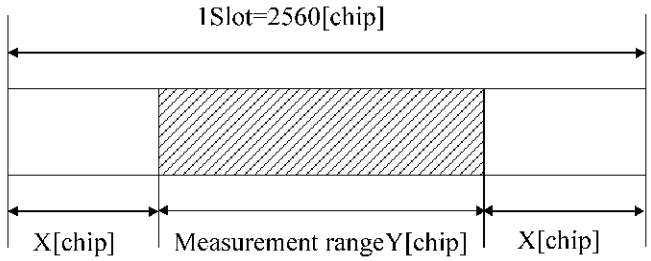
Figure A-17 Example of the CQI Display

A.1.11 A Function Which Can Change the Measurement Range (When the Mobile Station Signal Is Measured)

In the Concise mode and Code Domain mode that are used for the mobile station signal measurement, the number of chips, which is excluded from the measurement range, can be set.

The first and last chips of the slot are excluded by the set number from the measurement range.

[Excluding chips in slot boundary] 0, 1, ..., 96 [chip] The length of the chips that are excluded X [chip]



X: Setting value [chip]

Y: The measurement length[chip]
=2560 - 2 × X[chip]

A.1.12 A Function Which Saves the Demodulation Data (When the Base Station Signal Is Measured)

In the code Domain mode, the demodulation data from the specified one code can be saved.

The demodulation data can be saved by pressing the **Demod Data Save** key in either the following settings:

- When **Specified Slot** is selected from **{MEAS VIEW}**
- When **Specified Code** is selected from **{MEAS VIEW}**

The code, which is set in Specified Code (Active / Rate), Active Code No., and Rate Code No., is saved.

The code of the measurement length (Meas Length) is saved.

In the Downlink signal, the modulation format may vary depending on the slot (HS-PDSCH).

Therefore, the slots numbers, which are categorized by the QPSK and 16QAM modulation formats, are displayed.

The format is as follows:

```
*****Parameters*****
Setting
***** Results *****
Code information to be saved
<<< Demodulated Data >>>
Demodulation data
```

Example 1 When the measurement length is 1FRAME and the measurement channel is DPCH (30 ksps, Code No.9).

```
***** Parameters *****
2004/08/27  08:46:34
Link,Down Link
Input,RF
Center Freq[Hz],2000000000
Freq Offset[Hz],0
Ref Level[dBm],5.0
ATT[dB],0
Preamp,OFF
```

```
Ref Offset[dB],0.0
IQ Inverse,OFF
Meas Carrier,1st
Meas Length,1 FRAME
Carrier Frequency Offset[MHz],0.0
Scrambling Code Define,UNDEFINE
Scrambling Code No.(HEX),********
Scrambling Code No.(DEC),********
Scrambling Code No.(DEC(x16)),********
Scrambling Code Offset,********
Search Mode,SCH
Active CH. Detection,Auto Detection
SCH,ON
Threshold[dB],-30.0
Equalizing Filter,NOT USE
Specified Code,Active
Active Code No.,0
Rate Code No.,0
***** Results *****
Rate[ksps],15.0
SF,256
Code,0
QPSK Slot No.,0,1,2,3,4,5,6,7,8,9,10,11,12,13,14
16QAM Slot No.
<<< Demodulated Data >>>
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
```

A.1.13 A Function Which Saves the Demodulation Data (When the Mobile Station Signal Is Measured)

In the code Domain mode, the demodulation data from the specified one code can be saved.

The demodulation data can be saved by pressing the **Demod Data Save** key in either the following settings:

- When **Specified Slot** is selected from **{MEAS VIEW}**
- When **Specified Code** is selected from **{MEAS VIEW}**

The code, which is set in Specified Code (Active / Rate), Active Code No., Rate Code No., and Specified Rate Code (I / Q), is saved. The code of the measurement length (Meas Length) is saved.

The format is as follows:

```
*****Parameters*****
Setting
***** Results *****
Code information to be saved
<<< Demodulated Data >>>
Demodulation data
```

Example 1 When the measurement length is 1FRAME and the measurement channel is DPCCH (15 ksps, Code No.0, Q side).

```
***** Parameters *****
2004/08/27  08:46:09
Link,Up Link
Input,RF
Center Freq[Hz],1900000000
Freq Offset[Hz],0
Ref Level[dBm],5.0
ATT[dB],0
Preamp,OFF
Ref Offset[dB],0.0
Meas Length,1 FRAME
IQ Inverse,OFF
Scrambling Code No.,1
Excluding chips in slot boundary,96
Threshold[dB],-30.0
Equalizing Filter,NOT USE
Specified Code,Active
Active Code No.,0
Specified Rate Code,********
Rate Code No.,********
***** Results *****
Rate[ksps],15.0
SF,256
Code,0
I or Q,Q
<<< Demodulated Data >>>
1,1,1,1,1,0,0,0,0,0,1,0,0,1,1,0,0,0,1,1,1,0,1,1,0,1,0,0,0,0,1,0,0,1,0,0,0,0,1,1,
1,1,0,1,0,1,0,0,0,0,1,1,1,1,1,0,0,0,1,1,1,1,1,1,0,0,0,0,0,0,1,1,0,1,0,0,0,0,1,1,
1,0,1,1,1,0,0,0,0,0,1,1,1,1,1,1,0,0,1,1,1,0,1,1,0,1,0,0,0,0,1,1,0,1,1,1,0,0,1,1,
1,1,0,1,0,0,0,0,0,0,1,0,0,1,1,1,0,0,1,1,1,0,0,1,1,1,0,0,1,1,1,0,0,1,1,
```

A.1.14 QPSK Mode (When the Mobile Station Signal Is Measured)

The QPSK mode analyzes the measurement signal assuming it is either a QPSK signal or an HPSK signal.

- When Signal Type is **[QPSK]**.

  The measurement signal is analyzed assuming it is a QPSK signal.

  If the measurement length is less than 1280 chips, the carrier frequency error is measured in the range between the trigger and the 1280th chip.

  Therefore, if a burst signal is measured, the carrier frequency error may become larger.

- When Signal Type is **[HPSK]**.

  The measurement signal is analyzed assuming it is an HPSK signal.

  If the measurement length is less than 1280 chips, the range from the trigger to the 1280th chip is used for the rough estimation of the parameter.

  Therefore, any burst signal which is less that 1280 chips cannot be measured.

  Because the distance between the symbol points of the HPSK signal is shorter than that of the QPSK signal, the noise tolerance in the HPSK signal analysis mode is narrower than that in the QPSK signal analysis mode.

  The HPSK signal (QPSK signal) whose I and Q are the same amplitude cannot be measured in the HPSK signal analysis mode. Set Signal Type to QPSK and perform the measurement.

A.1.15 IQ Power Ratio (QPSK Mode)

IQ Power Ratio indicates | (real part of power) - (imaginary part of power) | [dB] that is acquired when the constellation is shifter by 45°.

A.2 Error Message List

This section describes the error messages displayed on this instrument.

The following information is included.

- Error number
- Displayed message
- Cause of generation and cancellation method

Table A-1 Error Message List (1 of 2)

Error number	Displayed message	Description
-1250	No such file or directory.	The file or directory does not exist. Check the file name or directory name.
-1251	Permission denied.	The file operation is prohibited. Check the drive name, file or directory name.
-1252	Not enough space on the disk.	Not enough free space. Delete all unnecessary files.
-1253	File read/write error.	An error occurred during file I/O. Check if there is sufficient disk space or the disk is write-protected.
-1300	Device is not ready.	No disk is inserted.
-1400	There is no data in the effective state.	The requested data is not defined.
-1500	Option required.	The specified option function is required.
-3210	Input Level is out of range. Check the Ref. Level.	The input signal level is out of the permitted range. Check the reference level or input signal level.
-3211	Auto Level Set cannot be succeed. Signal level is not stable.	Auto Level Set is not complete. Check to see if the input signal level is not constant or if the attenuator is set to manual.
-3234	Incorrect 1st Carrier User Table. Reset the channel SF and Number.	The combination of the code number and SF, which are set in the 1st Carrier User Table, is invalid. Check the settings.
-3235	Incorrect 2nd Carrier User Table. Reset the channel SF and Number.	The combination of the code number and SF, which are set in the 2nd Carrier User Table, is invalid. Check the settings.
-3236	Incorrect 3rd Carrier User Table. Reset the channel SF and Number.	The combination of the code number and SF, which are set in the 3rd Carrier User Table, is invalid. Check the settings.
-3237	Incorrect 4th Carrier User Table. Reset the channel SF and Number.	The combination of the code number and SF, which are set in the 4th Carrier User Table, is invalid. Check the settings.

Table A-1 Error Message List (2 of 2)

Error number	Displayed message	Description
-3250	Time Out! No Trigger Detected.	A trigger time out error occurred. Check the trigger settings.

ALPHABETICAL INDEX

[Symbol]

[Numerics]

[A]

[B]

[C]

[D]

[E]

[F]

[G]

[H]

[I]

[L]

[M]

[N]

[O]

[P]

[Q]

[R]

[S]

[T]

[U]

[W]

[X]

[Y]

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