MX269013A

GSM/EDGE Measurement Software

Operation Manual

Ninth Edition

- For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe operation), MS2830A Signal Analyzer Operation Manual (Mainframe operation), or MS2850A Signal Analyzer Operation Manual (Mainframe operation) and MX269013A GSM/EDGE Measurement Software Operation Manual (Operation). Please also refer to these documents before using the equipment.
- Keep this manual with the equipment.

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Symbols used in manual

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

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

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

Safety Symbols Used on Equipment and in Manual

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

- ⚠️ This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

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

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

- ⚠️ This indicates a note. The contents are described in the box.

- 🌐 These indicate that the marked part should be recycled.
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About This Manual

About this document

This operation manual is for MX269013A GSM/EDGE Measurement Software (Remote Control).

- Mainframe: Operation
- Mainframe: Remote Control
These describe basic operations, maintenance procedures, common functions and common remote functions of the signal analyzer.

- MX269013A GSM/EDGE Measurement Software Operation Manual (Operation)
This document describes the operation of MX269013A Measurement Software.

- MX269013A GSM/EDGE Measurement Software Operation Manual (Remote Control : This document)
This document describes the remote control of MX269013A GSM/EDGE Measurement Software Operation Manual.
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Chapter 1  Overview

This chapter provides an overview of the remote control of the MX269013A GSM/EDGE Measurement Software and MX269013A-001 EDGE Evolution Measurement Software (hereinafter, referred to as “this application”).

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Chapter 1  Overview

1.1 Overview

This application can be controlled from an external controller (PC) by remote control commands using the MS269x Series, MS2830A, and MS2850A Signal Analyzer. The remote control commands are defined by the SCPI format.

1.1.1 Interface

This instrument has GPIB, Ethernet, and USB interfaces for remote control. Those interfaces cannot be used at the same time.

The interface is automatically determined when a command is received at the start of communication. This instrument enters the remote state after the interface has been determined. At remote-interface operation, the front panel lamp lights; the lamp is off at local-interface operation.

Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer manual (Mainframe Remote Control)” for more details of the basic operations for remote control, such as interface setting.

1.1.2 Controlled Application

Two types of the remote control commands can be used with this instrument: commands that are commonly applied to this instrument or all the applications (hereinafter, referred to as, “Common command”), and the other commands unique to a specific application. Common commands can be executed at any time and do not depend on the currently controlled application. However, a command unique to a specific application can be executed at the controlled application. If it is executed at another application, the command is not executed or an error occurs.

In this instrument, multiple applications can be activated at the same time. Only one application resource can be executed per piece of hardware at one time. This application measures an input signal by using the resource of RF input. Thus, this application cannot be executed at the same time with another application using the same resource such as the signal analyzer function. In order to execute a function unique to the application by using remote control, you need to select this application while it has been activated. Furthermore, this application can be executed at the same time with another application that uses by itself a resource not used by this application, such as the Vector Signal Generator Option.
1.2 Basic Flow of Control

This section describes the basic remote control command programming operations for measuring GSM/EDGE signals.

Figure 1.2-1 shows the control flow for a basic test. Note the parameter settings for the measurement, type of measurement function, and measurement execution order, although the measurement order can be changed.

![Diagram]

**Figure 1.2-1  Basic Test Flow**

1. Initial Setting
   The communication interface is initialized, the communication mode is set, the application is activated/selected, and the parameter is initialized.

   ![Initial Setting]

2. Setting Basic Parameters
   The carrier frequency, input level and all other measurement parameters are set.

   ![Setting Basic Parameters]
Chapter 1  Overview

(3) Configuring Common Settings
Parameters common to the functions that this application executes, such as Modulation Analysis, Output RF Spectrum, and Power vs Time, are set. The parameters include the trigger, Signal Direction, and BTS Type.

1.2.3 Configuring Common Settings

(4) Modulation Analysis/Output RF Spectrum/Power vs Time
The measurement functions to be executed in this application are executed according to the order. First, select a measurement function. Next, set parameters such as trace/storage mode for each measurement function in order to execute the measurement and read out the measurement result.

1.2.4 Modulation Analysis
1.2.5 Output RF Spectrum
1.2.6 Power vs Time

1.2.1 Initial Setting

As part of the initial settings, perform the preparations for using the measuring instrument and the application. The following actions are included in the initial settings.

(1) Initializing Communication Interface
The remote control interface to be used is initialized so sending and receiving of commands can start. Refer to the instruction manual of the interface for details.

(2) Setting Language Mode and Response Format
The language mode and the response format used to communicate are set. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer manual (Mainframe Remote Control)” for details.

(3) Starting the Application
The application is started. The signal analyzer and spectrum analyzer applications can also be loaded (started).

(4) Selecting the Application
The target application is selected.

(5) Initialization
All parameters and states are reset at initialization.

(6) Setting Measurement Mode.
After initialization, the measurement mode is at continuous measurement one. To select the single measurement mode, switch it to the single measurement one.
1.2 Basic Flow of Control

![Diagram](image-url)

**Start**
- Initializing communication interface
- Setting language mode and response format
  - INST CONFIG
  - SYST:LANG SCPI
  - SYST:RES:MODE A

**Starting the application**
- SYST:APPL:LOAD GSM
- SYST:APPL:LOAD SIGANA
- SYST:APPL:LOAD SPECT

**Selecting the application**
- INST GSM

**Initialization**
- *RST
- *CLS

**Setting the measurement mode**
- INIT:CONT OFF

**End**

Figure 1.2.1-1 Initialization Flow and Command Example
1.2.2 Setting Basic Parameter

Set the parameters used in common for all measurements, such as carrier frequency and input level. The basic parameters include the following:

1. ARFCN/Carrier Frequency
2. Input Level (Reference Level • Attenuator)
3. Level Offset
4. Pre-Amp (Option)

Start

Setting the frequency
FREQ:CENT 1.945GHZ

Setting the input level
POW:RANG:ILEV -10.00DBM

Setting the level offset
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT ON
DISP:WIND:TRAC:Y:RLEV:OFFS 0.25DB

Setting the pre-amplifier (Option)
POW:GAIN OFF

End

Figure 1.2.2-1 Basic Parameter Setting Flow and Command Examples
1.2.3 Configuring Common Settings

Set the parameters used in common for the Modulation Analysis/Output RF Spectrum/Power vs Time measurement functions executed in this application. Unless specified, there is no specific parameter setting order.

(1) Trigger
   (a) Trigger Switch
   (b) Trigger Source
   (c) Trigger Slope
   (d) Trigger Delay
(2) Signal Direction
(3) Band
(4) Modulation
(5) RF Signal
(6) Burst Synch
(7) Active Slot Threshold
(8) Symbol Rotation
   Where Modulation is QPSK, and where RF Signal is Normal Burst.
(9) Measurement Offset
   Where Trigger Switch is On.
(10) Pulse Shaping
   Where Signal Direction is UL, and where RF Signal is Higher Symbol Rate Burst.
(11) Power Control Level
   Where Signal Direction is UL.
(12) BTS Type
   Where Signal Direction is DL.
(13) BTS Power Level
   Where Signal Direction is DL.
(14) SCPIR
   Where Modulation is AQPSK.
Start

Setting the Trigger
TRIG OFF

Setting the Signal Direction
RAD:DIR DL

Setting the Band
RAD:BAND PGSM

Setting the Modulation
RAD:MOD GMSK

Setting the RF Signal
RAD:SIGN NORM

Setting how to synchronize
RAD:BSYN AUTO
RAD:BSYN:BURS:THR -40.0
RAD:BSYN:SOFF HALF

For measuring transmission signals of base station
RAD:DEV:BASE NORM
RAD:DEV:BASE:PLEV 34

For measuring transmission signals of transmitter
RAD:SIG:PSH NARR
RAD:PCL 0

End

Figure 1.2.3-1  Flow of Common Settings for Measurement Functions and Command Examples
1.2.4 Modulation Analysis

This executes the Modulation Analysis function in the following order:

1. Select the measurement function.
2. Set the measurement parameters.
   The following parameters are only applied to Modulation Analysis:
   (a) Storage Mode
   (b) Storage Count
   (c) Average Type
       Where Modulation is 8PSK/QPSK/16QAM/32QAM/AQPSK.
3. Execute measurement and read out the result.
4. Set the display content.
   This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.
   (a) Trace
   (b) Scale
   (c) Marker
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**Figure 1.2.4-1  Flow of Modulation Analysis and Command Examples**

**Start**

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<td>EVM:AVER:COUN 10</td>
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</tr>
<tr>
<td>DISP:EVM:WIND2:TRAC:Y:RLEV 10</td>
</tr>
<tr>
<td>CALC:EVM:MARK:ACT CONS</td>
</tr>
<tr>
<td>CALC:EVM:MARK:POS 0.0</td>
</tr>
<tr>
<td>CALC:EVM:MARK:X?</td>
</tr>
<tr>
<td>CALC:EVM:MARK:Y?</td>
</tr>
<tr>
<td>CALC:EVM:MARK:ACT BOTT</td>
</tr>
<tr>
<td>CALC:EVM:MARK:POS 0.0</td>
</tr>
<tr>
<td>CALC:EVM:MARK:Y?</td>
</tr>
</tbody>
</table>

**End**
1.2.5 Output RF Spectrum

This executes the Output RF Spectrum function in the following order:

1. Select the measurement function.
2. Set the measurement parameter.
   The following parameters are only applied to Output RF Spectrum:
   (a) Select Mask
   (b) Mask Setup
   (c) Storage Mode
   (d) Storage Count
3. Execute measurement and read out the result.
4. Set the display content.
   This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.
   (a) Trace Mode
   (b) Unit
Chapter 1  Overview

Start

Selecting the measurement function
CONF:ORFS

Setting the measurement parameter
ORFS:LIST:SEL STAN

Executing the measurement and Reading out the measurement result
READ:ORFS?
STAT:ERR?

Setting the display (if necessary)
DISP:ORFS:VIEW MOD
DISP:ORFS:WIND:TRAC:Y:UNIT DBM
CALC:ORFS:MARK ON
CALC:ORFS:MARK:MOD:X 400KHZ
CALC:ORFS:MARK:Y?

End

Figure 1.2.5-1  Flow of Output RF Spectrum and Command Examples
1.2.6 Power vs Time

This executes the Power vs Time function in the following order:

1. Select the measurement function
2. Set the measurement parameter
   The following parameters are only applied to Power vs Time:
   a) Select Mask
   b) Mask Setup
   c) Storage Mode
   d) Storage Count
   e) Average Type
3. Execute measurement and read out the result.
4. Set the display content.
   This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.
   a) Trace Mode
   b) Unit
   c) Display Item
   d) Slot
   e) Marker
Chapter 1  Overview

Figure 1.2.6-1 Flow of Power vs Time and Command Examples
1.2.7 Burst Average Power Measurement

This executes the Burst Average Power in the following order:

(1) Select the application to use and the measurement function.
   The application switches to Signal Analyzer when Burst Average Power is selected. The basic parameter values are reflected in the Signal Analyzer. From this point, only the commands and queries available for Signal Analyzer can be used.

(2) Setting measurement parameters
   The following parameters apply only to the specific application selected.
   (a) Trigger
   (b) Time Length, Filter Type, Storage (Signal Analyzer)

(3) Executing measurement and querying the result

(4) Setting Contents to be Displayed
   This control is not required when simply reading out the measurement results by using the remote control, but is used to display the measurement results on the screen in the same way as during manual operation.

```
Start

Selecting the application and measurement function
CONF:FFT:BPOW

Setting the measurement parameter
TRIG ON

Executing the measurement and Reading out the measurement result
READ:BPOW?
STAT:ERR?

End
```

Figure 1.2.7-1 Flow of Burst Average Power measurement and Command Examples
1.3 Native Mode

In this instrument, the syntax/format types of the remote control commands are defined as "Language mode". The language mode has two modes: SCPI and Native.

(1) SCPI Mode
The SCPI mode processes commands conforming to the syntax/format defined in SCPI (ver1999.0). For programming, you can use the character string in long/short form format and can omit angled bracket ([ ]) definition character strings.

On the Configuration screen, the SCPI mode is automatically set after transmitting command \texttt{SYST:LANG SCPI}.

(2) Native Mode
The Native mode processes commands that are in this instrument’s own definition type. Unless otherwise specified, the character string of a command header is fixed. If application commands are defined only by the SCPI mode, character strings converted according to the conversion rules are the commands in the Native mode.

\textbf{Note:}

The \texttt{STATus:QUEStionable} and \texttt{STATus:OPERation} registers cannot be used, even when the corresponding commands are converted to Native–mode commands according to the conversion rules.

On the Configuration screen, the Native mode is automatically set after transmitting \texttt{SYST:LANG NAT}.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig1_3_1.png}
\caption{SCPI and Native modes}
\end{figure}
This application is only defined as the SCPI mode commands. You need to follow the conversion rules below in order to control this application by using the Native mode.

Conversion Rules:
(1) Move the numeric parameter in the program header of an SCPI command before the argument. Delete a numeric parameter which only has one value and can be deleted. Describe the argument if it cannot be deleted.

(2) Use the first node if multiple ones can be selected.

(3) Delete those layers which can be deleted.

(4) Alter all the long-formed characters into short-formed ones.

(5) Delete the colon mark (“:”) at the head.

Example 1:
To convert `:CALCulate:MARKer[1]|2[:SET]:CENTer` into a Native mode command.

(1) Move the numeric parameter in the program header before the argument.

```
:CALCulate:MARKer[1]|2[:SET]:CENTer
```

↓
```
:CALCulate:MARKer[:SET]:CENTer <integer>
```
(A numeric value (1 or 2) is put `<integer>`.)

(2) Delete the layers which can be deleted.

```
:CALCulate:MARKer[:SET]:CENTer <integer>
```

↓
```
:CALCulate:MARKer:CENTer <integer>
```

(3) Alter all the long-formed characters into short-formed ones.

```
:CALCulate:MARKer:CENTer <integer>
```

↓
```
:CALC:MARK:CENT <integer>
```

(4) Delete the colon mark (“:”) at the head.

```
:CALC:MARK:CENT <integer>
```

↓
```
CALC:MARK:CENT <integer>
```
Example 2:
To convert [:SENSe]:BPOWer|:TXPower[:STATe]? into a Native mode command.

(1) Use the first node if multiple ones can be selected.

[:SENSe]:BPOWer|:TXPower[:STATe]?
↓
[:SENSe]:BPOWer[:STATe]?

(2) Delete the layers which can be deleted.

[:SENSe]:BPOWer[:STATe]?
↓
:BPOWer?

(3) Alter all the long-formed characters into short-formed ones.

:BPOWer?
↓
:BPOW?

(4) Delete the colon mark (":") at the head.

:BPOW?
↓
BPOW?

Example 3:
To convert :FETCh:EVM[n] ? into a Native mode command.

(1) Move the numeric parameter in the program header before the argument.

:FETCh:EVM[n]?
↓
:FETCh:EVM? <integer>
(A numeric value is put in <integer>.)

(2) Alter all the long-formed characters into short-formed ones.

:FETCh:EVM? <integer>
↓
:FETC:EVM? <integer>

(3) Delete the colon mark (":") at the head.

:FETC:EVM? <integer>
↓
FETC:EVM? <integer>

(4) Set a numeric value to the argument.

:FETC:EVM? <integer>
↓
FETC:EVM? 1
1.4 Setting Numeric Program Data

The following character programs can be used for setting numeric program data (numeric parameter).

1. **DEFault**
   After **DEFault** has been set to numeric program data, the target parameter is set to the initial value.

2. **MINimum**
   After **MINimum** has been set to numeric program data, the target parameter is set to the minimum value.

3. **MAXimum**
   After **MAXimum** has been set to numeric program data, the target parameter is set to the maximum value.

In this application, **DEFault**, **MINimum**, and **MAXimum** can be used for the following parameters:

- **<numeric_value>**
- **<freq>**
- **<real>**
- **<rel_power>**
- **<integer>**
- **<rel_ampl>**
- **<time>**
Chapter 1  Overview
Chapter 2  SCPI Device Message Details

This chapter describes the detailed specifications of SCPI remote control commands for executing the functions of this application. The device messages are listed according to each function. Refer to the “MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Instruction Manual (Mainframe Remote Control)” for the detailed specifications of the IEEE488.2 common device messages and application common device messages.

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<td>2.8.12 Storage Count</td>
<td>2-108</td>
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<td>2.8.13 Unit</td>
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<td>2.8.14 Marker – On/Off</td>
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2.1 Selecting Application

Table 2.1-1 lists device messages for setup operations such as activating/selecting/initializing an application.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Application</td>
<td>:SYSTem:APPLication:LOAD GSM</td>
</tr>
<tr>
<td>Unload Application</td>
<td>:SYSTem:APPLication:UNLoad GSM</td>
</tr>
<tr>
<td>Application Switch</td>
<td>:INSTRument[:SELeCt] GSM</td>
</tr>
<tr>
<td></td>
<td>:INSTRument[:SELeCt]?</td>
</tr>
<tr>
<td>Application Status</td>
<td>:INSTRument:SYSTem GSM, [ACTive]</td>
</tr>
<tr>
<td></td>
<td>:INSTRument:SYSTem? GSM</td>
</tr>
<tr>
<td>Initialization</td>
<td>:INSTRument:DEFault</td>
</tr>
<tr>
<td></td>
<td>:SYSTem:PRESet</td>
</tr>
</tbody>
</table>
2.1.1 Loading Application

:SYSTem:APPLication:LOAD GSM

Load Application

Function

This command loads this application.

Command

:SYSTem:APPLication:LOAD GSM

Details

This function loads the installed application and registers it in the Application Switch menu.
This function is available when the control-targeted application is Config.

Example of Use

To load this application.

SYST:APPL:LOAD GSM

:SYSTem:APPLication:UNLoad GSM

Unload Application

Function

This command unloads this application.

Command

:SYSTem:APPLication:UNLoad GSM

Details

This function unloads the running application and removes it from the Application Switch menu.
This function is available when the control-targeted application is Config.

Example of Use

To unload this application.

SYST:APPL:UNL GSM
2.1.2 Selecting Application

:INSTrument[:SELect] GSM|CONFIG

Application Switch

Function

This command selects the control-targeted application.

Command

:INSTrument[:SELect] <apl_name>

Parameter

<table>
<thead>
<tr>
<th>&lt;apl_name&gt;</th>
<th>Application name</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSM</td>
<td>GSM</td>
</tr>
<tr>
<td>CONFIG</td>
<td>Config</td>
</tr>
</tbody>
</table>

Example of Use

To switch the control-targeted application into this one.

INST GSM
:INSTrument[:SELect]?

Application Switch Query

Function

This command reads out the control-targeted application.

Query

:INSTrument[:SELect]?

Response

<apl_name>

Parameter

<apl_name> Application name
  GSM  GSM
  CONFIG  Config

Example of Use

To read out the control-targeted application.

INST?
> GSM
:INSTRument:SYSTem GSM,[ACTive]|INACtive|MINimum

Application Switch And Window Status

Function

This command selects the control-targeted application by specifying the window status.

Command

:INSTRument:SYSTem <apl_name>,<window>

Parameter

- `<apl_name>` Application name
  - GSM This application
  - SIGANA Signal Analyzer
  - SPECT Spectrum Analyzer
  - CONFIG Config

- `<window>` Window status
  - ACTive Active status
  - INACtive Inactive status
  - MINimum Minimized

When omitted: Active status

Example of Use

To select this application window which is active.

INST:SYST GSM,ACT
2.1 Selecting Application

:INSTRument:SYSTem? GSM
Application Switch And Window Status Query

Function

This command reads out the application status.

Query

:INSTRument:SYSTem? <apl_name>

Response

<status>,<window>

Parameter

<apl_name> Application name
GSM GSM
SIGANA Signal Analyzer
SPECT Spectrum Analyzer
CONFIG Config

<status> Application status
CURR Executed and targeted for control
RUN Executed but not targeted for control
IDLE Loaded but not executed
UNL Not loaded

>window> Window status
ACTive Active status
INACTive Inactive status
MINimum Minimized
NON Window not displayed

Example of Use

To read out this application status.

INST:SYST? GSM
> CURR,ACT
2.1.3 Initialization

:INSTRument:DEFault

Preset Current Application

Function

This command initializes the setting and the status of the selected application.

Command

:INSTRument:DEFault

Example of Use

To initialize the setting and the status of the selected application.

INST:DEF

:SYSTem:PRESet

Preset Current Application

Function

This command initializes the setting and the status of the selected application.

Refer to :INSTRument:DEFault.

Example of Use

To initialize the setting and the status of the selected application.

SYST:PRES
2.2 Setting Basic Parameter

Table 2.2-1 lists device messages for setting the parameters commonly applied to this application, such as frequency and level.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARFCN</td>
<td>[:SENSe]:CHANnel:ARFCn &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:CHANnel:ARFCn?</td>
</tr>
<tr>
<td>Carrier Frequency</td>
<td>[:SENSe]:FREQuency:CENTer &lt;freq&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:FREQuency:CENTer?</td>
</tr>
<tr>
<td>Input Level</td>
<td>[:SENSe]:POWer[:RF]:RANGe:ILEVel &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:RANGe:ILEVel?</td>
</tr>
<tr>
<td>Level Offset</td>
<td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet &lt;rel_power&gt;</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?</td>
</tr>
<tr>
<td>Level Offset State</td>
<td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?</td>
</tr>
<tr>
<td>Auto Range</td>
<td>[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE</td>
</tr>
<tr>
<td>Pre-Amp State</td>
<td>[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:GAIN[:STATe]?</td>
</tr>
<tr>
<td>Lowest ATT Setting</td>
<td>[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing 0DB</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing?</td>
</tr>
</tbody>
</table>
2.2.1 ARFCN
[:SENSe]:CHANnel:ARFCn <integer>

ARFCN

Function
This command sets ARFCN.

Command
[:SENSe]:CHANnel:ARFCn <integer>

Parameter

<table>
<thead>
<tr>
<th>&lt;integer&gt;</th>
<th>ARFCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When Band is P-GSM: 1 to 124</td>
</tr>
<tr>
<td></td>
<td>When Band is E-GSM: 0 to 124, 975 to 1023</td>
</tr>
<tr>
<td></td>
<td>When Band is R-GSM: 0 to 124, 955 to 1023</td>
</tr>
<tr>
<td></td>
<td>When Band is GSM450: 259 to 293</td>
</tr>
<tr>
<td></td>
<td>When Band is GSM480: 306 to 340</td>
</tr>
<tr>
<td></td>
<td>When Band is GSM750: 438 to 511</td>
</tr>
<tr>
<td></td>
<td>When Band is GSM850: 128 to 511</td>
</tr>
<tr>
<td></td>
<td>When Band is DCS1800: 512 to 885</td>
</tr>
<tr>
<td></td>
<td>When Band is PCS1900: 512 to 810</td>
</tr>
<tr>
<td>Resolution</td>
<td>1</td>
</tr>
<tr>
<td>Suffix code</td>
<td>None</td>
</tr>
<tr>
<td>Default</td>
<td>1</td>
</tr>
</tbody>
</table>

Example of Use
To set 1 to ARFCN.
CHAN:ARFC 1
### [:SENSe]:CHANnel:ARFCn?

**ARFCN Query**

**Function**

This command reads out the ARFCN setting.

**Query**

[:SENSe]:CHANnel:ARFCn?

**Response**

<integer>

**Parameter**

<integer> ARFCN

Range

- When Band is P-GSM: 1 to 124
- When Band is E-GSM: 0 to 124, 975 to 1023
- When Band is R-GSM: 0 to 124, 955 to 1023
- When Band is GSM450: 259 to 293
- When Band is GSM480: 306 to 340
- When Band is GSM750: 438 to 511
- When Band is GSM850: 128 to 511
- When Band is DCS1800: 512 to 885
- When Band is PCS1900: 512 to 810

Resolution 1

Suffix code None

**Example of Use**

To read out the ARFCN setting.

CHAN:ARFC?

> 1
2.2.2 Carrier Frequency

[:SENSe]:FREQuency:CENTer <freq>

Carrier Frequency

Function

This command sets the carrier frequency of the measured signal.

Command

[:SENSe]:FREQuency:CENTer <freq>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;freq&gt;</td>
<td>Carrier frequency</td>
</tr>
<tr>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 Hz</td>
</tr>
<tr>
<td>Suffix code</td>
<td>HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ</td>
</tr>
<tr>
<td></td>
<td>Hz is used when omitted.</td>
</tr>
<tr>
<td>Default</td>
<td>935.2 MHz</td>
</tr>
</tbody>
</table>

Example of Use

To set the carrier frequency to 800 MHz.

FREQ:CENT 800MHZ
[:SENSe]:FREQuency:CENTer?
Carrier Frequency Query

Function
This command reads out the carrier frequency of the measured signal.

Query
[:SENSe]:FREQuency:CENTer?

Response
<freq>

Parameter
<freq>  
Carrier frequency
Range  10 MHz to upper limit of the main unit
Resolution  1 Hz
Value is returned in Hz units.

Example of Use
To read out the carrier frequency.

FREQ:CENT?
> 80000000.00
2.2.3 Input Level

[:SENSe]:POWer[:RF]:RANGe:ILEVel <real>

Input Level

Function

This command sets the input level of RF signal.

Command

[:SENSe]:POWer[:RF]:RANGe:ILEVel <real>

Parameter

<real>  Input level value

Range

When Pre Amp is Off:
(–60.00+Level Offset) to (30.00+Level Offset)

When Pre Amp is On:
(–80.00+Level Offset) to (10.00+Level Offset)

0.01 dB

Unit  1 dBm

Suffix code  DBM

dBm is used when omitted.

Default  –10.00 dBm

Details

The setting range when MS2690A/MS2691A/MS2692A-008 6 GHz
Preamplifier, MS2830A-008 Preamplifier, or MS2850A-068 Preamplifier
(hereinafter referred to as “Option 008”) is Off is applied, if the Option
008 is not installed.

Example of Use

To set the input level to –15.00 dBm.

POW:RANG:ILEV –15.00
[:S ENSe]:POWer[:RF]:R ANGe: I LEVel?
Input Level Query

Function

This command reads out the input level of RF signal.

Query

[:S ENSe]:POWer[:RF]:R ANGe: I LEVel?

Response

<real>

Parameter

<real> Input level value

Range

When Pre Amp is Off:
–60.00+Level Offset to (30.00+Level Offset)
When Pre Amp is On:
–80.00+Level Offset to (10.00+Level Offset)

Resolution 0.01 dB
Value is returned in dBm units.

Example of Use

To read out the input level.

POW:RANG:ILEV?
> -15.00
2.2.4 Level Offset

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>

**Level Offset**

**Function**

This command sets the offset value of the input level.

**Command**

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>

**Parameter**

- `<rel_power>`: Offset value
  - **Range**: –99.99 to 99.99 dB
  - **Resolution**: 0.01 dB
  - **Suffix code**: DB
  - dB is used when omitted.
  - **Default**: 0.00 dB

**Example of Use**

To set the offset value of the input level to +10 dB.

```
DISP:WIND:TRAC:Y:RLEV:OFFS 10
```

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?

**Level Offset Query**

**Function**

This command reads out the offset value of the input level.

**Query**

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?

**Response**

- `<rel_power>`

**Parameter**

- `<rel_power>`: Offset value
  - **Range**: –99.99 to 99.99 dB
  - **Resolution**: 0.01 dB

**Example of Use**

To read out the offset value of the input level.

```
DISP:WIND:TRAC:Y:RLEV:OFFS?
> 10.00
```
2.2.5 Level Offset State

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1

Level Offset State

Function

This command enables/disables the offset function of the input level.

Command

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe <switch>

Parameter

<switch> Level Offset State
  OFF|0 Disabled (Default)
  ON|1 Enabled

Example of Use

To enable the offset value of the input level.

DISP:WIND:TRAC:Y:RLEV:OFFS:STAT ON

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?

Level Offset State Query

Function

This command reads out whether the offset function of the input level is enabled/disabled.

Query

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?

Response

<switch>

Parameter

<switch> Level Offset State
  OFF|0 Disabled
  ON|1 Enabled

Example of Use

To read out whether the offset function of the input level is enabled/disabled.

> 1
2.2.6  Auto Range

[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE

Auto Range

Function

This command adjusts input level according to input signal.

Command

[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE

Details

This command is not available when the Replay function is executed.

Example of Use

To auto-adjust the level.

POW:RANG:AUTO ONCE
2.2 Setting Basic Parameter

2.2.7 Pre-Amp State

[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1

Pre-Amp State

Function

This command sets Pre-Amp to On/Off.

Command

[:SENSe]:POWer[:RF]:GAIN[:STATe] <switch>

Parameter

<switch>  Pre-Amp On/Off
OFF|0  Off (Default)
ON|1  On

Details

This command is disabled when the Option 008 is not installed.

Example of Use

To set Pre-Amp to On.

POW:GAIN ON
[:SENSe]:POWer[:RF]:GAIN[:STATe]?

Pre-Amp State Query

Function
This command reads out Pre-Amp On/Off.

Query
[:SENSe]:POWer[:RF]:GAIN[:STATe]?

Response
<switch>

Parameter
<switch>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Off</td>
</tr>
<tr>
<td>1</td>
<td>On</td>
</tr>
</tbody>
</table>

Details
Off is returned when the Option 008 is not installed.

Example of Use
To read out the Pre-Amp setting.

POW:GAIN?
> 1
2.2 Setting Basic Parameter

2.2.8 Lowest ATT Setting

[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing 0dB|4dB

Lowest ATT Setting

Function

This command sets the lowest attenuator value.

Command

[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing <mode>

Parameter

<mode>    lowest ATT Setting
          0DB        0 dB
          4DB        4 dB (Default)

Example of Use

To set the lowest attenuator setting to 0 dB.
POW:ATT:LOW:SETT 0DB

[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing?

Lowest ATT Setting Query

Function

This command queries the lowest attenuator value.

Query

[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing?

Response

<mode>

Parameter

<mode>    lowest ATT Setting
          0DB        0 dB
          4DB        4 dB

Example of Use

To query the lowest attenuator value.
POW:ATT:LOW:SETT?
>4DB
2.3 Setting System Parameter

Table 2.3-1 lists the device messages for setting the parameters on the communication system to be measured. These parameters are commonly applied to Modulation Analysis /Output RF Spectrum /Power vs Time.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Direction</td>
<td>[:SENSe]:RADio:SDIREction DL</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:SDIREction?</td>
</tr>
<tr>
<td>Band</td>
<td>[:SENSe]:RADio:BAND PGSM</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:BAND?</td>
</tr>
<tr>
<td>Modulation</td>
<td>[:SENSe]:RADio:MODulation GMSK</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:MODulation?</td>
</tr>
<tr>
<td>RF Signal</td>
<td>[:SENSe]:RADio:SIGNal NORMal</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:SIGNal?</td>
</tr>
<tr>
<td>Burst Sync</td>
<td>[:SENSe]:RADio:BSYNc AUTO</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:BSYNc?</td>
</tr>
<tr>
<td>Active Slot Threshold</td>
<td>[:SENSe]:RADio:BSYNc:BURSt:THReshold &lt;rel_power&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:BSYNc:BURSt:THReshold?</td>
</tr>
<tr>
<td>Symbol Rotation</td>
<td>[:SENSe]:RADio:BSYNc:SROTation 1PI2</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:BSYNc:SROTation?</td>
</tr>
<tr>
<td>Pulse Shaping</td>
<td>[:SENSe]:RADio:SIGNal:PSHaping NARrow</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:SIGNal:PSHaping?</td>
</tr>
<tr>
<td>Measurement Offset</td>
<td>[:SENSe]:RADio:BSYNc:MOFFset &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:BSYNc:MOFFset?</td>
</tr>
<tr>
<td>Power Control Level</td>
<td>[:SENSe]:RADio:PCLevel &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:PCLevel?</td>
</tr>
<tr>
<td>BTS Type</td>
<td>[:SENSe]:RADio:DEVice:BASE[:TYPE] NORMal</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:DEVice:BASE[:TYPE]?</td>
</tr>
<tr>
<td>BTS Power Level</td>
<td>[:SENSe]:RADio:DEVice:BASE:PLEVel &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:DEVice:BASE:PLEVel?</td>
</tr>
<tr>
<td>SCPIR</td>
<td>[:SENSe]:RADio:SCPir &lt;rel_power&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:RADio:SCPir?</td>
</tr>
</tbody>
</table>
2.3 Setting System Parameter

2.3.1 Signal Direction

[:SENSe]:RADio:SDIRection DL|UL

Signal Direction

Function

This command sets Signal Direction.

Command

[:SENSe]:RADio:SDIRection DL|UL

Parameter

<mode>

Signal Direction

DL

Downlink (Default)

UL

Uplink

Example of Use

To set Signal Direction to Uplink.

RAD:SDIR UL

[:SENSe]:RADio:SDIRection?

Signal Direction Query

Function

This command reads the setting value of Signal Direction.

Query

[:SENSe]:RADio:SDIRection?

Response

<mode>

Parameter

<mode>

Signal Direction

DL

Downlink

UL

Uplink

Example of Use

To read out the setting value of Signal Direction.

RAD:SDIR?

> UL
2.3.2 Band

[:SENSe]:RADio:BAND

PGSM|EGSM|RGSM|GSM450|GSM480|GSM750|GSM850|DCS1800|PCS1900

Band

Function

This command sets Band.

Command

[:SENSe]:RADio:BAND <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGSM</td>
<td>P-GSM (Default)</td>
</tr>
<tr>
<td>EGSM</td>
<td>E-GSM</td>
</tr>
<tr>
<td>RGSM</td>
<td>R-GSM</td>
</tr>
<tr>
<td>GSM450</td>
<td>GSM450</td>
</tr>
<tr>
<td>GSM480</td>
<td>GSM480</td>
</tr>
<tr>
<td>GSM750</td>
<td>GSM750</td>
</tr>
<tr>
<td>GSM850</td>
<td>GSM850</td>
</tr>
<tr>
<td>DCS1800</td>
<td>DCS1800</td>
</tr>
<tr>
<td>PCS1900</td>
<td>PCS1900</td>
</tr>
</tbody>
</table>

Example of Use

To set Band to PCS1900.

RAD:BAND PCS1900
2.3 Setting System Parameter

[:SENSe]:RADio:BAND?
Band Query

Function
This command reads out the setting value of Band.

Query
[:SENSe]:RADio:BAND?

Response
<mode>

Parameter
<mode>                Band
     PGSM             P-GSM
     EGSM             E-GSM
     RGSM             R-GSM
     GSM450           GSM450
     GSM480           GSM480
     GSM750           GSM750
     GSM850           GSM850
     DCS1800          DCS1800
     PCS1900          PCS1900

Example of Use
To read out the setting value of Band.

RAD:BAND?
> PCS1900
2.3.3 Modulation

[:SENSe]:RADio:MODulation GMSK|8PSK|QPSK|16Qam|32Qam|AQPSk

Modulation

Function

This command sets Modulation.

Command

[:SENSe]:RADio:MODulation <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Modulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMSK</td>
<td>GMSK (Default)</td>
</tr>
<tr>
<td>8PSK</td>
<td>8PSK</td>
</tr>
<tr>
<td>QPSK</td>
<td>QPSK</td>
</tr>
<tr>
<td>16Qam</td>
<td>16QAM</td>
</tr>
<tr>
<td>32Qam</td>
<td>32QAM</td>
</tr>
<tr>
<td>AQPSk</td>
<td>AQPSK</td>
</tr>
</tbody>
</table>

Details

QPSK/16QAM/32QAM can be selected when the MX269013A Option 001 EDGE Evolution Measurement Software (Option 001) is enabled.

AQPSK can be selected when Signal Direction is DL, and when RF Signal is Normal Burst or Continuous.

Example of Use

To set Modulation to GMSK.

RAD:MOD GMSK
[:SENSe]:RADio:MODulation?
Modulation Query

Function

This command reads out the setting value of Modulation.

Query

[:SENSe]:RADio:MODulation?

Response

<mode>

Parameter

<mode>                Modulation
GMSK                  GMSK (Default)
8PSK                  8PSK
QPSK                  QPSK
16Q                   16QAM
32Q                   32QAM
AQPS                  AQPSK

Example of Use

To read out the setting value of Modulation.

RAD:MOD?
> GMSK
2.3.4 RF Signal

[:SENSe]:RADio:SIGNal NORMal|HSRBurst|CONTinuous

RF Signal

Function

This command sets RF Signal.

Command

[:SENSe]:RADio:SIGNal <mode>

Parameter

<mode>           RF Signal
    NORM          Normal Burst
    HSRB          Higher Symbol Rate Burst
    CONT          Continuous

Details

Higher Symbol Rate Burst can be selected only when the Option 001 is enabled.

Example of Use

To set RF Signal to Normal Burst.

RAD:SIGN NORM
[:SENSe]:RADio:SIGNal?

RF Signal Query

Function

This command reads out the setting value of RF Signal.

Query

[:SENSe]:RADio:SIGNal?

Response

<mode>

Parameter

<mode> RF Signal
    NORM Normal Burst
    CONT Continuous
    HSRB Higher Symbol Rate Burst

Example of Use

To read out the setting value of RF Signal.

RAD:SIGN?
> NORM
2.3.5 Burst Sync
[:SENSe]:RADio:BSYNc
AUTO|TSC0|TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7

Burst Sync

Function
This command sets Burst Sync.

Command
[:SENSe]:RADio:BSYNc <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Burst Sync</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO</td>
<td>Auto (Default)</td>
</tr>
<tr>
<td>TSC0</td>
<td>TSC0</td>
</tr>
<tr>
<td>TSC1</td>
<td>TSC1</td>
</tr>
<tr>
<td>TSC2</td>
<td>TSC2</td>
</tr>
<tr>
<td>TSC3</td>
<td>TSC3</td>
</tr>
<tr>
<td>TSC4</td>
<td>TSC4</td>
</tr>
<tr>
<td>TSC5</td>
<td>TSC5</td>
</tr>
<tr>
<td>TSC6</td>
<td>TSC6</td>
</tr>
<tr>
<td>TSC7</td>
<td>TSC7</td>
</tr>
</tbody>
</table>

Example of Use

To set Burst Sync to Auto.

RAD:BSYN AUTO
[SENSe]:RADio:BSYNc?
Burst Sync Query

Function

This command reads out the setting value of Burst Sync.

Query

[:SENSe]:RADio:BSYNc?

Response

<mode>

Parameter

<mode>  Burst Sync.
AUTO    Auto
TSC0    TSC0
TSC1    TSC1
TSC2    TSC2
TSC3    TSC3
TSC4    TSC4
TSC5    TSC5
TSC6    TSC6
TSC7    TSC7

Example of Use

To read out the setting value of Burst Sync.

RAD:BSYN?
> AUTO
2.3.6 Active Slot Threshold

`:SENSe]:RADio:BSYNc:BURSt:THReshold <rel_power>
Active Slot Threshold

Function
This command sets Active Slot Threshold.

Command
`:SENSe]:RADio:BSYNc:BURSt:THReshold <rel_power>

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_power&gt;</th>
<th>Active Slot Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–40.0 to –10.0 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 dB</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DB</td>
</tr>
<tr>
<td></td>
<td>dB is used when omitted.</td>
</tr>
<tr>
<td>Default</td>
<td>–40.0 dB</td>
</tr>
</tbody>
</table>

Example of Use
To set Active Slot Threshold to –10.0 dB.
RAD:BSYN:BURS:THR –10.0

`:SENSe]:RADio:BSYNc:BURSt:THReshold?
Active Slot Threshold Query

Function
This command reads out the setting value of Active Slot Threshold.

Query
`:SENSe]:RADio:BSYNc:BURSt:THReshold?

Response

<table>
<thead>
<tr>
<th>&lt;rel_power&gt;</th>
</tr>
</thead>
</table>

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_power&gt;</th>
<th>Active Slot Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–40.0 to –10.0 dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 dB</td>
</tr>
</tbody>
</table>

Example of Use
To read out the setting value of Active Slot Threshold.
RAD:BSYN:BURS:THR?
> –10.0
2.3 Setting System Parameter

2.3.7 Symbol Rotation

[:SENSe]:RADio:BSYNc:SROTation 1PI2|1PI4|3PI8

Symbol Rotation

Function

This command sets the rotation phase of the symbol when RF Signal is Normal Burst and Modulation is QPSK.

Command

[:SENSe]:RADio:BSYNc:SROTation <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Symbol Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1PI2</td>
<td>π/2 (Default)</td>
</tr>
<tr>
<td>1PI4</td>
<td>π/4</td>
</tr>
<tr>
<td>3PI8</td>
<td>3π/8</td>
</tr>
</tbody>
</table>

Example of Use

To set Symbol Rotation to π/2.
RAD:BSYN:SROT 1PI4

[:SENSe]:RADio:BSYNc:SROTation?

Symbol Rotation Query

Function

This command returns the symbol rotation settings.

Query

[:SENSe]:RADio:BSYNc:SROTation?

Response

<mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Symbol Rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1PI2</td>
<td>π/2</td>
</tr>
<tr>
<td>1PI4</td>
<td>π/4</td>
</tr>
<tr>
<td>3PI8</td>
<td>3π/8</td>
</tr>
</tbody>
</table>

Example of Use

To query the symbol rotation settings.
RAD:BSYN:SROT?
> 1PI2
2.3.8 Pulse Shaping

[:SENSe]:RADio:SIGNal:PSHaping NARRow|WIDE

Pulse Shaping Filter

Function

This command sets Pulse Shaping. This function is available only when Signal Direction is Uplink and RF Signal is Higher Symbol Rate Burst.

Command

[:SENSe]:RADio:SIGNal:PSHaping NARRow|WIDE

Parameter

<mode>

Pulse Shaping
NARRow Narrow (Default)
WIDE Wide

Example of Use

To set Pulse Shaping to Narrow.
RAD:SIGN:PSH NARR

[:SENSe]:RADio:SIGNal:PSHaping?

Pulse Shaping Query

Function

This command reads out the setting value of Pulse Shaping.

Query

[:SENSe]:RADio:SIGNal:PSHaping?

Response

<mode>

Parameter

<mode>

Pulse Shaping
NARR Narrow
WIDE Wide

Example of Use

To read out the setting value of Pulse Shaping.
RAD:SIGN:PSH?
> NARR
2.3.9 Measurement Offset

[:SENSe]:RAdio:BSYNc:MOFFset <integer>

Measurement Offset

Function

This command sets Measurement Offset. This command sets Measurement Offset when the Trigger Switch parameter is On.

Command

[:SENSe]:RAdio:BSYNc:MOFFset <integer>

Parameter

<integer> Measurement Offset

Range 0 to 7
Resolution 1
Default 0

Example of Use

To set Measurement Offset to 0.

RAD:BSYN:MOFF 0

[:SENSe]:RAdio:BSYNc:MOFFset?

Measurement Offset Query

Function

This command reads out the Measurement Offset setting.

Query

[:SENSe]:RAdio:BSYNc:MOFFset?

Response

<integer>

Parameter

<integer> Measurement Offset

Range 0 to 7
Resolution 1

Example of Use

To read out the Measurement Offset setting.

RAD:BSYN:MOFF?

> 10
2.3.10 Power Control Level
[:SENSe]:RADio:PCLevel <integer>

Power Control Level

Function
This command sets Power Control Level.

Command
[:SENSe]:RADio:PCLevel <integer>

Parameter
<integer> Power Control Level
Range 0 to 31
Resolution 1
Suffix code None
Default 0

Example of Use
To set Power Control Level to 0.
RAD:PCL 0

[:SENSe]:RADio:PCLevel?
Power Control Level Query

Function
This command reads out the setting value of Power Control Level.

Query
[:SENSe]:RADio:PCLevel?

Response
<integer>

Parameter
<integer> Power Control Level
Range 0 to 31
Resolution 1
Suffix code None

Example of Use
To read out the setting value of Power Control Level.
RAD:PCL?
> 0
2.3.11 BTS Type

[:SENSe]:RADio:DEVice:BASE[:TYPE] NORMal|MICR1|MICR2|MICR3|PICO

BTS Type

Function

This command sets the BTS type when Signal Direction is Downlink.

Command

[:SENSe]:RADio:DEVice:BASE[:TYPE] <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>BTS type</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMal</td>
<td>Normal BTS (Default)</td>
</tr>
<tr>
<td>MICR1</td>
<td>Micro1 BTS</td>
</tr>
<tr>
<td>MICR2</td>
<td>Micro1 BTS</td>
</tr>
<tr>
<td>MICR3</td>
<td>Micro1 BTS</td>
</tr>
<tr>
<td>PICO</td>
<td>Pico BTS</td>
</tr>
</tbody>
</table>

Example of Use

To set the BTS type to Normal BTS.

RAD:DEV:BASE  NORM
[:SENSe]:RADio:DEVice:BASE[:TYPE]?

BTS Type Query

Function

This command reads out the setting value of the BTS type.

Query

[:SENSe]:RADio:DEVice:BASE[:TYPE]?

Response

<mode>

Parameter

<mode>  BTS type
NORM     Normal BTS
MICR1    Micro1 BTS
MICR2    Micro1 BTS
MICR3    Micro1 BTS
PICO     Pico BTS

Example of Use

To read out the setting of the BTS type.

RAD:DEV:BASE?
> NORM
### 2.3.12 BTS Power Level

[:SENSe]:RADio:DEVice:BASE:PLEVel <integer>

**BTS Power Level**

**Function**

This command sets BTS Power Level.

**Command**

[:SENSe]:RADio:DEVice:BASE:PLEVel <integer>

**Parameter**

<table>
<thead>
<tr>
<th>&lt;integer&gt;</th>
<th>BTS Power Level</th>
</tr>
</thead>
</table>

When BTS Type is Normal BTS:
- 34 to 46

When BTS Type is Micro1 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:
- 19 to 24

When BTS Type is Micro1 BTS, and when Band is DCS1800 or PCS1900:
- 27 to 32

When BTS Type is Micro2 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:
- 14 to 19

When BTS Type is Micro2 BTS, and when Band is DCS1800 or PCS1900:
- 22 to 27

When BTS Type is Micro3 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:
- 9 to 14

When BTS Type is Micro3 BTS, and when Band is DCS1800 or PCS1900:
- 17 to 22

When BTS Type is Pico BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:
- 13 to 20

When BTS Type is Micro2 BTS, and when Band is DCS1800 or PCS1900:
- 16 to 23
### Chapter 2  SCPI Device Message Details

<table>
<thead>
<tr>
<th>Resolution</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suffix code</td>
<td>DBM</td>
</tr>
<tr>
<td>dBm is used when omitted.</td>
<td></td>
</tr>
<tr>
<td>Default</td>
<td>46</td>
</tr>
</tbody>
</table>

**Example of Use**

To set BTS Power Level to 46 dBm.

```
RAD:DEV:BASE:PLEV 46
```

### [:SENSe]:RADio:DEVice:BASE:PLEVel?

**BTS Power Level Query**

**Function**

This command reads out the setting value of BTS Power Level.

**Query**

```
[:SENSe]:RADio:DEVice:BASE:PLEVel?
```

**Response**

```
<integer>
```

**Parameter**

```
<integer>  
BTS Power Level

Range

When BTS Type is Normal BTS:

34 to 46

When BTS Type is Micro1 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:

19 to 24

When BTS Type is Micro1 BTS, and when Band is DCS1800 or PCS1900:

27 to 32

When BTS Type is Micro2 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:

14 to 19

When BTS Type is Micro2 BTS, and when Band is DCS1800 or PCS1900:

22 to 27

When BTS Type is Micro3 BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:

9 to 14
```
2.3 Setting System Parameter

When BTS Type is Micro3 BTS, and when Band is DCS1800 or PCS1900:
   17 to 22
When BTS Type is Pico BTS, and when Band is P-GSM, E-GSM, R-GSM, GSM750 or GSM850:
   13 to 20
When BTS Type is Pico BTS, and when Band is DCS1800 or PCS1900:
   16 to 23

Resolution  1
Suffix code  None

Example of Use

To read out the setting of BTS Power Level.

RAD:DEV:BASE:PLEV?
> 46
2.3.13 SCPIR

[:SENSe]: RADio:SCPir <rel_power>

Function
This command sets SCPIR parameter of vamos signal.

Command
[:SENSe]: RADio:SCPir <rel_power>

Parameter
<rel_power>  SCPIR
    Range    -10.00 to 10.00 dB
    Resolution  0.01 dB
    Default    0.00 dB

Details
This function is available when the Modulation is AQPSK.

Example of Use
To set SCPIR to 10.00 dB.
RAD:SCP 10

[:SENSe]: RADio:SCPir?

SCPIR Query

Function
This command reads out the setting value of SCPIR.

Query
[:SENSe]: RADio:SCPir?

Response
<rel_power>

Parameter
<rel_power>  SCPIR
    Range    -10.00 to 10.00 dB
    Resolution  0.01 dB

Example of Use
To read out the setting value of SCPIR.
RAD:SCP?
> 10.00
2.4 Utility Function

Table 2.4-1 lists device messages for utility functions to be measured.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erase Warm Up Message</td>
<td>:DISPlay:ANNote:WUP:ERASe</td>
</tr>
<tr>
<td>Display Title</td>
<td>:DISPlay:ANNote:TITLe[:STATe] ON</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:ANNote:TITLe[:STATe]?</td>
</tr>
<tr>
<td>Title Entry</td>
<td>:DISPlay:ANNote:TITLe:DATA &lt;string&gt;</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:ANNote:TITLe:DATA?</td>
</tr>
</tbody>
</table>

2.4.1 Erase Warm Up Message

:DISPlay:ANNote:WUP:ERASe

Erase Warm Up Message

Function

This command erases the warm-up messages displayed right after activation.

Command

:DISPlay:ANNote:WUP:ERASe

Example of Use

To erase the warm-up messages.

DISP:ANN:WUP:ERAS
2.4.2 Display Title

:DISPlay:ANNotation:TITLe[:STATe] OFF|ON|0|1

Display Title

Function

This command displays/hides the title.

Command

:DISPlay:ANNotation:TITLe[:STATe] <switch>

Parameter

<switch> Title display On/Off
  OFF|0 Off (Default)
  ON|1 On

Example of Use

To display the title.

DISP:ANN:TITL ON

:DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function

This command reads out On/Off of the title display.

Query

:DISPlay:ANNotation:TITLe[:STATe]?

Response

<switch>

Parameter

<switch> Title display On/Off
  0 Off
  1 On

Example of Use

To read out the title display setting.

DISP:ANN:TITL?
> 1
2.4.3 Title Entry

`:DISPlay:ANNote:TITLE:DATA <string>`

**Title Entry**

**Function**

This command sets the title character string.

**Command**

`:DISPlay:ANNote:TITLE:DATA <string>`

**Parameter**

<string> Character string within 32 characters enclosed by double quotation marks (“”) or single quotation marks (’)

**Example of Use**

To set the title character string to TEST.

DISP:ANN:TITL:DATA ‘TEST’

`:DISPlay:ANNote:TITLE:DATA?`

**Title Entry Query**

**Function**

This command reads out the title character string.

**Query**

`:DISPlay:ANNote:TITLE:DATA?`

**Response**

<string>

**Parameter**

<string> Character string within 32 characters enclosed by double quotation marks (“”) or single quotation marks (’)

**Example of Use**

To read out the title character string.

DISP:ANN:TITL:DATA?

> TEST
2.5 Common Measurement Function

Table 2.5-1 lists device messages for carrying out common operations to all the measurement functions.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Measurement</td>
<td>::INITiate:CONTinuous OFF</td>
</tr>
<tr>
<td></td>
<td>::INITiate:CONTinuous?</td>
</tr>
<tr>
<td></td>
<td>::INITiate:MODE:CONTinuous</td>
</tr>
<tr>
<td>Single Measurement</td>
<td>::INITiate:MODE:SINGLE</td>
</tr>
<tr>
<td>Initiate</td>
<td>::INITiate[:IMMediate]</td>
</tr>
<tr>
<td>Configure</td>
<td>::CONFigure?</td>
</tr>
<tr>
<td>Trigger Switch</td>
<td>::TRIGger[:SEQUence][:STATE] ON</td>
</tr>
<tr>
<td></td>
<td>::TRIGger[:SEQUence][:STATE]?</td>
</tr>
<tr>
<td>Trigger Source</td>
<td>::TRIGger[:SEQUence]:SOURce EXTERNAL[1</td>
</tr>
<tr>
<td></td>
<td>::TRIGger[:SEQUence]:SOURce?</td>
</tr>
<tr>
<td>Trigger Slope</td>
<td>::TRIGger[:SEQUence]:SLOPe POSitive</td>
</tr>
<tr>
<td></td>
<td>::TRIGger[:SEQUence]:SLOPe?</td>
</tr>
<tr>
<td>Trigger Delay</td>
<td>::TRIGger[:SEQUence]:DELay &lt;time&gt;</td>
</tr>
<tr>
<td></td>
<td>::TRIGger[:SEQUence]:DELay?</td>
</tr>
</tbody>
</table>
2.5.1 Measurement and Control

:INITiate:CONTinuous OFF|ON|0|1

Continuous Measurement

Function

This command sets the measurement mode.

Command

:INITiate:CONTinuous <switch>

Parameter

<switch> Measurement mode
0|OFF Single measurement
1|ON Continuous measurement (Default)

Details

Continuous measurement starts when it is set to On, and no measurement starts when set to Off and in Single.

Example of Use

To execute continuous measurement.

INIT:CONT ON

:INITiate:CONTinuous?

Continuous Measurement Query

Function

This command reads out the measurement mode.

Query

:INITiate:CONTinuous?

Response

<switch>

Parameter

<switch> Measurement mode
0 Single measurement
1 Continuous measurement

Example of Use

To read out the measurement mode setting.

INIT:CONT?
> 0
Chapter 2  SCPI Device Message Details

:INITiate:MODE:CONTinuous
Continuous Measurement

Function
This command starts continuous measurement.

Command
:INITiate:MODE:CONTinuous

Example of Use
To execute continuous measurement.
INIT:MODE:CONT

:INITiate:MODE:SINGle
Single Measurement

Function
This command starts single measurement.

Command
:INITiate:MODE:SINGle

Example of Use
To execute single measurement.
INIT:MODE:SING

:INITiate[:IMMediate]
Initiate

Function
This command starts measurement in the measurement mode.

Command
:INITiate[:IMMediate]

Example of Use
To start measurement.
INIT
This command reads out the current measurement function.

Query
:CONFigure?

Response

Parameter

Example of Use
To read out the measurement function.

CONF?
2.5.2 Trigger Switch

:TRIGger[:SEQuence][:STATe] OFF|ON|0|1

Trigger Switch

Function

This command sets the trigger wait to On/Off.

Command

:TRIGger[:SEQuence][:STATe] <switch>

Parameter

<switch> Trigger wait On/Off
   OFF|0 On (Default)
   ON|1 Off

Example of Use

To set to the trigger wait.

TRIG ON

:TRIGger[:SEQuence][:STATe]?

Trigger Switch Query

Function

This command reads out On/Off of the trigger wait.

Query

:TRIGger[:SEQuence][:STATe]?

Response

<switch>

Parameter

<switch> Trigger wait On/Off
   0 On
   1 Off

Example of Use

To read out the trigger wait setting.

TRIG?
> 0
2.5.3 Trigger Source

:TRIGger[:SEQuence]:SOURce EXTernal[1|2]|EXT2|IMMediate|SG

Trigger Source

Function

This command selects the trigger signal source.

Command

:TRIGger[:SEQuence]:SOURce <source>

Parameter

<sourcE> Trigger Signal Source
EXTernal[1] External input(External)
EXTernal2|EXT2 External input 2(External 2)
IMMediate Free run
SG SG Marker

Details

SG marker can be selected only when the Vector Signal Generator Option is installed.
External input 2(External 2) is selectable only for MS2850A.

Example of Use

To set the trigger signal source to external input.

TRIG:SOUR EXT
:TRIGger[:SEQuence]:SOURce?

Trigger Source Query

Function

This command reads out the trigger signal source.

Query

:TRIGger[:SEQuence]:SOURce?

Response

<source>

Parameter

<source> Trigger Source
    EXT  External input (External)
    EXT2 External input 2 (External 2)
    IMM  Free run
    SG   SG Marker

Details

SG marker can be selected only when the Vector Signal Generator Option is installed.

Example of Use

To read out the trigger signal source.

TRIG:SOUR?
> EXT
2.5.4 Trigger Slope

:TRIGger[:SEQuence]:SLOPe POSitive|NEGative

Trigger Slope

This command sets the trigger detection mode (rising/falling).

Command

:TRIGger[:SEQuence]:SLOPe <mode>

Parameter

<mode> Trigger detection mode

POSitive Detects at the rising edge (Default).
NEGative Detects at the falling edge.

Example of Use

To detect a trigger at the rising edge.

TRIG:SLOP POS

:TRIGger[:SEQuence]:SLOPe?

Trigger Slope Query

This command reads out the trigger detection mode (rising/falling).

Query

:TRIGger[:SEQuence]:SLOPe?

Response

<mode>

Parameter

<mode> Trigger detection mode

POS Detects at the rising edge.
NEG Detects at the falling edge.

Example of Use

To read out the trigger detection mode.

TRIG:SLOP?
> POS
2.5.5 Trigger Delay

:TRIGger[:SEQuence]:DELay <time>

Trigger Delay

Function

This command sets the delay time from generating the trigger to the starting position of the frame.

Command

:TRIGger[:SEQuence]:DELay <time>

Parameter

<time> Delay time from generating the trigger to the starting position of the frame

- Range –2 to 2 s
- Resolution 50 ns
- Suffix code NS, US, MS, S
  s is used when omitted.
- Default 0 s

Example of Use

To set the trigger delay time to 20 ms.

TRIG:DEL 20MS
:TRIGger[:SEQuence]:DELay?
Trigger Delay Query

Function

This command reads out the setting of the delay time from generating the trigger to the starting position of the frame.

Query

:TRIGger[:SEQuence]:DELay?

Response

<time>

Parameter

<time> Delay time from generating the trigger to the starting position of the frame.
Range -2 to 2 s
Resolution 50 ns
Value is returned in s units.

Example of Use

To read out the trigger delay time.

TRIG:DEL?
> 0.02000000
Chapter 2  SCPI Device Message Details

2.6  Burst Average Power Measurement

Table 2.6-1 shows the device message that calls the Burst Average Power measurement function. The applications to be used (Signal Analyzer) must be loaded in advance.

Refer to the MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Signal Analyzer Function Remote Control for details of control commands and queries once the measurement functions are recalled.

Table 2.6-1  Burst Average Power function

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure · Burst Average Power</td>
<td>:CONFigure:FFT:BPOWer</td>
</tr>
</tbody>
</table>

*Note:* Except for the Modulation Analysis, Output RF Spectrum, Power vs Time measurement, FETCH:<measure>, INITiate:<measure>, READ:<measure>, and MEASURE:<measure> · these commands are not available when this application is selected. The commands/queries can be used when Signal Analyzers selected after executing CONFigure:<measure>.
**2.6 Burst Average Power Measurement**

**:CONFigure:FFT:BPOWer|:TXPower**

**Burst Average Power**

**Function**

This command selects Burst Average Power Measurement function.

**Command**

`:CONFigure:FFT:BPOWer|:TXPower`

**Details**

No measurement is made. Burst Average Power measurement function is available only for Signal Analyzer.

**Example of Use**

To select Burst Average Power measurement function for Signal Analyzer.

`CONF:FFT:BPOW`
2.7 Modulation Analysis

Table 2.7-1 lists device messages for Modulation Analysis.

Table 2.7-1  Device Messages for Executing Modulation Analysis and Reading Results.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>:CONFigure:EVM</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate:EVM</td>
</tr>
<tr>
<td>Fetch</td>
<td>:FETCH:EVM[n]?</td>
</tr>
<tr>
<td>Read</td>
<td>:READ:EVM[n]?</td>
</tr>
<tr>
<td>Measure</td>
<td>:MEASure:EVM[n]?</td>
</tr>
</tbody>
</table>
Table 2.7-2 lists responses to Parameter n on Table 2.7-1. –999.0 is returned when Result Mode is B.

### Table 2.7-2  Responses of Modulation Analysis Result

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or omitted</td>
<td>A</td>
<td>Responses are returned with comma-separated value formats in the following order:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Frequency Error [Hz] (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Frequency Error [Hz] (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Frequency Error [ppm] (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Frequency Error [ppm] (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Magnitude Error (RMS) [%]^2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Magnitude Error (RMS) [%]^2 (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Phase Error (RMS) [degree] (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Phase Error (RMS) [degree] (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Phase Error (Peak) [degree] *1 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Phase Error (Peak) [degree] *1 (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. EVM (RMS) [%]^2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. EVM (RMS) [%]^2 (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. EVM (Peak) [%]^2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. EVM (Peak) [%]^2 (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15. Origin Offset [dB] *2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17. 95-th percentile [%] *2 *3 (Calculated value for all Storage Counts)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18. Droop [nepers/s] *2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19. Droop [nepers/s] *2 (Maximum value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20. Droop [dB] *2 (Average value for Storage Count)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*1: Where Modulation is other than GMSK: –999.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*2: Where Modulation is GMSK: –999.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*3: This is calculated from symbol EVM included in all storages.</td>
</tr>
</tbody>
</table>

| 2         | A           | The EVM graph display data is returned with comma-separated value formats. |
|           |             | When RF Signal is Normal Burst or Continuous and Modulation is other than GMSK: 3 to 144 symbols (142) |
|           |             | When RF Signal is Higher Symbol Rate Burst: 4 to 172 symbols (169)        |
|           |             | Unit: %                                                                 |
|           |             | **Note**: When Modulation is GMSK: 1,471 symbols, –999.0                  |
Table 2.7-2  Responses of Modulation Analysis Result (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>A</td>
<td>The Magnitude Error graph display data is returned with comma-separated value formats. When RF Signal is Normal Burst or Continuous and Modulation is other than GMSK: 3 to 144 symbols (142) When RF Signal is Higher Symbol Rate Burst: 4 to 172 symbols (169) Unit: % Note: When Modulation is GMSK: 1,471 symbols, –999.0</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>The Phase Error graph display data is returned with comma-separated value formats. When Modulation is other than GMSK: 0.0 to 147.0 symbols (1471) When RF Signal is Normal Burst or Continuous and Modulation is other than GMSK: 3 to 144 symbols (142) When RF Signal is Higher Symbol Rate Burst: 3 to 171 symbols (169) Unit: degree</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>The Constellation graph display data is returned for each symbol, with a comma-separated value format and the I- and Q-phase data alternating. When Modulation is other than GMSK: 0.0 to 147.0 symbols (1471 × 2) When RF Signal is Normal Burst or Continuous and Modulation is other than GMSK: 3 to 144 symbols (142 × 2) When RF Signal is Higher Symbol Rate Burst: 4 to 172 symbols (169 × 2)</td>
</tr>
<tr>
<td>24</td>
<td>A</td>
<td>Responses are returned with comma-separated value formats in the following order: 1. Value of TSC on subchannel A*1 <em>2 2. Value of TSC on subchannel B</em>1 *2 When Modulation is AQPSK. • Value of TSC on subchannel A: 100 to 107 (If TSC detected) • Value of TSC on subchannel B: (1) If TSC set1 detected: 100 to 107 (2) If TSC set2 detected: 200 to 207 *1: If TSC not detected, returned value is –999.0 *2: Where Modulation is not AQPSK, returned value is –999.0</td>
</tr>
<tr>
<td>40</td>
<td>A</td>
<td>Responses are returned with comma-separated value formats in the following order: 1. 95th percentile [%]*2 *3 (Calculated value for all Storage Counts) 2. 95th percentile [%]*2 *4 (Average value for Storage Count) 3. 95th percentile [%]*2 *5 (Maximum value for Storage Count) *2: Where Modulation is GMSK: –999.0 *3: This is calculated from symbol EVM included in all storages. *4: This is the average value for each storage count. *5: This is the maximum value for each storage count.</td>
</tr>
</tbody>
</table>
### Table 2.7-3  Device Messages for Parameter Settings of Modulation Analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Mode</td>
<td>:DISPlay:EVM[:VIEW][:SELeCt] EVM</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM[:VIEW][:SELeCt]?</td>
</tr>
<tr>
<td>Scale – EVM</td>
<td>:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel 5</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel?</td>
</tr>
<tr>
<td>Scale – Magnitude Error</td>
<td>:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel 5</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel?</td>
</tr>
<tr>
<td>Scale – Phase</td>
<td>Error :DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 5</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?</td>
</tr>
<tr>
<td>Storage Mode</td>
<td>[:SENSe]:EVM:AVERage:[STATE] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:AVERage:[STATE]?</td>
</tr>
<tr>
<td>Storage Count</td>
<td>[:SENSe]:EVM:AVERage:COUNT &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:AVERage:COUNT?</td>
</tr>
<tr>
<td>Average Type</td>
<td>[:SENSe]:EVM:AVERage:TYPE POWER</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:AVERage:TYPE?</td>
</tr>
<tr>
<td>Droop – On/Off</td>
<td>[:SENSe]:EVM:DROop OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:EVM:DROop?</td>
</tr>
</tbody>
</table>

Table 2.7-4 lists device messages for setting Modulation Analysis and reading marker position values.

### Table 2.7-4  Device Message for Markers of Modulation Analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker – On/Off</td>
<td>:CALCulate:EVM:MARKer[:STATE] OFF</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:MARKer[:STATE]?</td>
</tr>
<tr>
<td>Active Trace</td>
<td>:CALCulate:EVM:MARKer:ACTive  CONStellation</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:MARKer:ACTive?</td>
</tr>
<tr>
<td>Marker X Axis Position</td>
<td>:CALCulate:EVM:MARKer:X:POSITION &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:EVM:MARKer:X:POSITION?</td>
</tr>
<tr>
<td>Marker X Axis Value</td>
<td>:CALCulate:EVM:MARKer:X?</td>
</tr>
<tr>
<td>Marker Y Axis Value</td>
<td>:CALCulate:EVM:MARKer:Y?</td>
</tr>
</tbody>
</table>
### 2.7.1 Measure

**:CONFigure:EVM**

Modulation Analysis

**Function**

This command selects Modulation Analysis.

**Command**

:CONFigure:EVM

**Details**

No measurement is performed.

**Example of Use**

To select Modulation Analysis.

CONF:EVM

**:INITiate:EVM**

Modulation Analysis

**Function**

This command executes Modulation Analysis.

**Command**

:INITiate:EVM

**Example of Use**

To execute Modulation Analysis.

INIT:EVM

**:FETCh:EVM[n]?**

Modulation Analysis Query

**Function**

This command reads out the measurement result of Modulation Analysis.

**Query**

:FETCh:EVM[n]?

**Response**

Refer to Table 2.7-2.

**Example of Use**

To read out the measurement result of Modulation Analysis.

FETC:EVM?
2.7 Modulation Analysis

:READ:EVM[n]?
Modulation Analysis Query

Function
This command reads out the result after executing Single measurement of Modulation Analysis by the current setting value.

Query
:READ:EVM[n]?

Response
Refer to Table 2.7-2.

Example of Use
To execute measurement in order to read out the measurement result of Modulation Analysis.

READ:EVM?

:MEASure:EVM[n]?
Modulation Analysis Query

Function
This command reads out the result after executing Single measurement of Modulation Analysis by the current setting value.

Query
:MEASure:EVM[n]?

Response
Refer to Table 2.7-2.

Example of Use
To execute measurement in order to read out the measurement result of Modulation Analysis.

MEAS:EVM?
2.7.2 Trace Mode

:DISPlay:EVM[:VIEW][:SELect] EVM|MAGNitude|PHASe

Trace Mode

Function

This command sets the graph type on the graph window when Modulation Analysis is selected.

Command

:DISPlay:EVM[:VIEW][:SELect] <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Trace Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVM</td>
<td>EVM</td>
</tr>
<tr>
<td>MAGNitude</td>
<td>Magnitude Error</td>
</tr>
<tr>
<td>PHASe</td>
<td>Phase Error (Default)</td>
</tr>
</tbody>
</table>

Example of Use

To set Trace Mode to Phase Error.

DISP:EVM PHAS

:DISPlay:EVM[:VIEW][:SELect]?

Trace Mode Query

Function

This command sets the graph type on the graph window when Modulation Analysis is selected.

Query

:DISPlay:EVM[:VIEW][:SELect]?

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Trace Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVM</td>
<td>EVM</td>
</tr>
<tr>
<td>MAGN</td>
<td>Magnitude Error</td>
</tr>
<tr>
<td>PHAS</td>
<td>Phase Error</td>
</tr>
</tbody>
</table>

Example of Use

To read out the Trace Mode setting.

DISP:EVM?
> PHAS
2.7.3 Scale – EVM

:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALE]:RLEVel 5|10|20|50

Scale – EVM

Function

This command sets the vertical-axis scale on the EVM graph. It is available, irrespective of the selected trace mode type.

Command

:DISPlay:EVM[:VIEW]:WINDow2:TRACe:Y[:SCALe]:RLEVel <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Vertical-axis scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5% (Default)</td>
</tr>
<tr>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>50</td>
<td>50%</td>
</tr>
</tbody>
</table>

Example of Use

To set the vertical-axis scale on the EVM graph to 10%.

DISP:EVM:WIN2:TRAC:Y:RLEV 10
:DISP:EV[:VIEW]:WIND:TRAC[:SCAL]:RLEV?

Scale – EVM Query

Function

This command reads out the setting of the vertical-axis scale on the EVM graph. It is available, irrespective of the selected trace mode type.

Query

:DISP:EV[:VIEW]:WIND:TRAC[:SCAL]:RLEV?

Response

<mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Vertical-axis scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>50</td>
<td>50%</td>
</tr>
</tbody>
</table>

Example of Use

To read out the setting of the vertical-axis scale on the EVM graph.

DISP:EV:WIND:TRAC[:SCAL]:RLEV?

> 10
2.7.4 Scale – Magnitude Error

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – Magnitude Error

Function

This command sets the vertical-axis scale on the Magnitude Error graph. It is available, irrespective of the selected trace mode type.

Command

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Vertical-axis scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>–5 to 5% (Default)</td>
</tr>
<tr>
<td>10</td>
<td>–10 to 10%</td>
</tr>
<tr>
<td>20</td>
<td>–20 to 20%</td>
</tr>
<tr>
<td>50</td>
<td>–50 to 50%</td>
</tr>
</tbody>
</table>

Example of Use

To set the vertical-axis scale on the Magnitude Error graph to 10%.

DISP:EVM:WIND3:TRAC:Y:RLEV 10
Chapter 2  SCPI Device Message Details

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel?
Scale – Magnitude Error Query

Function

This command reads out the vertical-axis scale on the Magnitude Error graph. It is available, irrespective of the selected trace mode type.

Query

:DISPlay:EVM[:VIEW]:WINDow3:TRACe:Y[:SCALe]:RLEVel?

Response

<mode>

Parameter

<mode>  Vertical-axis scale
  5     –5 to 5%
  10    –10 to 10%
  20    –20 to 20%
  50    –50 to 50%

Example of Use

To read out the setting of the vertical-axis scale on the Magnitude Error graph.

DISP:EVM:WIND3:TRAC:Y:RLEV?
> 10
2.7.5 Scale – Phase Error

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 5|10|20|50

Scale – Phase Error

Function

This command sets the vertical-axis scale on the Phase Error graph. It is available, irrespective of the selected trace mode type.

Command

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel <mode>

Parameter

<table>
  <tr><td><mode></td><td>Vertical-axis scale</td></tr>
  <tr><td>5</td><td>–5 to 5 degree (Default)</td></tr>
  <tr><td>10</td><td>–10 to 10 degree</td></tr>
  <tr><td>20</td><td>–20 to 20 degree</td></tr>
  <tr><td>50</td><td>–50 to 50 degree</td></tr>
</table>

Example of Use

To set the vertical-axis scale on the Phase Error graph to 10 degree.

DISP:EVM:WIND4:TRAC:Y:RLEV 10
**Function**

This command reads out the vertical-axis scale on the Phase Error graph. It is available, irrespective of the selected trace mode type.

**Query**

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?

**Response**

<mode>

**Parameter**

<mode> Vertical-axis scale
5 -5 to 5 degree
10 -10 to 10 degree
20 -20 to 20 degree
50 -50 to 50 degree

**Example of Use**

To read out the setting of the vertical-axis scale on the Phase Error graph.

DISP:EVM:WIND4:TRAC:Y:RLEV?
> 10
2.7.6 Storage Mode

[:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2

Storage Mode

Function

This command sets Storage Mode.

Command

[:SENSe]:EVM:AVERage[:STATe] <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Storage Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>0</td>
</tr>
<tr>
<td>ON</td>
<td>1</td>
</tr>
<tr>
<td>AMAXimum</td>
<td>2</td>
</tr>
</tbody>
</table>

Example of Use

To set Storage Mode to Average.

EVM:AVER ON

[:SENSe]:EVM:AVERage[:STATe]?

Storage Mode Query

Function

This command reads out the Storage Mode setting.

Query

[:SENSe]:EVM:AVERage[:STATe]?

Response

<mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Storage Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Off</td>
</tr>
<tr>
<td>1</td>
<td>Average</td>
</tr>
<tr>
<td>2</td>
<td>Average &amp; Max</td>
</tr>
</tbody>
</table>

Example of Use

To read out the Storage Mode setting.

EVM:AVER?

> 1
2.7.7 Storage Count

[:SENSe]:EVM:AVERage:COUNt <integer>

Storage Count

Function

This command sets the Storage Count.

Command

[:SENSe]:EVM:AVERage:COUNt <integer>

Parameter

<integer> Storage Count
  Range  2 to 9999
  Resolution  1
  Default  2

Example of Use

To set Storage Count to 10.

EVM:AVER:COUN 10

[:SENSe]:EVM:AVERage:COUNt?

Storage Count Query

Function

This command reads out the setting of the Storage Count.

Query

[:SENSe]:EVM:AVERage:COUNt?

Response

<integer>

Parameter

<integer> Storage Count
  Range  2 to 9999
  Resolution  1

Example of Use

To read out the Storage Count setting.

EVM:AVER:COUN?

> 10
2.7.8 Average Type

[:SENSe]:EVM:AVERage:TYPE POWER|LOGPower

Average Type

Function

This command sets Average Type.

Command

[:SENSe]:EVM:AVERage:TYPE <mode>

Parameter

<mode> Average Type
POWer Power (Default)
LOGPower Log-Power

Example of Use

To set Average Type to Power.

EVM:AVER:TYPE POW

[:SENSe]:EVM:AVERage:TYPE?

Average Type Query

Function

This command reads out the Average Type setting.

Query

[:SENSe]:EVM:AVERage:TYPE?

Response

<mode>

Parameter

<mode> Average Type
POW Power
LOGP Log-Power

Example of Use

To read out the Average Type setting.

EVM:AVER:TYPE?
> POW
2.7.9 Droop – On/Off

[:SENSe]:EVM:DROop OFF|ON|0|1

Droop – On/Off

Function

This command sets Droop.

Command

[:SENSe]:EVM:DROop <switch>

Parameter

<table>
<thead>
<tr>
<th>&lt;switch&gt;</th>
<th>Droop</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OFF</td>
</tr>
<tr>
<td>1</td>
<td>ON (Default)</td>
</tr>
</tbody>
</table>

Example of Use

To set Droop to On.

EVM:DRO 1

[:SENSe]:EVM:DROop?

Droop – On/Off Query

Function

This command sets the Droop setting.

Query

[:SENSe]:EVM:DROop?

Response

<switch>

Parameter

<table>
<thead>
<tr>
<th>&lt;switch&gt;</th>
<th>Droop</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Off</td>
</tr>
<tr>
<td>1</td>
<td>On</td>
</tr>
</tbody>
</table>

Example of Use

To read out the Droop setting.

EVM:DRO?

> 1
2.7.10 Marker – On/Off

:CALCulate:EVM:MARKer[:STATe] OFF|ON|0|1

Marker – On/Off

Function

This command displays/hides the marker when Modulation Analysis is selected.

Command

:CALCulate:EVM:MARKer[:STATe] <switch>

Parameter

<switch> Marker
0 | OFF
1 | ON

Example of Use

To display the marker.

CALC:EVM:MARK 1

:CALCulate:EVM:MARKer[:STATe]?

Marker – On/Off Query

Function

This command reads out Marker on/off when Modulation Analysis is selected.

Query

:CALCulate:EVM:MARKer[:STATe]?

Response

<switch>

Parameter

<switch> Marker
0 | Off (Default)
1 | On

Example of Use

To read out the marker setting.

CALC:EVM:MARK?
> 1
2.7.11 Active Trace

:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom

Active Trace

Function

This command sets the setting-targeted graph (position) of the marker.

Command

:CALCulate:EVM:MARKer:ACTive <mode>

Parameter

<mode>  Active Trace
        CONStellation  Constellation
        BOTTom        Graph window (Default)

Example of Use

To operate the marker on Constellation.

CALC:EVM:MARK:ACT CONS

:CALCulate:EVM:MARKer:ACTive?

Active Trace Query

Function

This command reads out the Active Trace setting.

Query

:CALCulate:EVM:MARKer:ACTive

Response

<mode>

Parameter

<mode>  Active Trace
        CONS    Constellation
        BOTT    Graph window

Example of Use

To read out the Active Trace setting.

CALC:EVM:MARK:ACT?
> CONS
2.7.12 Marker Position

:CALCulate:EVM:MARKer:X:POSition <real>

Marker X Axis Position

Function

This command sets the graph marker position of Active Trace in symbol units.

Command

:CALCulate:EVM:MARKer:X:POSition <real>

Parameter

<real> Marker position

Range

When RF Signal is Normal Burst or Continuous:
- 0.0 to 147.0 (GMSK)
- 3 to 144 (8PSK/QPSK/16QAM/32QAM)

When RF Signal is Higher Symbol Rate Burst or Higher Symbol Rate Continuous:
- 4 to 172

Resolution
- 0.1 symbol (GMSK)
- 1 symbol (8PSK/QPSK/16QAM/32QAM)

Suffix code None

Default 0.0

Example of Use

To set the graph marker position to 12.0.

CALC:EVM:MARK:X:POS 12.0
:CALCulate:EVM:MARKer:X:POSition?
Marker X Axis Position Query

Function
This command reads out the graph marker position of Active Trace in symbol units.

Query
:CALCulate:EVM:MARKer:X:POSition?

Response
<real>

Parameter
<real> Marker position

Range
When RF Signal is Normal Burst or Continuous:
0.0 to 147.0 (GMSK)
3 to 144 (8PSK/QPSK/16QAM/32QAM)
When RF Signal is Higher Symbol Rate Burst or Higher Symbol Rate Continuous:
4 to 172

Resolution
0.1 symbol (GMSK)
1 symbol (8PSK/QPSK/16QAM/32QAM)

Example of Use
To read out the setting of the graph marker position.

CALC:EVM:MARK:X:POS?
> 12.0
2.7.13 Marker Value

:CALCulate:EVM:MARKer:X?
Marker X Axis Value – Query

Function

This command reads out the value of the X axis (I phase) at the marker position on Constellation.

Query

:CALCulate:EVM:MARKer:X?

Response

<real>

Parameter

<real> X axis at marker position on Constellation (I phase)

Example of Use

To read out the X axis at the Constellation marker position.

CALC:EVM:MARK:X?
> 0.1234
Chapter 2  SCPI Device Message Details

:CALCulate:EVM:MARKer:Y?
Marker Y Axis Value – Query

Function

This command reads out the Y-axis value at the graph marker.

Query

:CALCulate:EVM:MARKer:Y?

Response

<real>

Parameter

<real>  Y axis at the graph marker position
When Active Trace is Constellation:
  Constellation (Q phase)  No unit

When Active Trace is Bottom:
  EVM  Unit: %
  Magnitude Error  Unit: %
  Phase Error  Unit: degree

Example of Use

To read out the Y axis at the marker position.

CALC:EVM:MARK:Y?
> 0.1234
## 2.8 Output RF Spectrum

Table 2.8-1 lists device messages for Output RF Spectrum.

### Table 2.8-1 Device Messages for Executing Measurement and Reading Result of Output RF Spectrum

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>:CONFigure:ORFSpectrum</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate:ORFSpectrum</td>
</tr>
<tr>
<td>Fetch</td>
<td>:FETCH:ORFSpectrum[n]?</td>
</tr>
<tr>
<td>Read</td>
<td>:READ:ORFSpectrum[n]?</td>
</tr>
<tr>
<td>Measure</td>
<td>:MEASure:ORFSpectrum[n]?</td>
</tr>
</tbody>
</table>
Table 2.8-2 lists responses corresponding to parameter n in Table 2.8-1. –999.0 is returned when Result Mode is set to B.

Table 2.8-2  Responses for Output RF Spectrum Results

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or omitted</td>
<td>A</td>
<td>This returns the final judgment for the mask per Modulation/Switching. “0” indicates “Pass”, “1” indicates “Failure”, and “2” indicates “Not judged”. If no judgment has been made, the judgment result is –999.0. 1. Modulation final judgment  2. Switching final judgment</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>The Modulation Analysis results are returned by offset frequencies in the following order, in comma-separated value format. For the mask judgment results, “0” indicates “Pass,” “1” indicates “Failure,” and “2” indicates “Not judged.” If no judgment is made, the judgment result is –999.0. For the judgment criterion, ABS, REL, or OFF is returned. 1. Offset frequency 1 [Hz] 2. Offset frequency 1 – Judgment result 3. Offset frequency 1 – Limit [dB] or [dBm] 4. Offset frequency 1 – Judgment criterion ••• 49. Offset frequency 13 [Hz] 50. Offset frequency 13 – Judgment result 51. Offset frequency 13 – Limit [dB] or [dBm] 52. Offset frequency 13 – Judgment criterion</td>
</tr>
</tbody>
</table>


### Table 2.8-2  Responses for Output RF Spectrum Results (Cont’d)

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 4  | A           | The Switching measurement results are returned by offset frequencies in the following order, in comma-separated value format:
|    |             | 1. Switching reference carrier power [dBm/300 kHz]  
|    |             | 2. Offset frequency 1 [Hz]  
|    |             | 3. Offset frequency 1 – Lower Power [dB]  
|    |             | 4. Offset frequency 1 – Upper Power [dB]  
|    |             | 5. Offset frequency 1 – Lower Power [dBm]  
|    |             | 6. Offset frequency 1 – Upper Power [dBm]  
|    |             | …  
|    |             | 17. Offset frequency 4 [Hz]  
|    |             | 18. Offset frequency 4 – Lower Power [dB]  
|    |             | 19. Offset frequency 4 – Upper Power [dB]  
|    |             | 21. Offset frequency 4 – Lower Power [dBm]  
|    |             | 21. Offset frequency 4 – Upper Power [dBm]  |

| 5  | A           | The Switching measurement results are returned by offset frequencies in the following order, in comma-separated value format. For the mask judgment results, “0” indicates “Pass,” “1” indicates “Failure,” and “2” indicates “Not judged.” If no judgment is made, the judgment result is –999.0. For the judgment criterion, ABS, REL, or OFF is returned.
|    |             | 1. Offset frequency 1 [Hz]  
|    |             | 2. Offset frequency 1 – Judgment result  
|    |             | 3. Offset frequency 1 – Limit Power [dB] or [dBm]  
|    |             | 4. Offset frequency 1 – Judgment criterion  
|    |             | …  
|    |             | 13. Offset frequency 4 [Hz]  
|    |             | 14. Offset frequency 4 – Judgment result  
|    |             | 15. Offset frequency 4 – Limit Power [dB] or [dBm]  
|    |             | 16. Offset frequency 4 – Judgment criterion  |
Table 2.8-3 lists device messages for setting Output RF Spectrum parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Mode</td>
<td>:DISPlay:ORFSpectrum[:VIEW][:SELection] MODulation</td>
</tr>
<tr>
<td></td>
<td>:DISPlay:ORFSpectrum[:VIEW][:SELection]?</td>
</tr>
</tbody>
</table>
|                                    | [:SENSe]:ORFSpectrum:LIST:MODulation:LIMit[:RELative]?

| Mask Setup – Modulation – Absolute limits | [:SENSe]:ORFSpectrum:LIST:MODulation:LIMit:ABSolute | <real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real> |
|                                         | [:SENSe]:ORFSpectrum:LIST:MODulation:LIMit:ABSolute?

| Mask Setup – Modulation – Fail Logic | [:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic | ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF |
|                                      | [:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic? 

|                                         | [:SENSe]:ORFSpectrum:LIST:SWITching:LIMit[:RELative]?

| Mask Setup – Switching – Absolute limits | [:SENSe]:ORFSpectrum:LIST:SWITching:LIMit:ABSolute | <real>,<real>,<real>,<real> |
|                                         | [:SENSe]:ORFSpectrum:LIST:SWITching:LIMit:ABSolute? 

| Mask Setup – Switching – Fail Logic | [:SENSe]:ORFSpectrum:LIST:SWITching:FLOGic | ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF |
|                                    | [:SENSe]:ORFSpectrum:LIST:SWITching:FLOGic? 

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### Table 2.8-3  Device Messages for Setting Output RF Spectrum Parameters (Cont’d)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask Setup – Select Mask</td>
<td>[:SENSe]:ORFSpectrum:LIST:SELect STANDARD</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:LIST:SELect?</td>
</tr>
<tr>
<td>Mask Setup – Load Standard Setting</td>
<td>[:SENSe]:ORFSpectrum:LIST:LSSetting</td>
</tr>
<tr>
<td>Storage Mode</td>
<td>[:SENSe]:ORFSpectrum:AVERage[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:AVERage[:STATe]?</td>
</tr>
<tr>
<td>Storage Count</td>
<td>[:SENSe]:ORFSpectrum:AVERage:COUNT &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:AVERage:COUNT?</td>
</tr>
<tr>
<td>Unit</td>
<td>:DISPlay:ORFSpectrum[:VIEW]:WINDow[1]</td>
</tr>
<tr>
<td>1800kHz Offset RBW</td>
<td>[:SENSe]:ORFSpectrum:BANDwidth[:RESolution]:MODulation:OFFSet:FAR 30K</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:BANDwidth[:RESolution]:MODulation:OFFSet:FAR?</td>
</tr>
<tr>
<td>Noise Cancel</td>
<td>[:SENSe]:ORFSpectrum:NCORrection OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:NCORrection?</td>
</tr>
<tr>
<td>Reference Mode for Switching</td>
<td>[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE PEAK</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE?</td>
</tr>
</tbody>
</table>

Table 2.8-4 lists device messages for setting Output RF Spectrum markers and reading out values of the Output RF Spectrum marker positions.

### Table 2.8-4  Device Messages for Output RF Spectrum markers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker – On/Off</td>
<td>:CALCulate:ORFSpectrum:MARKer[:STATE] OFF</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:ORFSpectrum:MARKer[:STATE]?</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:ORFSpectrum:MARKer:MODulation:X?</td>
</tr>
<tr>
<td>Marker X Axis – Switching</td>
<td>:CALCulate:ORFSpectrum:MARKer:SWITching:X &lt;freq&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:ORFSpectrum:MARKer:SWITching:X?</td>
</tr>
<tr>
<td>Marker Y Axis Value – Absolute</td>
<td>:CALCulate:ORFSpectrum:MARKer:SWITching:Y?</td>
</tr>
</tbody>
</table>
2.8.1 Measure

:CONFigure:ORFSpectrum
Output RF Spectrum

Function
This command selects Output RF Spectrum.

Command
:CONFigure:ORFSpectrum

Function
No measurement is performed.

Example of Use
To select Output RF Spectrum.
CONF:ORFS

:INITiate:ORFSpectrum
Output RF Spectrum

Function
This command executes Output RF Spectrum.

Command
:INITiate:ORFSpectrum

Example of Use
To execute Output RF Spectrum.
INIT:ORFS
:FETCh:ORFSpectrum[n]?
Output RF Spectrum Query

Function
This command reads out the measurement result of Output RF Spectrum.

Query
:FETCh:ORFSpectrum[n]?

Response
Refer to Table 2.8-2.

Example of Use
To read out the measurement result of Output RF Spectrum.
READ:ORFS?

:READ:ORFSpectrum[n]?
Output RF Spectrum Query

Function
This command reads out the measurement result after the single measurement of Output RF Spectrum has been executed by the current setting value.

Query
:READ:ORFSpectrum[n]?

Response
Refer to Table 2.8-2.

Example of Use
To execute Output RF Spectrum so that the measurement result is returned.
READ:ORFS?

Related Command
This command has the same function as the following.
:MEASure:ORFSpectrum[n]?
**Chapter 2  SCPI Device Message Details**

**:MEASure:ORFSpectrum[n]?**
Output RF Spectrum Query

**Function**
This command reads out the measurement result after the single measurement of Output RF Spectrum has been executed by the current setting value.

**Query**
**:MEASure:ORFSpectrum[n]?**

**Response**
Refer to Table 2.8-2.

**Example of Use**
To execute Output RF Spectrum so that the measurement result is returned.

MEAS:ORFS?

**Related Command**
This command has the same function as the following.
**:READ:ORFSpectrum[n]?
2.8.2 Trace Mode

:DISPlay:ORFSpectrum[:VIEW][:SELect] MODulation|SWITching|NUMeric

Trace Mode

Function

This command sets the graph type on the graph window when Output RF Spectrum is selected.

Command

:DISPlay:ORFSpectrum[:VIEW][:SELect] <mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Trace Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODulation</td>
<td>Modulation</td>
</tr>
<tr>
<td>SWITching</td>
<td>Switching</td>
</tr>
<tr>
<td>NUMeric</td>
<td>Numeric (Default)</td>
</tr>
</tbody>
</table>

Example of Use

To set Trace Mode to Modulation.

DISP:ORFS MOD
Chapter 2  SCPI Device Message Details

:DISPlay:ORFSpectrum[:VIEW][:SELect]?
Trace Mode Query

Function

This command reads out the graph type on the graph window when Output RF Spectrum is selected.

Query

:DISPlay:ORFSpectrum[:VIEW][:SELect]?

Response

<mode>

Parameter

<mode>  Trace Mode
MOD     Modulation
SWIT    Switching
NUM     Numeric

Example of Use

To read out the Trace Mode setting.

DISP:ORFS?
> MOD
2.8.3 Mask Setup – Modulation – Relative limits

[:SENSe]:ORFSpectrum:LIST:MODulation:LIMIT[:RELative]
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,

Mask Setup – Modulation – Relative limits

Function

This command sets the relative reference levels for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Command

[:SENSe]:ORFSpectrum:LIST:MODulation:LIMIT[:RELative]
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>

Parameter

<rel_ampl> Relative reference level
Range -99.99 to 99.99
Resolution 0.01 dB
Unit dB
Suffix code DB

dB is used when omitted.

Example of Use

To set the relative reference level for Modulation Analysis.

ORFS:LIST:MOD:LIM
0.5,-30.00,-.00,-60.00,-60.00,-60.00,-60.00,-60.00,-60.00,-60.00,-60.00,-63.00,-65.00,-71.00
[:SENSe]:ORFSpectrum:LIST:MODulation:LIMit[:RELative]?
Mask Setup – Modulation – Relative limits Query

Function
This command reads out the relative reference levels for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Query
[:SENSe]:ORFSpectrum:LIST:MODulation:LIMit[:RELative]?

Response
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>

Parameter
<rel_ampl> Relative reference level
Range –99.99 to 99.99
Resolution 0.01 dB
Unit dB

Example of Use
To read out the setting value of the relative reference level for Modulation Analysis.
ORFS:LIST:MOD:LI?
> 0.5,-30.00,-33.00,-60.00,-60.00,-60.00,-60.00,-60.00,-60.00,
-60.00,-60.00,-63.00,-65.00,-71.00
2.8.4 Mask Setup – Modulation – Absolute limits

[:SENSe]:ORFSpectrum:LIST:MODulation:LIMIT:ABSolute <real>,<real>, <real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>

Mask Setup – Modulation – Absolute limits

Function

This command sets the absolute reference levels for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Command

[:SENSe]:ORFSpectrum:LIST:MODulation:LIMIT:ABSolute <real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>

Parameter

<real>
  Absolute reference level
  Range   –99.99 to 99.99
  Resolution  0.01 dB
  Unit        dBM
  Suffix code  DBM

  dBm is used when omitted.

Example of Use

To set the absolute reference level for Modulation Analysis.

ORFS:LIST:MOD:LIM:ABS
30.5,–60.00,–63.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–90.00,–93.00,–95.00,–101.00
[:SENSe]:ORFSpectrum:LIST:MODulation:LIMit:ABSolute?

Mask Setup – Modulation – Absolute limits Query

Function

This command reads out the absolute reference levels for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Query

[:SENSe]:ORFSpectrum:LIST:MODulation:LIMit:ABSolute?

Response

<real>,<real>,<real>,<real>,<real>,<real>,<real>, <real>,<real>,<real>,<real>,<real>,
<real>,<real>,<real>,<real>,<real>,<real>

Parameter

<real> Absolute reference level
Range –99.99 to 99.99
Resolution 0.01 dB
Unit dBm

Example of Use

To read out the setting value of the absolute reference level for Modulation Analysis.

ORFS:LIST:MOD:LIM:ABS?
> 30.5,-60.00,-63.00,-90.00,-90.00,-90.00,-90.00,-90.00,
-90.00,-90.00,-93.00,-95.00,-101.00
2.8.5 Mask Setup – Modulation – Fail Logic

[:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF

Mask Setup – Modulation – Fail Logic

Function
This command sets the criterion for pass/fail judgment for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Command
[:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic
<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,
<mode>,<mode>,<mode>,<mode>,<mode>

Parameter
<real>  Criterion for judgment
ABSolute  Absolute
RELative  Relative
OR  Relative or Absolute
OFF  Off

Example of Use
To set the judgment criterion for Modulation Analysis.
ORFS:LIST:MOD:FLOG
REL,OR,OR,OR,OR,OR,OR,OR,ABS,OFF
[:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic?

Mask Setup – Modulation – Fail Logic Query

Function

This command sets the judgment criterion for Modulation Analysis to the offset frequency in order (starting from 100 kHz).

Query

[:SENSe]:ORFSpectrum:LIST:MODulation:FLOGic?

Response

<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,
<mode>,<mode>,<mode>,<mode>,<mode>

Parameter

<real> Criterion for judgment
ABS Absolute
REL Relative
OR Relative or Absolute
OFF Off

Example of Use

To read out the setting value of the judgment criterion for Modulation Analysis.

ORFS:LIST:MOD:FLOG?
> REL,OR,OR,OR,OR,OR,OR,OR,ABS,OFF
2.8.6 Mask Setup – Switching – Relative limits

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit[:RELative] <rel_ampl>, <rel_ampl>, <rel_ampl>, <rel_ampl>

Mask Setup – Switching – Relative limits

Function

This command sets the relative reference levels for Switching measurement to the offset frequency in order (starting from 100 kHz).

Command

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit[:RELative] <rel_ampl>, <rel_ampl>, <rel_ampl>, <rel_ampl>

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_ampl&gt;</th>
<th>Relative reference level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–99.99 to 99.99</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Unit</td>
<td>dB</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DB</td>
</tr>
</tbody>
</table>

dB is used when omitted.

Example of Use

To set the relative reference level for Switching measurement.

ORFS:LIST:SWIT:LIM 0.5,–30.00,–33.00,–60.00
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[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit[:RELative]?
Mask Setup – Switching – Relative limits Query

Function

This command reads out the relative reference levels for Switching measurement to the offset frequency in order (starting from 100 kHz).

Query

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit[:RELative]?

Response

<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>

Parameter

<rel_ampl>  Relative reference level
  Range      –99.99 to 99.99
  Resolution 0.01 dB
  Unit       dB

Example of Use

To read out the setting value of the relative reference level for Switching measurement.

ORFS:LIST:SWIT:LIM?
> 0.5,-30.00,-33.00,-60.00
2.8.7  Mask Setup – Switching – Absolute limits

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit:ABSolute <real>,<real>,
<real>,<real>

Mask Setup – Switching – Absolute limits

Function

This command sets the absolute reference levels for Switching measurement to the offset frequency in order (starting from 100 kHz).

Command

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit:ABSolute <real>,<real>,<real>,<real>

Parameter

<real>  Absolute reference level

Range  –99.99 to 99.99
Resolution  0.01 dB
Unit dBm
Suffix code DBM

dBm is used when omitted.

Example of Use

To set the absolute reference level for Switching measurement.

ORFS:LIST:SWIT:LIM:ABS 30.5,-60.00,-63.00,-90.00
[:SENSe]:ORFSpectrum:LIST:Switching:LIMit:ABSolute
Mask Setup – Switching – Absolute limits Query

Function

This command reads out the absolute reference levels for Switching measurement to the offset frequency in order (starting from 100 kHz).

Query

[:SENSe]:ORFSpectrum:LIST:SWITching:LIMit:ABSolute?

Response

<real>,<real>,<real>,<real>

Parameter

<real>
Absolute reference level

Range –99.99 to 99.99

Resolution 0.01 dB

Unit dBm

Example of Use

To read out the setting value of the absolute reference level for Switching measurement.

ORFS:LIST:SWIT:LIM:ABS?
> 30.5,-60.00,-63.00,-90.00
2.8.8 Mask Setup – Switching – Fail Logic

[:SENSe]:ORFSpectrum:LST:SWITching:FLOGic
ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF,ABSolute|RELative|OR|OFF

Mask Setup – Switching – Fail Logic

Function

This command sets the criterion for pass/fail judgment for Switching measurement to the offset frequency in order (starting from 100 kHz).

Command

[:SENSe]:ORFSpectrum:LST:SWITching:FLOGic
<mode>,<mode>,<mode>,<mode>

Parameter

<mode>  Criterion for judgment
 ABSolute  Absolute
 RELative  Relative (Default)
 OR  Relative or Absolute
 OFF  Off

Example of Use

To set the judgment criterion for Switching measurement.

ORFS:LST:SWIT:FLOG REL,OR,OR,OR
[:SENSe]:ORFSpectrum:LIST:Switching:FLOGic?

Mask Setup – Switching – Fail Logic Query

**Function**

This command sets the judgment criterion for Switching measurement to the offset frequency in order (starting from 100 kHz).

**Query**

[:SENSe]:ORFSpectrum:LIST:SWITching:FLOGic?

**Response**

<mode>,<mode>,<mode>,<mode>

**Parameter**

<mode>  
ABS Absolute  
REL Relative  
OR Relative or Absolute  
OFF Off

**Example of Use**

To read out the setting value of the judgment criterion for Switching measurement.

ORFS:LIST:SWIT:FLOG?

> REL,OR,OR,OR
2.8.9  Select Standard

[:SENSe]:ORFSpectrum:LIST:SELect STANdard|USER

Mask Setup – Select Standard

Function

This command sets the mask type applied to the judgment.

Command

[:SENSe]:ORFSpectrum:LIST:SELect <mode>

Parameter

<mode>  
   STANdard  Standard (Default)
   USER    User

Example of Use

To set the mask type to Standard.

ORFS:LIST:SELe STAN

[:SENSe]:ORFSpectrum:LIST:SELect?

Mask Setup – Select Standard Query

Function

This command reads out the setting value applied to the judgment.

Query

[:SENSe]:ORFSpectrum:LIST:SELect?

Response

<mode>

Parameter

<mode>  
   STAN  Standard
   USER  User

Example of Use

To read out the setting of the mask type.

ORFS:LIST:SELe
> STAN
2.8.10 Load Standard Setting
[:SENSe]:ORFSpectrum:LIST:LSSetting

Mask Setup – Load Standard Setting

Function

This command loads the standard setting value into the user-established mask.

Command

[:SENSe]:ORFSpectrum:LIST:LSSetting

Example of Use

To load the standard setting value into the user-established mask.

ORFS:LIST:LSS
2.8.11 Storage Mode

[:SENSe]:ORFSpectrum:AVERage[:STATe] OFF|ON|0|1

Storage Mode

Function

This command sets the storage mode.

Command

[:SENSe]:ORFSpectrum:AVERage[:STATe] <mode>

Parameter

<mode>  Storage Mode
OFF|0  Off (Default)
ON|1  On

Example of Use

To set the storage mode to On.

ORFS:AVER ON

[:SENSe]:ORFSpectrum:AVERage[:STATe]?

Storage Mode Query

Function

This command reads out the storage mode setting.

Query

[:SENSe]:ORFSpectrum:AVERage[:STATe]?

Response

<mode>

Parameter

<mode>  Storage Mode
0  Off
1  On

Example of Use

To read out the storage mode setting.

ORFS:AVER?
> 1
2.8.12 Storage Count

[:SENSe]:ORFSpectrum:AVERage:COUNt <integer>

Storage Count

Function
This command sets the Storage Count.

Command
[:SENSe]:ORFSpectrum:AVERage:COUNt <integer>

Parameter
<integer> Storage Count
Range 2 to 9999
Resolution 1
Default 10

Example of Use
To set the storage count to 10.
ORFS:AVER:COUN 10

[:SENSe]:ORFSpectrum:AVERage:COUNt?

Storage Count Query

Function
This command reads out the setting of the Storage Count.

Query
[:SENSe]:ORFSpectrum:AVERage:COUNt?

Response
<integer>

Parameter
<integer> Storage Count
Range 2 to 9999
Resolution 1

Example of Use
To read out the storage count setting.
ORFS:AVER:COUN?
> 10
### 2.8.13 Unit

:DISPlay:ORFSpectrum[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:UNIT DB|DBM

**Unit**

**Function**

This command sets the Y-axis unit on the graph when Output RF Spectrum is selected.

**Command**


**Parameter**

- <mode> Unit
  - DB dB (Default)
  - DBM dBm

**Example of Use**

To set the unit to dB.

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Unit Query

Function

This command reads out the Y-axis unit on the graph when Output RF Spectrum is selected.

Query


Response

<mmode>

Parameter

<mmode>  Unit
  DB     dB
  DBM    dBm

Example of Use

To read out the setting of the unit.

DISP:ORFS:WIND:TRAC:Y:UNIT?
> DB
2.8.14 Marker – On/Off

:CALCulate:ORFSpectrum:MARKer[:STATe] OFF|ON|0|1

Marker – On/Off

Function

This command sets Marker On/Off when Output RF Spectrum is selected.

Command

:CALCulate:ORFSpectrum:MARKer[:STATe] <switch>

Parameter

<switch>       Marker
   0 | OFF     Off (Default)
   1 | ON      On

Example of Use

To display the marker.

CALC:ORFS:MARK 1

:CALCulate:ORFSpectrum:MARKer[:STATe]?

Marker – On/Off Query

Function

This command reads out the setting of Marker On/Off when Output RF Spectrum is selected.

Query

:CALCulate:ORFSpectrum:MARKer[:STATe]?

Response

<switch>

Parameter

<switch>       Marker
   0         Off
   1         On

Example of Use

To read out the marker setting.

CALC:ORFS:MARK?
> 1
2.8.15 Marker Position – Modulation

:CALCulate:ORFSpectrum:MARKer:MODulation:X <freq>

Marker X Axis Position

Function

This command sets the marker position on the Modulation graph.

Command

:CALCulate:ORFSpectrum:MARKer:MODulation:X <freq>

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;freq&gt;</td>
<td>Marker position (Range: –6000, –3000, –1800, –1600, –1400, –1200, –1000, –800, –600, –400, –250, –200, –100, 0, 100, 200, 250, 400, 600, 800, 1000, 1200, 1400, 1600, 1800, 3000, 6000) Unit: kHz)</td>
</tr>
<tr>
<td>Suffix code</td>
<td>HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ</td>
</tr>
</tbody>
</table>

He is used when omitted.

Default 0 kHz

Example of Use

To set the marker position on the graph to 400 kHz.

CALC:ORFS:MARK:MOD:X 400KHZ
:CALCulate:ORFSpectrum:MARKer:MODulation:X?

Marker X Axis Position Query

**Function**

This command reads out the marker position on the Modulation graph.

**Query**

:CALCulate:ORFSpectrum:MARKer:MODulation:X?

**Response**

<freq>

**Parameter**

<freq>  
Marker position

Range

-6000, -3000, -1800, -1600, -1400,  
-1200, -1000, -800, -600, -400, -250,  
-200, -100, 0,  
100, 200, 250, 400, 600, 800, 1000, 1200,  
1400, 1600, 1800, 3000, 6000 (Unit: kHz)

Resolution 1 Hz

Value is returned in Hz units.

**Example of Use**

To read out the setting of the marker position on the graph.

CALC:ORFS:MARK:MOD:X?  
> 400000
2.8.16 Marker Position – Switching

:CALCulate:ORFSpectrum:MARKer:SWITching:X <freq>

Marker X Axis Position

Function

This command sets the marker position on the Switching graph.

Command

:CALCulate:ORFSpectrum:MARKer:SWITching:X <freq>

Parameter

- `<freq>`  
  Marker position
  
  **Range**  
  –1800, –1200, –600, –400, 0, 400, 600, 1200, 1800 (Unit: kHz)

  **Suffix code**  
  HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ

  Hz is used when omitted.

  **Default**  
  0 kHz

Example of Use

To set the marker position on the graph to 400 kHz.

CALC:ORFS:MARK:SWIT:X 400KHZ
:CALCulate:ORFSpectrum:MARKer:SWITching:X?
Marker X Axis Position Query

Function
This command reads out the marker position on the Switching graph.

Query
:CALCulate:ORFSpectrum:MARKer:SWITching:X?

Response
<freq>

Parameter
<freq> Marker position
Range –1800, –1200, –600, –400, 0, 400, 600, 1200, 1800 (Unit: kHz)
Resolution 1 Hz
Value is returned in Hz units.

Example of Use
To read out the setting of the marker position on the graph.
CALC:ORFS:MARK:SWIT:X?
> 400000
2.8.17 Marker Value

:CALCulate:ORFSpectrum:MARKer:MODulation:Y?

Modulation – Marker Y Axis Value – Query

Function

This command reads out the Y-axis value on the Modulation graph marker.

Query

:CALCulate:ORFSpectrum:MARKer:MODulation:Y?

Response

<real>

Parameter

<real> ≤ Y-axis at the modulation marker position

Resolution 0.01 dB

Value is returned in the current Y-axis setting units.

Example of Use

To read out the Y-axis at the marker position.

CALC:ORFS:MARK:MOD:Y?

> -50.12
Function

This command reads out the Y-axis value on the Switching graph marker.

Query

:CALCulate:ORFSpectrum:MARKer:SWITching:Y?

Response

<real>

Parameter

<real> Y-axis at the Switching marker position

Resolution 0.01 dB

Value is returned in the current Y-axis setting units.

Example of Use

To read out the Y-axis at the marker.

CALC:ORFS:MARK:SWIT:Y?

> -50.12
2.8.18 1800kHz Offset RBW (for Modulation Meas BW)

[:SENSe]:ORFSpectrum:BANDwidth[:RESo lution]:MODulation:OFFSet:FAR

Function

This command sets the RBW of Offset frequency 1800 kHz to be used for Spectrum due to modulation measurement.

Command

[:SENSe]:ORFSpectrum:BANDwidth[:RESo lution]:MODulation:OFFSet:FAR <rbw>

Parameter

<rbw> | RBW
---|---
30K | 30 kHz
100K | 100 kHz (Default)

Example of Use

To set 1800 kHz Offset RBW to 30 kHz.

ORFS:BAND:MOD:OFFS:FAR 30K

[:SENSe]:ORFSpectrum:BANDwidth[:RESo lution]:MODulation:OFFSet:FAR?

Function

This command queries the RBW of Offset frequency 1800 kHz to be used for Spectrum due to modulation measurement.

Query

[:SENSe]:ORFSpectrum:BANDwidth[:RESo lution]:MODulation:OFFSet:FAR?

Response

<rbw>

Parameter

<rbw> | RBW
---|---
30K | 30 kHz
100K | 100 kHz

Example of Use

To query 1800kHz Offset RBW.

ORFS:BAND:MOD:OFFS:FAR?

> 100K
2.8.19 Noise Cancel
[:SENSe]:ORFSpectrum:NCORrection OFF|ON|0|1

Noise Cancel

Function
This command sets On/Off for Noise Cancel when selecting Output RF Spectrum.

Command
[:SENSe]:ORFSpectrum:NCORrection <mode>

Parameter
<mode> Noise Cancel
OFF|0 Off (Default)
ON|1 On

Example of Use
To set Noise Cancel to On when selecting Output RF Spectrum.
ORFS:NCOR ON

[:SENSe]:ORFSpectrum:NCORrection?
Noise Cancel – Query

Function
This command reads out the Noise Cancel settings when selecting Output RF Spectrum.

Query
[:SENSe]:ORFSpectrum:NCORrection?

Response
<mode>

Parameter
<mode> Noise Cancel
0 Off
1 On

Example of Use
To read out the Noise Cancel setting when selecting Output RF Spectrum.
ORFS:NCOR?
> 1
2.8.20 Reference Mode for Switching

[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE PEAK|RMS

Reference Mode for Switching

Function

This command sets Reference Power for the switching measurement when selecting Output RF Spectrum.

Command

[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE <mode>

Parameter

<mode> Reference Mode
    PEAK peak
    RMS rms (Default)

Example of Use

To set the Peak value as the Reference Power at the Switching measurement when selecting Output RF Spectrum.

ORFS:SWIT:REF:MODE PEAK

[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE?

Reference Mode for Switching – Query

Function

This command reads out the Reference Power settings for the Switching measurement when selecting Output RF Spectrum.

Query

[:SENSe]:ORFSpectrum:SWITching:REFerence:MODE?

Response

<mode>

Parameter

<mode> Reference Mode
    PEAK peak
    RMS rms

Example of Use

To read out Reference Power for the Switching measurement when selecting Output RF Spectrum.

ORFS:SWIT:REF:MODE?
> PEAK
## 2.9 Power vs Time

Table 2.9-1 lists device messages for Power vs Time.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configure</td>
<td>:CONFigure:PVTime</td>
</tr>
<tr>
<td>Initiate</td>
<td>:INITiate:PVTime</td>
</tr>
<tr>
<td>Fetch</td>
<td>:FETCH:PVTime[n]?</td>
</tr>
<tr>
<td>Read</td>
<td>:READ:PVTime[n]?</td>
</tr>
<tr>
<td>Measure</td>
<td>:MEASure:PVTime[n]?</td>
</tr>
</tbody>
</table>
Table 2.9-2 lists responses to the parameter n on Table 2.9-1. –999.0 is returned when Result Mode is set to B.

<table>
<thead>
<tr>
<th>n</th>
<th>Result Mode</th>
<th>Response</th>
</tr>
</thead>
</table>
| 1 or omitted | A           | Responses are returned with comma separated value format in the following order. 0 indicates “Pass”, 1 indicates “Failure”, and 2 indicates “Not judged”.  
1. Judgment result for the masks (in all the slots)  
2. Slot #0 State (0 = Active, 1 = Inactive)  
3. Slot #0 Average Power [dBm]  
4. Slot #0 Maximum Power [dBm]  
5. Slot #0 Minimum Power [dBm]  
6. Slot #0 Judgment result for mask  
...  
37. Slot #7 State (0 = Active, 1 = Inactive)  
38. Slot #7 Average Power [dBm]  
39. Slot #7 Maximum Power [dBm]  
40. Slot #7 Minimum Power [dBm]  
41. Slot #7 Judgment result for mask  
42. Time Offset* [s] (Average value for Storage Count)  
43. Time Offset* [s] (Maximum value for Storage Count)  
*: When Trigger Switch is Off: –999.0 |
| 2        | A           | Average Power at the measurement point to the selected slot is returned with comma separated value format. The data numbers are as follows. The unit of the return value depends on the value set by Unit.  
When RF Signal is Normal Burst or Continuous: 3661  
When RF Signal is Higher Symbol Rate Burst: 4241 |
| 8        | A           | Maximum Power at the measurement point is returned with comma separated value format. The data numbers are as follows. The unit of the return value depends on the value set by Unit.  
When RF Signal is Normal Burst or Continuous: 3661  
When RF Signal is Higher Symbol Rate Burst: 4241 |
| 9        | A           | Minimum Power at the measurement point is returned with comma separated value format. The unit of the return value depends on the value set by Unit.  
When RF Signal is Normal Burst or Continuous: 3661  
When RF Signal is Higher Symbol Rate Burst: 4241 |
Table 2.9-3 list device messages for setting Power vs Time parameters.

### Table 2.9-3  Device Messages for Setting Power vs Time Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace Mode</td>
<td>DISPLAY:PVTime[:VIEW][:SELECT] RAFall</td>
</tr>
<tr>
<td></td>
<td>DISPLAY:PVTime[:VIEW][:SELECT]?</td>
</tr>
<tr>
<td>Unit</td>
<td>DISPLAY:PVTime[:VIEW]:WINDow[1]</td>
</tr>
<tr>
<td></td>
<td>DISPLAY:PVTime[:VIEW]:WINDow[1]</td>
</tr>
<tr>
<td>Slot</td>
<td>DISPLAY:PVTime[:VIEW]:WINDow[1]</td>
</tr>
<tr>
<td></td>
<td>DISPLAY:PVTime[:VIEW]:WINDow[1]</td>
</tr>
<tr>
<td>Mask Setup – Select Mask</td>
<td>[:SENSe]:PVTime:MASK:SELECT STANdard</td>
</tr>
<tr>
<td>Mask Setup – Load Standard Setting</td>
<td>[:SENSe]:PVTime:MASK:LSSetting</td>
</tr>
<tr>
<td>Mask Setup – Upper limits – Rise – Time</td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:TIME &lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:TIME?</td>
</tr>
<tr>
<td>Mask Setup – Upper – Rise – Absolute limits</td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:Absolute &lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:Absolute?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:RELative?</td>
</tr>
<tr>
<td>Mask Setup – Upper – Rise – Fail Logic</td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic ABSolute</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic?</td>
</tr>
<tr>
<td>Filter Type</td>
<td>[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE GAUSsian</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE?</td>
</tr>
<tr>
<td>Filter BW</td>
<td>[:SENSe]:PVTime:BANDwidth[:RESolution] 300Khz</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:BANDwidth[:RESolution]?</td>
</tr>
</tbody>
</table>
### Table 2.9-3  Device messages for setting Power vs Time parameters (Cont’d)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask Setup – Upper limits – Fall – Time</td>
<td>[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME &lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt; [:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME?</td>
</tr>
</tbody>
</table>
### Table 2.9-3  Device messages for Setting Power vs Time parameters (Cont’d)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mask Setup – Lower limits – Fall – Time</td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME &lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;,&lt;time&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME?</td>
</tr>
<tr>
<td>Mask Setup – Lower – Fall – Absolute limits</td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:ABSolute &lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;,&lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:ABSolute?</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:RELative?</td>
</tr>
<tr>
<td>Mask Setup – Lower – Fall – Fail Logic</td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic ABSolute</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic?</td>
</tr>
<tr>
<td>Storage Mode</td>
<td>[:SENSe]:PVTime:AVERage[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:AVERage[:STATe]?</td>
</tr>
<tr>
<td>Storage Count</td>
<td>[:SENSe]:PVTime:AVERage:COUNt &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:AVERage:COUNt?</td>
</tr>
<tr>
<td>Average Type</td>
<td>[:SENSe]:PVTime:AVERage:TYPE POWER</td>
</tr>
<tr>
<td></td>
<td>[:SENSe]:PVTime:AVERage:TYPE?</td>
</tr>
</tbody>
</table>

Table 2.9-4 lists device messages for setting Power vs Time markers and reading out the marker position values

### Table 2.9-4  Device messages for Power vs Time markers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker – On/Off</td>
<td>:CALCulate:PVTime:MARKer[:STATe] OFF</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVTime:MARKer[:STATe]?</td>
</tr>
<tr>
<td>Marker – Active Trace</td>
<td>:CALCulate:PVTime:MARKer:ACTive RISE</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVTime:MARKer:ACTive?</td>
</tr>
<tr>
<td>Marker X Axis</td>
<td>:CALCulate:PVTime:MARKer:X[:POINT] &lt;real&gt;</td>
</tr>
<tr>
<td></td>
<td>:CALCulate:PVTime:MARKer:X[:POINT]?</td>
</tr>
<tr>
<td>Marker Y Axis Value – Average</td>
<td>:CALCulate:PVTime:MARKer:Y[:AVERage]?</td>
</tr>
<tr>
<td>Marker Y Axis Value – Maximum</td>
<td>:CALCulate:PVTime:MARKer:Y:MAXimum?</td>
</tr>
</tbody>
</table>
2.9.1 Measure

:CONFigure:PVTime

Power vs Time

Function

This command selects Power vs Time.

Command

:CONFigure:PVTime

Example of Use

To select Power vs Time.

CONF:PVT

:INITiate:PVTime

Power vs Time

Function

This command executes Power vs Time.

Command

:INITiate:PVTime

Example of Use

To execute Power vs Time.

INIT:PVT
2.9 Power vs Time

:FETCh:PVTime [n]?

Power vs Time Query

Function

This command reads out the measurement result of Power vs Time.

Query

:FETCh:PVTime [n]?

Response

Refer to Table 2.9-2.

Example of Use

To read out the measurement result of Power vs Time.

FETC:PVT?

:READ:PVTime [n]?

Power vs Time Query

Function

This command reads out the measurement result after the single measurement for Power vs Time has been executed by the current setting value.

Query

:READ:PVTime [n]?

Response

Refer to Table 2.9-2.

Example of Use

To execute Power vs Time so that the measurement result is read out.

READ:PVT?

Related Command

This command has the same function as the following.

:MEASure:PVTime [n]?
Chapter 2  SCPI Device Message Details

:MEASure:PVTime [n]?
Power vs Time Query

Function
This command reads out the measurement result after the single measurement for Power vs Time has been executed by the current setting value.

Query
:MEASure:PVTime[n]?

Response
Refer to Table 2.9-2.

Example of Use
To execute Power vs Time so that the measurement result is read out.
MEAS:PVT?

Related Command
This command has the same function as the following.
:READ:PVTime[n]?
2.9.2 Trace Mode

:DISPlay:PVTime[:VIEW][:SELect] RAFall|SLOT|FRAME

Trace Mode

Function

This command sets the graph type on the graph window when Power vs Time is selected.

Command

:DISPlay:PVTime[:VIEW][:SELect] <mode>

Parameter

<mode> | Trace Mode
------ |----------
RAFall | Rise and Fall
SLOT  | Slot (Default)
FRAME | Frame

Example of Use

To set Trace Mode to Rise and Fall.

DISP:PVT RAF

:DISPlay:PVTime[:VIEW][:SELect]?

Trace Mode Query

Function

This command reads out the graph type on the graph window when Power vs Time is selected.

Query

:DISPlay:PVTime[:VIEW][:SELect]?

Response

<mode>

Parameter

<mode> | Trace Mode
------ |----------
RAF   | Rise and Fall
SLOT  | Slot
FRAME | Frame

Example of Use

To read out the Trace Mode setting.

DISP:PVT?
> FRAM
2.9.3  Unit

:DISPlay:PVTime[:VIEW]:WINDow[1]|2|3:TRACe:Y[:SCALe]:UNIT DB|DBM

Function

This command sets the Y-axis unit on the graph when Power vs Time is selected.

Command


Parameter

<mode>                  Unit
  DB                    dB (Default)
  DBM                   dBm

Example of Use

To set the unit to dB.

DISP:PVT:WIND:TRAC:Y:UNIT DB
:DISPlay:PVTme[:VIEW]:WINDo[w[1]|2|3]:TRACe:Y[:SCALe]:UNIT?

Unit Query

Function

This command reads out the Y-axis unit setting on the graph when Power vs Time is selected.

Query

:DISPlay:PVTme[:VIEW]:WINDo[w[1]|2|3]:TRACe:Y[:SCALe]:UNIT?

Response

<mode>

Parameter

<mode>    Unit
          DB    dB
          DBM   dBm

Example of Use

To read out the unit setting.

DISP:PVT:WIND:TRAC:Y:UNIT?
> DB
2.9.4 Display Item


Display Item

**Function**

This command sets the measurement result type on the Power vs Time graph.

**Command**


**Parameter**

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Display Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVERage</td>
<td>Average</td>
</tr>
<tr>
<td>ALL</td>
<td>All (Default)</td>
</tr>
</tbody>
</table>

**Example of Use**

To set the display item to All.

DISP:PVT:WIND:TRAC:Y:DIT ALL


Display Item Query

**Function**

This command reads out the setting of the measurement result type on the Power vs Time graph.

**Query**


**Response**

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVER</td>
<td>Average</td>
</tr>
<tr>
<td>ALL</td>
<td>All</td>
</tr>
</tbody>
</table>

**Example of Use**

To read out the setting of the display item.

DISP:PVT:WIND:TRAC:Y:DIT?

> ALL
2.9.5 Slot


Slot

Function

This command sets the slot number on the Power vs Time graph.

Command


Parameter

<integer> Slot

Range 0 to 7
Resolution 1
Default 0

Example of Use

To set Slot to 1.

DISP:PVT:WIND:TRAC:X:SLOT 1
Chapter 2  SCPI Device Message Details

Slot Query

Function

This command reads out the setting of the slot number on the Power vs Time graph.

Query


Response

<integer>

Parameter

<integer>  Slot
Range  0 to 7
Resolution  1

Example of Use

To read out the Slot setting.

DISP:PVT:WIND:TRAC:X:SLOT?
> 1
2.9.6 Select Standard

[:SENSe]:PVTime:MASK:SELect STANdard|USER

Mask Setup – Select Mask

Function

This command sets the mask type applied to the judgment.

Command

[:SENSe]:PVTime:MASK:SELect <mode>

Parameter

<mode> Mask type  
STANdard Standard (Default)  
USER User

Example of Use

To set the mask type to Standard.

PVT:MASK:SEL STAN

[:SENSe]:PVTime:MASK:SELect?

Mask Setup – Select Mask Query

Function

This command reads out the setting applied to the judgment.

Query

[:SENSe]:PVTime:MASK:SELect?

Response

<mode>

Parameter

<mode> Mask type  
STAN Standard  
USER User

Example of Use

To read out the mask type setting.

PVT:MASK:SEL?  
> STAN
2.9.7 Load Standard Setting

[:SENSe]:PVTime:MASK:LSSetting

Mask Setup – Load Standard Setting

Function

This command reads the standard setting value into the user-established mask.

Command

[:SENSe]:PVTime:MASK:LSSetting

Example of Use

To read the standard setting value into the user-established mask.

FVT:MASK:LSS
2.9.8 Upper – Rise – Time

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:TIME
<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,
<time>,<time>

Mask Setup – Upper limits – Rise – Time

Function

This command sets the time point for the upper limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:TIME
<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,
<time>,<time>,<time>

Parameter

<time>  Time point
  Range  -48.00 to 48.00
  Resolution  0.01
  Suffix code  NS,US,MS,S
  s is used when omitted.

Details

The first, eighth, and ninth arguments are fixed. Values set for them are ignored.

Example of Use

To set the time point of the user-established mask.

PVT:MASK:LIST:UPP:RISE:TIME
-48US,-28US,-28US,-18US,-18US,-10US,-10US,0,0,0,0

s is used when omitted.
The command reads out the setting value of the time point for the upper limit line of the power rising part on the user-established mask.

**Parameter**

- **<time>**
  - Time point
  - Range: -40.00 to 48.00
  - Resolution: 0.01
  - Suffix code: None
  - Value is returned in s units.

**Example of Use**

To read out the time point of the user-established mask.

```plaintext
PVT:MASK:LIST:UPP:RISE:TIME?
> -0.00004800,-0.00002800,-0.00002800,-0.00001800,
  -0.00001800,-0.0000100,-0.0000100,0.00000000,
  0.00000000,0.00000000,0.00000000
```
2.9.9 Upper – Rise – Absolute limits

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,
<real>

Mask Setup – Upper – Rise – Absolute limits

Function

This command sets the absolute reference level for the upper limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,
<real>,<real>,<real>

Parameter

<real> Absolute reference level

<table>
<thead>
<tr>
<th>Range</th>
<th>–99.99 to 99.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Unit</td>
<td>dBm</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DBM</td>
</tr>
</tbody>
</table>

dBm is used when omitted.

Example of Use

To set the absolute reference level of the user-established mask.

PVT:MASK:LIST:UPP:RISE:ABS
[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:ABSolute?
Mask Setup – Upper – Rise – Absolute limits Query

Function
This command reads out the setting value of the absolute reference level for the upper limit line of the power-rising part on the user-established mask.

Query
[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:ABSolute?

Parameter
<real> Absolute reference level
Range -99.99 to 99.99
Resolution 0.01 dB
Unit dBm

Example of Use
To read out the setting value of the absolute reference level of the user-established mask.

PVT:MASK:LIST:UPP:RISE:ABS?
99.99,99.99
2.9.10 Upper – Rise – Relative limits

[:SENSe]:PVTime:MASK:LIST:UPP:RISE:RELative

<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Mask Setup – Upper – Rise – Relative limits

Function

This command sets the relative reference level for the upper limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPP:RISE:RELative <rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Parameter

<table>
<thead>
<tr>
<th>&lt;rel_amp&gt;</th>
<th>Relative reference level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–99.99 to 99.99</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Unit</td>
<td>dB</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DB</td>
</tr>
<tr>
<td></td>
<td>dB is used when omitted.</td>
</tr>
</tbody>
</table>

Example of Use

To set the relative reference level of the user-established mask.

PVT:MASK:LIST:UPP:RISE:REL
-30.00,-30.00,-30.00,-30.00,-6.00,-6.00,4.00,4.00,1.00,
1.00,1.00
[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:RELative?

Mask Setup – Upper – Rise – Relative limits Query

Function

This command reads out the setting value of the relative reference level for the upper limit line of the power rising part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:RELative?

Parameter

<real> Absolute reference level
  Range –99.99 to 99.99
  Resolution 0.01 dB
  Unit dB

Example of Use

To read out the setting value of the relative reference level of the user-established mask.

PVT:MASK:LIST:UPP:RISE:REL?
> -30.00,-30.00,-30.00,-30.00,-6.00,-6.00,4.00,4.00,1.00,1.00,1.00
2.9.11 Upper – Rise – Fail Logic

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic

ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF

Mask Setup – Upper – Rise – Fail Logic

Function

This command sets the criterion for Pass/Fail judgment for the upper limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic <mode>,
<mode>,<mode>,<mode>,<mode>,<mode>,<mode>,
<mode>,<mode>,<mode>

Parameter

<real> Criterion for judgment
ABSolute Absolute
RELative Relative
OR Relative or Absolute
OFF Off

Example of Use

To set the judgment criterion for the user-established mask.

PVT:MASK:LIST:UPP:RISE:FLOG
REL,REL,REL,REL,REL,REL,REL,REL,REL,REL
[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic?
Mask Setup – Upper – Rise – Fail Logic Query

Function

This command reads out the setting value of the criterion for Pass/Fail judgment for the upper limit line of the power-rising part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:RISE:FLOGic?

Parameter

<real>  Criterion for judgment
ABS    Absolute
REL    Relative
OR    Relative or Absolute
OFF    Off

Example of Use

To read the setting value of the judgment criterion for the user-established mask.

PVT:MASK:LIST:UPP:RISE:FLOG?
> REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL
2.9.12 Upper – Fall – Time

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME
<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>
Mask Setup – Upper limits – Fall – Time

Function

This command sets the time point for the upper limit line of the power-falling part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME
<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>

Parameter

<time> Time point
Range –48.00 to 48.00
Resolution 0.01 µs
Suffix code NS,US,MS,S
s is used when omitted.

Details

The third, fourth, and eleventh arguments are fixed. Values set for them are ignored.

Example of Use

To set the time point of the user-established mask.

0,0,0,10US,10US,18US,18US,28US,28US,48US
Chapter 2  SCPI Device Message Details

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME?
Mask Setup – Upper limits – Fall – Time Query

Function

This command reads out the setting value of the time point for the upper limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:TIME?

Parameter

<table>
<thead>
<tr>
<th>&lt;time&gt;</th>
<th>Time point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>–48.00 to 48.00</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 µs</td>
</tr>
<tr>
<td>Suffix code</td>
<td>None</td>
</tr>
</tbody>
</table>

Value is returned in s units.

Example of Use

To read out the time point of the user-established mask.

PVT:MASK:LIST:UPP:FALL:TIME?
> 0.00000000,0.00000000,0.00000000,0.00000000,0.00001000,0.00001000,0.00001800,0.00001800,0.00002800,0.00002800,0.00004800
2.9.13 Upper – Fall – Absolute limits

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>

Mask Setup – Upper – Fall – Absolute limits

Function

This command sets the absolute reference level for the upper limit line of the power-falling part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>,<real>

Parameter

<real>  Absolute reference level
Range    –99.99 to 99.99
Resolution 0.01 dB
Unit dBm
Suffix code DBM

dBm is used when omitted.

Example of Use

To set the absolute reference level of the user-established mask.

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:ABSolute?
Mask Setup – Upper – Fall – Absolute limits Query

Function

This command reads out the setting value of the absolute reference level for the upper limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:ABSolute?

Parameter

<real> Absolute reference level
Range –99.99 to 99.99
Resolution 0.01 dB
Unit dBm

Example of Use

To read out the setting value of the absolute reference level.

PVT:MASK:LIST:UPP:FALL:ABS?
2.9.14 Upper – Fall – Relative limits

[:SENSe]:PVT:MASK:LIST:UPPer:FALL:RELative

<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Mask Setup – Upper – Fall – Relative limits

Function

This command sets the relative reference level for the upper limit line of
the power-falling part on the user-established mask.

Command

[:SENSe]:PVT:MASK:LIST:UPPer:FALL:RELative <rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Parameter

<rel_amp> Relative reference level
  Range –99.99 to 99.99
  Resolution 0.01 dB
  Unit dB
  Suffix code DB
  dB is used when omitted.

Example of Use

To set the relative reference level of the user setting mask.

1.00,1.00,1.00,1.00,1.00,-6.00,-6.00,-30.00,-30.00,
-30.00,-30.00
[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:RELative?
Mask Setup – Upper – Fall – Relative limits Query

Function

This command reads out the setting value of the relative reference level for the upper limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:RELative?

Parameter

<real> Absolute reference level
Range –99.99 to 99.99
Resolution 0.01 dB
Unit dB

Example of Use

To read out the setting value of the relative reference level of the user setting mask.

PVT:MASK:LIST:UPP:FALL:REL?
> 1.00,1.00,1.00,1.00,1.00,–6.00,–6.00,–30.00,–30.00,–30.00,–30.00,–30.00
2.9.15 Upper – Fall – Fail Logic

[SENSe]:PVTime:MASK:LIST:UPPer:FALL:FLOGic

ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,

Mask Setup – Upper – Fall – Fail Logic

Function

This command sets the criterion for Pass/Fail judgment for the upper limit line of the power-falling part on the user-established mask.

Command

[SENSe]:PVTime:MASK:LIST:UPPer:FALL:FLOGic <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>, <mode>

Parameter

<mode> Criterion for judgment
ABSolute Absolute
RELative Relative
OR Relative or Absolute
OFF Off

Example of Use

To set the judgment criterion for the user-established mask.

PVT:MASK:LIST:UPP:FALL:FLOG
REL,REL,REL,REL,REL,REL,REL,REL,REL
[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:FLOGic?
Mask Setup – Upper – Fall – Fail Logic Query

Function

This command reads out the setting value of the criterion for Pass/Fail judgment for the upper limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:UPPer:FALL:FLOGic?

Parameter

<mode> Criterion for judgment
  ABS Absolute
  REL Relative
  OR Relative or Absolute
  OFF Off

Example of Use

To read out the setting value of the judgment criterion for the user-established mask.

PVTime:MASK:LIST:UPPer:FALL:FLOG?
> REL,REL,REL,REL,REL,REL,REL,REL,REL,REL
2.9.16 Lower – Rise – Time

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:TIME

<time>,<time>,<time>,<time>,<time>,<time>

Mask Setup – Lower limits – Rise – Time

Function

This command sets the time point the lower limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:TIME
<time>,<time>,<time>,<time>,<time>,<time>

Parameter

<time> Time point

Range –8.00 to 8.00
Resolution 0.01 µs
Suffix code NS,US,MS,S
s is used when omitted.

Example of Use

To set the time point of the user-established mask.

PVT:MASK:LIST:LOW:RISE:TIME 0,0,2US,2US,4US,4US
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:TIME?
Mask Setup – Lower limits – Rise – Time Query

Function
This command reads out the setting value of the time point for the lower limit line of the power-rising part on the user-established mask.

Query
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:TIME?

Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;time&gt;</td>
<td>Time point</td>
</tr>
<tr>
<td>Range</td>
<td>–8.00 to 8.00</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01 µs</td>
</tr>
<tr>
<td>Suffix code</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Value is returned in s units.</td>
</tr>
</tbody>
</table>

Example of Use
To read out the time point of the user-established mask.

PVT:MASK:LIST:LOW:RISE:TIME?
> 0.00000000,0.00000000,0.00000200,0.00000200,
  0.00000400,–0.00000400
2.9.17 Lower – Rise – Absolute limits
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>

Mask Setup – Lower – Rise – Absolute limits

Function
This command sets the absolute reference level for the lower limit line of the power-rising part on the user-established mask.

Command
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:ABSolute
<real>,<real>,<real>,<real>,<real>,<real>

Parameter
<real>
Absolute reference level
Range
-99.99 to 99.99
Resolution
0.01 dB
Unit
dBm
Suffix code
DBM

dBm is used when omitted.

Example of Use
To set the absolute reference level of the user-established mask.

PV:MASK:LIST:LOW:RISE:ABS
This command reads out the setting value of the absolute reference level for the lower limit line of the power-rising part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:ABSolute?

Parameter

<real> Absolute reference level

- Resolution: 0.01 dB
- Unit: dBm

Example of Use

To read out the setting of the absolute reference level of the user-established mask.

PVT:MASK:LIST:LOW:RISE:ABS?

2.9.18 Lower – Rise – Relative limits

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:RELative

<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Mask Setup – Lower – Rise – Relative limits

Function

This command sets the relative reference level for the lower limit line of the power-rising part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:RELative <rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Parameter

<rel_amp> Relative reference level

Range –99.99 to 99.99
Resolution 0.01 dB
Unit dB
Suffix code DB

dB is used when omitted.

Example of Use

To set the relative reference level of the user-established mask.

PVT:MASK:LIST:LOW:RISE
–99.99,–99.99,–1.00,–1.00,–1.00,–1.00
Function

This command reads out the setting value of the relative reference level for the lower limit line of the power-rising part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE[:RELative]?

Parameter

<rel_amp> Relative reference level
  Range –99.99 to 99.99
  Resolution 0.01 dB
  Unit dB

Example of Use

To read out the setting value of the relative reference level of the user-established mask.

PVT:MASK:LIST:LOW:RISE
> -99.99,-99.99,-1.00,-1.00,-1.00,-1.00
2.9.19 Lower – Rise – Fail Logic

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:FLOGic
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF

Mask Setup – Lower – Rise – Fail Logic

Function
This command sets the criterion for Pass/Fail judgment for the lower
limit line of the power-rising part on the user-established mask.

Command
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:FLOGic <mode>,
<mode>,<mode>,<mode>,<mode>,<mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Criterion for judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSolute</td>
<td>Absolute</td>
</tr>
<tr>
<td>RELative</td>
<td>Relative</td>
</tr>
<tr>
<td>OR</td>
<td>Relative or Absolute</td>
</tr>
<tr>
<td>OFF</td>
<td>Off</td>
</tr>
</tbody>
</table>

Example of Use
To set the judgment criterion for the user-established mask.

PVT:MASK:LIST:LOW:RISE:FLOG OFF,OFF,REL,REL,REL,REL
[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:FLOGic?
Mask Setup – Lower – Rise – Fail Logic Query

Function

This command reads out the setting value of the criterion for Pass/Fail judgment for the lower limit line of the power-rising part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:LOWer:RISE:FLOGic?

Parameter

<mode>               Criterion for judgment
  ABS                Absolute
  REL                Relative
  OR                 Relative or Absolute
  OFF                Off

Example of Use

To read out the setting value of the judgment criterion for the user-established mask.

PVT:MASK:LIST:LOW:RISE:FLOG?
> OFF,OFF,REL,REL,REL,REL
2.9.20 Lower – Fall – Time
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME
<time>,<time>,<time>,<time>,<time>,<time>

Mask Setup – Lower limits – Fall – Time

Function
This command sets the time point for the lower limit line of the power-falling part on the user-established mask.

Command
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME
<time>,<time>,<time>,<time>,<time>,<time>

Parameter

<time> Time point
Range –8.00 to 8.00
Resolution 0.01 µs
Suffix code NS,US,MS,S
s is used when omitted.

Example of Use
To set the time point of the user-established mask.
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME?

Mask Setup – Lower limits – Fall – Time Query

Function

This command reads out the setting value of the time point for the lower limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:TIME?

Parameter

<time>  Time point
Range   –8.00 to 8.00
Resolution  0.01 µs
Suffix code None

Value is returned in s units.

Example of Use

To read out the time point of the user-established mask.

PVT:MASK:LIST:LOW:FALL:TIME?
> -0.000000400,-0.000000400,-0.000000200,-0.000000200,
  0.000000000,0.000000000
2.9.21 Lower – Fall – Absolute limits

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:ABSolute
<br>,<br>,<br>,<br>,<br>,<br>
Mask Setup – Lower – Fall – Absolute limits

Function
This command sets the absolute reference level for the lower limit line of the power-falling part on the user-established mask.

Command
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:ABSolute
<br>,<br>,<br>,<br>,<br>,<br>

Parameter
<br>
Absolute reference level
Range –99.99 to 99.99
Resolution 0.01 dB
Unit dBm
Suffix code DBM

Example of Use
To set the absolute reference level of the user setting mask.

PVT:MASK:LIST:LOW:FALL:ABS

Mask Setup – Lower – Fall – Absolute limits Query

**Function**

This command reads out the setting value of the absolute reference level for the lower limit line of the power-falling part on the user-established mask.

**Query**

`:SENSe]:PVTime:MASK:LIST:LOWer:FALL:ABSolute?`

**Parameter**

- `<real>`: Absolute reference level
  - Resolution: 0.01 dB
  - Unit: dBm

**Example of Use**

To read out the setting value of the absolute reference level of the user setting mask.

```
PVT:MASK:LIST:LOW:FALL:ABS?
```
2.9.22 Lower – Fall – Relative limits

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL[:RELative]

<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Mask Setup – Lower – Fall – Relative limits

Function

This command sets the relative reference level for the lower limit line of the power-falling part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:RELative <rel_amp>,
<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>,<rel_amp>

Parameter

<rel_amp> Relative reference level

<table>
<thead>
<tr>
<th>Range</th>
<th>-99.99 to 99.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>0.01 dB</td>
</tr>
<tr>
<td>Unit</td>
<td>dB</td>
</tr>
<tr>
<td>Suffix code</td>
<td>DB</td>
</tr>
</tbody>
</table>

dB is used when omitted.

Example of Use

To set the relative reference level of the user setting mask.

PVT:MASK:LIST:LOW:FAIL

-20.00,0.00,0.00,-2.00,-2.00,-99.00
Function

This command reads out the setting value of the relative reference level for the lower limit line of the power-falling part on the user-established mask.

Query

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL[:RELative]?

Parameter

<rel_amp> Relative reference level
  Range -99.99 to 99.99
  Resolution 0.01 dB
  Unit dB

Example of Use

To read out the setting of the relative reference level of the user-established mask.

PVT:MASK:LIST:LOW:FALL:REL?
> -20.00,0.00,0.00,-2.00,-2.00,-99.00
2.9.23 Lower – Fall – Fail Logic

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic
ABSolute|RELative|OR|OFF, ABSolute|RELative|OR|OFF,
ABSolute|RELative|OR|OFF,
Mask Setup – Lower – Fall – Fail Logic

Function
This command sets the criterion for Pass/Fail judgment for the lower
limit line of the power-falling part on the user-established mask.

Command
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic <mode>,
<mode>,<mode>,<mode>,<mode>,<mode>

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Criterion for judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSolute</td>
<td>Absolute</td>
</tr>
<tr>
<td>RELative</td>
<td>Relative (Default)</td>
</tr>
<tr>
<td>OR</td>
<td>Relative or Absolute</td>
</tr>
<tr>
<td>OFF</td>
<td>Off</td>
</tr>
</tbody>
</table>

Example of Use
To set the judgment criterion for the user-established mask.

PVT:MASK:LIST:LOW:FALL:FLOG REL,REL,REL,REL,REL
[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic?

Mask Setup – Lower – Fall – Fail Logic Query

Function

This command reads out the setting value of the criterion for Pass/Fail judgment for the lower limit line of the power-falling part on the user-established mask.

Command

[:SENSe]:PVTime:MASK:LIST:LOWer:FALL:FLOGic?

Parameter

<table>
<thead>
<tr>
<th>&lt;mode&gt;</th>
<th>Criterion for judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Absolute</td>
</tr>
<tr>
<td>REL</td>
<td>Relative</td>
</tr>
<tr>
<td>OR</td>
<td>Relative or Absolute</td>
</tr>
<tr>
<td>OFF</td>
<td>Off</td>
</tr>
</tbody>
</table>

Example of Use

To read out the setting value of the judgment criterion for the user-established mask.

PVT:MASK:LIST:LOW:FALL:FLOG?
> REL,OFF,REL,REL,REL
2.9.24 Storage Mode

[:SENSe]:PVTime:AVERage[:STATe] OFF|ON|0|1

Storage Mode

Function

This command sets Storage Mode.

Command

[:SENSe]:PVTime:AVERage[:STATe] <mode>

Parameter

<mode> Storage Mode
  OFF|0 Off (Default)
  ON|1 On

Example of Use

To set the storage mode to On.

PVT:AVER ON

[:SENSe]:PVTime:AVERage[:STATe]?

Storage Mode Query

Function

This command reads out the Storage Mode setting.

Query

[:SENSe]:PVTime:AVERage[:STATe]?

Response

<mode>

Parameter

<mode> Storage Mode
  0 Off
  1 On

Example of Use

To read out the Storage Mode setting.

PVT:AVER?

> 1
2.9.25 Storage Count

[:SENSe]:PVTime:AVERage:COUNt <integer>

Storage Count

Function

This command sets the Storage Count.

Command

[:SENSe]:PVTime:AVERage:COUNt <integer>

Parameter

<integer> Storage Count
  Range 2 to 9999
  Resolution 1
  Default 2

Example of Use

To set the storage count to 10.

PVT:AVER:COUN 10

[:SENSe]:PVTime:AVERage:COUNt?

Storage Count Query

Function

This command reads out the setting of the Storage Count.

Query

[:SENSe]:PVTime:AVERage:COUNt?

Response

<integer>

Parameter

<integer> Storage Count
  Range 2 to 9999
  Resolution 1

Example of Use

To read out the Storage Count setting.

PVT:AVER:COUN?
  > 10
2.9.26 Average Type

[:SENSe]:PVTime:AVERage:TYPE POWER|LOGPower

Average Type

Function

This command sets Average Type.

Command

[:SENSe]:PVTime:AVERage:TYPE <mode>

Parameter

<mode> Average Type
POWer Power (Default)
LOGPower Log-Power

Example of Use

To set Average Type to Power.

PVT:AVER:TYPE POW

[:SENSe]: PVTime:AVERage:TYPE?

Average Type Query

Function

This command reads out the Average Type setting.

Query

[:SENSe]:PVTime:AVERage:TYPE?

Response

<mode>

Parameter

<mode> Average Type
POW Power
LOGP Log-Power

Example of Use

To read out the Average Type setting.

PVT:AVER:TYPE?
> POW
2.9.27 Filter Type

[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE GAUSsian|5POLe

Filter Type
Function
This command sets the filter type for Power vs Time measurement.

Command
[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE <type>

Parameter
<type>  Filter type
5POLe  5 pole Filter (Default)
GAUSsian  Gaussian Filter

Example of Use
To set Filter Type to Gaussian.
PVT:BAND:TYPE GAUS

[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE?

Filter Type Query
Function
This command queries the filter type for Power vs Time measurement.

Query
[:SENSe]:PVTime:BANDwidth[:RESolution]:TYPE?

Response
<type>

Parameter
<type>  Filter type
5POLe  5 pole Filter
GAUSsian  Gaussian Filter

Example of Use
To query the Filter Type.
PVT:BAND:TYPE?
> GAUS
2.9.28 Filter BW

[:SENSe]:PVTime:BANDwidth[:RESolution] 300Khz|500Khz|1MHZ

Filter Bandwidth

Function

This command sets the filter bandwidth for Power vs Time measurement.

Command

[:SENSe]:PVTime:BANDwidth[:RESolution] <bandwidth>

Parameter

<bandwidth>  Filter Bandwidth
300Khz  300 kHz (Default)
500Khz  500 kHz
1MHZ  1 MHz (Available only for Gaussian Filter)

Example of Use

To set the filter bandwidth to 500 kHz.

PVT:BAND 500K

[:SENSe]:PVTime:BANDwidth[:RESolution]?

Filter Bandwidth Query

Function

This command queries the filter bandwidth for Power vs Time measurement.

Query

[:SENSe]:PVTime:BANDwidth[:RESolution]?

Response

<bandwidth>

Parameter

<bandwidth>  Filter bandwidth
300K  300 kHz
500K  500 kHz
1MHZ  1 MHz

Example of Use

To query the filter bandwidth.

PVT:BAND?

> 500K
2.9.29 Marker – On/Off

:CALCulate:PVTime:MARKer[:STATe] OFF|ON|0|1

Marker – On/Off

Function

This command sets Marker On/Off when Power vs Time is selected.

Command

:CALCulate:PVTime:MARKer[:STATe] <switch>

Parameter

<switch> Marker
0|OFF Off
1|ON On (Default)

Example of Use

To display the marker.

CALC:PVT:MARK 1

:CALCulate:PVTime:MARKer[:STATe]?

Marker – On/Off Query

Function

This command reads out the setting of Marker On/Off when Power vs
Time is selected.

Query

:CALCulate:PVTime:MARKer[:STATe]?

Response

<switch>

Parameter

<switch> Marker
0 Off
1 On

Example of Use

To read out the marker setting.

CALC:PVT:MARK?
> 1
2.9.30 Active Trace

:CALCulate:PVTime:MARKer:ACTive RISE|FALL

Active Trace

Function

This command sets the setting target of the marker when Trace Mode is Rise and Fall.

Command

:CALCulate:PVTime:MARKer:ACTive <mode>

Parameter

<mode>  
RISE  Rise Select (Default)
FALL  Fall Select

Example of Use

To operate the marker displayed in Rise.
CALC:PVT:MARK:ACT RISE

:CALCulate:PVTime:MARKer:ACTive?

Active Trace Query

Function

This command reads out the setting target of the marker when Trace Mode is Rise and Fall.

Query

:CALCulate:PVTime:MARKer:ACTive?

Response

<mode>

Parameter

<mode>  
RISE  Rise Select
FALL  Fall Select

Example of Use

To read out the Active Trace setting.
CALC:PVT:MARK:ACT?
> RISE
2.9.31 Marker Position

:CALCulate:PVTime:MARKer:X[:POINt] <real>

Marker X Axis

Function

This command sets the marker position on the graph in symbol units.

Query

:CALCulate:PVTime:MARKer:X[:POINt] <real>

Response

<real>

Parameter

<real> Marker position

Range

When Trace Mode is Rise and Fall:

Normal Burst or Continuous

\(-13.00+(\text{Slot setting value} \times 156.25)\) to \((\text{Slot setting value} \times 156.25)+13.00\)

Higher Symbol Rate Burst

\(-13.00+(\text{Slot setting value} \times 187.5)\) to \((\text{Slot setting value} \times 187.5)+13.00\)

When Trace Mode is Rise and Fall, and Active Trace is Fall

Select:

Normal Burst or Continuous

\(-13.00 + (\text{Slot setting value} \times 156.25) + 147\) to \((\text{Slot setting value} \times 156.25) + 147 + 13.00\)

Higher Symbol Rate Burst

\(-13.00 + (\text{Slot setting value} \times 187.5) + 176\) to \((\text{Slot setting value} \times 187.5) + 176 + 13.00\)

When Trace Mode is Slot:

Normal Burst or Continuous

\(-18.00+(\text{Slot setting value} \times 156.25)\) to \((\text{Slot setting value} \times 156.25)+147.00+18.00\)

Higher Symbol Rate Burst

\(-18.00+(\text{Slot setting value} \times 187.5)\) to \((\text{Slot setting value} \times 187.5)+176+18.00\)
2.9 Power vs Time

When Trace Mode is Frame:
Normal Burst or Continuous
-18.00 to 1258.75

Higher Symbol Rate Burst
-21.60 to 1510.50
Resolution 0.05
Suffix code None
Default 0.00

Example of Use
To set the graph marker position to 0 point.

CALC:PVT:MARK:X 0

:CALCulate:PVT:MARKer:X[:POINt]?
Marker X Axis Position Query

Function
This command reads out the marker position on the graph in symbol units.

Query
:CALCulate:PVT:MARKer:X[:POINt]?

Response
<real>

Parameter
<real> Marker position
Refer to the description of :CALCulate:PVT:MARKer:X[:POINt].

Example of Use
To read out the setting of the graph marker position.

CALC:PVT:MARK:X?
> 0.00
### 2.9.32 Marker Value

**:CALCulate:PVTme:MARKer:Y[:AVERage]?**

Marker Y Axis Average Value – Query

**Function**

This command reads out Y axis average on the current graph marker.

**Query**

**:CALCulate:PVTme:MARKer:Y[:AVERage]??

**Response**

<real>

**Parameter**

<real>  
Y-axis of the graph marker position

Resolution 0.01 dB

A value in the unit for setting the current Y axis.

**Example of Use**

To read out the average among the Y coordinates at the markers.

CALC:PVT:MARK:Y?

> 0.12
:CALCulate:PVT:MARKer:Y:Maximum?
Marker Y Axis Maximum Value – Query

Function

This command reads out the maximum value among the Y coordinates at the markers on the currently displayed graph.

Query

:CALCulate:PVT:MARKer:Y:MAXimum?

Response

<real>

Parameter

<real> Y coordinate at marker on graph

Resolution 0.01 dB

The value is returned in the unit currently set for the Y axis.

Example of Use

To read out the maximum value among the Y coordinates at the markers.
CALC:PVT:MARK:Y:MAX?
> 0.12
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:CALCulate:PVTimE:MARKer:Y:MINimum?
Marker Y Axis Minimum Value – Query

Function

This command reads out the minimum value among the Y coordinates at the markers on the currently displayed graph.

Query

:CALCulate:PVTimE:MARKer:Y:MINimum?

Response

<real>

Parameter

<real>  Y coordinate at marker on graph
Resolution  0.01 dB
The value is returned in the unit currently set for the Y axis.

Example of Use

To read out the minimum value among the Y coordinates at the markers.
CALC:PVT:MARK:Y:MIN?
> 0.12
Chapter 3  SCPI Status Register

This chapter describes SCPI commands and Status Register to read out application statuses.

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3.2 STATus:QUEStionable Register............................ 3-3
3.3 STATus:OPERation Register ............................... 3-15
Chapter 3  SCPI Status Register

3.1 Reading Out Measurement Status

:STATus:ERRor?
Measurement Status Error Query

Function

This command reads out the measurement status.

Query

:STATus:ERRor?

Response

<status>

Parameter

<status>  Measurement status
Value = bit0 + bit1 + bit2 + bit3 + bit4 + bit5 + bit6
+ bit7 + bit8 + bit9 + bit10 + bit11 + bit12
+ bit13 + bit14 + bit15

bit0 : $2^0 = 1$  Not measured
bit1 : $2^1 = 2$  Exceeded the level.
bit2 : $2^2 = 4$  Signal abnormal
bit3 : $2^3 = 8$  (Not used)
bit4 : $2^4 = 16$  (Not used)
bit5 : $2^5 = 32$  (Not used)
bit6 : $2^6 = 64$  (Not used)
bit7 : $2^7 = 128$  (Not used)
bit8 : $2^8 = 256$  (Not used)
bit9 : $2^9 = 512$  (Not used)
bit10 : $2^{10} = 1024$  (Not used)
bit11 : $2^{11} = 2048$  (Not used)
bit12 : $2^{12} = 4096$  (Not used)
bit13 : $2^{13} = 8192$  (Not used)
bit14 : $2^{14} = 16384$  (Not used)
bit15 : $2^{15} = 32768$  (Not used)

Range 0 to 255

Details

0 is returned when it is terminated normally.

Example of Use

To read out the measurement status.
:STAT:ERR?
> 0
### 3.2 STATus: QUEStionable Register

Figure 3.2-1, Table 3.2-1, Figure 3.2-2, and Table 3.2-2 show the layer structure of the QUEStionable Status register.

#### Table 3.2-1 Bit Definition of QUEStionable Status Register

<table>
<thead>
<tr>
<th>Byte</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB5</td>
<td>Unlock of Reference Clock</td>
</tr>
<tr>
<td>DB9</td>
<td>QUEStionable Measure Register Summary</td>
</tr>
</tbody>
</table>

#### Table 3.2-2 Bit Definition of QUEStionable Measure Register

<table>
<thead>
<tr>
<th>Bit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB5</td>
<td>Level Over</td>
</tr>
<tr>
<td>DB8</td>
<td>The level of the input signal is lower than the detection level.</td>
</tr>
<tr>
<td>DB9</td>
<td>No training sequence has been found.</td>
</tr>
</tbody>
</table>
Table 3.2-3 lists the device messages for the QUESTionable Status register.

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionable Status Register Event</td>
<td>:STATus:QUESTionable[:EVENt]?</td>
</tr>
<tr>
<td>Questionable Status Register Condition</td>
<td>:STATus:QUESTionable:CONDition?</td>
</tr>
<tr>
<td>Questionable Status Register Enable</td>
<td>:STATus:QUESTionable:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:ENABLE?</td>
</tr>
<tr>
<td>Questionable Status Register Negative Transition</td>
<td>:STATus:QUESTionable:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:NTRansition?</td>
</tr>
<tr>
<td>Questionable Status Register Positive Transition</td>
<td>:STATus:QUESTionable:PTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:PTRansition?</td>
</tr>
<tr>
<td>Questionable Measure Register Event</td>
<td>:STATus:QUESTionable:MEASure[:EVENt]?</td>
</tr>
<tr>
<td>Questionable Measure Register Condition</td>
<td>:STATus:QUESTionable:MEASure:CONDition?</td>
</tr>
<tr>
<td>Questionable Measure Register Enable</td>
<td>:STATus:QUESTionable:MEASure:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:MEASure:ENABLE?</td>
</tr>
<tr>
<td>Questionable Measure Register Negative Transition</td>
<td>:STATus:QUESTionable:MEASure:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:MEASure:NTRansition?</td>
</tr>
<tr>
<td>Questionable Measure Register Positive Transition</td>
<td>:STATus:QUESTionable:MEASure:PTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td></td>
<td>:STATus:QUESTionable:MEASure:PTRansition?</td>
</tr>
</tbody>
</table>
**:STATus:QUEStionable[:EVENt]?**

Questionable Status Register Event

**Function**

This command reads the event register of the QUEStionable Status register.

**Query**

`:STATus:QUEStionable[:EVENt]?`

**Response**

<integer>

**Parameter**

<integer>  Byte summation of Event Register
Resolution  1
Range      0 to 65535

**Example of Use**

To read out the contents of the event register of the QUEStionable Status register.
`:STAT:QUES?`
>` 0`
:STATus:QUEStionable:CONDition?

Questionable Status Register Condition

Function
This command reads out the condition register of the QUEStionable Status register.

Query
:STATus:QUEStionable:CONDition?

Response
<integer>

Parameter
<integer> Byte summation of Condition Register
Resolution 1
Range 0 to 65535

Example of Use
To read out the contents of the condition register of the QUEStionable Status register.
:STAT:QUES:COND?
> 0

:STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function
This command sets the event enable register of the QUEStionable Status register.

Command
:STATus:QUEStionable:ENABle <integer>

Parameter
<integer> Bit summation of Event Enable Register
Resolution 1
Range 0 to 65535

Example of Use
To set 16 to the event enable register of the QUEStionable Status Register.
:STAT:QUES:ENAB 16
3.2  \texttt{STATus:QUESTIONable Register}

\textbf{\texttt{:STATus:QUESTIONable:ENABLE?}}

Questionable Status Register Enable Query

\textbf{Function}

This command reads out the event enable register of the QUESTIONable Status register.

\textbf{Query}

\texttt{:STATus:QUESTIONable:ENABLE?}

\textbf{Response}

\texttt{<integer>}

\textbf{Parameter}

\texttt{<integer>}  
Bit summation of Event Enable Register  
Resolution  \texttt{1}  
Range  \texttt{0} to \texttt{65535}

\textbf{Example of Use}

To read out the event enable register of the QUESTIONable Status register.
\texttt{:STAT:QUES:ENAB?}  
\texttt{> 16}

\textbf{\texttt{:STATus:QUESTIONable:NTRansition <integer>}}

Questionable Status Register Negative Transition

\textbf{Function}

This command sets the transition filter (negative transition) of the QUESTIONable Status register.

\textbf{Command}

\texttt{:STATus:QUESTIONable:NTRansition <integer>}

\textbf{Parameter}

\texttt{<integer>}  
Bit summation of Transition Filter (negative transition)  
Resolution  \texttt{1}  
Range  \texttt{0} to \texttt{65535}

\textbf{Example of Use}

To set 16 to the transition filter (negative transition) of the QUESTIONable Status register.
\texttt{:STAT:QUES:NTR 16}
Chapter 3  SCPI Status Register

:STATus:QUESTionable:NTRansition?
Questionable Status Register Negative Transition Query

Function

This command reads out the transition filter (negative transition) of the QUESTionable Status register.

Query

:STATus:QUESTionable:NTRansition?

Response

<integer>

Parameter

<integer>  Bit summation of Transition Filter (negative transition)
Resolution  1
Range 0 to 65535

Example of Use

To read out the transition filter (negative transition) of the QUESTionable Status register.
:STAT:QUES:NTR?
> 16

:STATus:QUESTionable:PTransition <integer>
Questionable Status Register Positive Transition

Function

This command sets the transition filter (Positive transition) of the QUESTionable Status register.

Command

:STATus:QUESTionable:PTransition <integer>

Parameter

<integer>  Bit summation of Transition Filter (positive transition)
Resolution  1
Range 0 to 65535

Example of Use

To set 16 to the transition fileter (positive transition) of the QUESTionable status register.
:STAT:QUES:PTR 16
**:STATus:QUESTionable:PTRansition?**

Questionable Status Register Positive Transition Query

**Function**

This command reads out the transition filter (positive transition) of the QUESTionable Status Register.

**Query**

`:STATus:QUESTionable:PTRansition?`

**Response**

`<integer>`

**Parameter**

`<integer>` Bit summation of Transition Filter (positive transition)

Resolution 1

Range 0 to 65535

**Example of Use**

To read out the transition filter (positive transition) of the QUESTionable Status Register.

`:STAT:QUES:PTR?`

> 16
:STATus:QUESTionable:MEASure[:EVENt]?

Questionable Measure Register Event

Function

This command reads out the event register of the QUESTionable Measure Register.

Query

:STATus:QUESTionable:MEASure[:EVENt]?

Response

<integer>

Parameter

<integer>   Bit summation of Event Register
Resolution   1
Range        0 to 65535

Example of Use

To read out the contents of the event register of the QUESTionable Measure Register.
:STAT:QUES:MEAS?
> 0
3.2 \texttt{:STATus:QUEStionable Register}

\textbf{:STATus:QUEStionable:MEASure:CONDition?}

Questionable Measure Register Condition

\textbf{Function}
This command reads out the condition register of the QUEStionable Measure register.

\textbf{Query}
\texttt{:STATus:QUEStionable:MEASure:CONDition?}

\textbf{Response}
<integer>

\textbf{Parameter}
<integer> Bit summation of Condition Register
Resolution 1
Range 0 to 65535

\textbf{Example of Use}
To read out the contents of the condition register of the QUEStionable Measure register.
\texttt{:STAT:QUES:MEAS:COND?}  
\texttt{> 0}

\textbf{:STATus:QUEStionable:MEASure:ENABle <integer>}

Questionable Measure Register Enable

\textbf{Function}
This command sets the event enable register of the QUEStionable Measure register.

\textbf{Command}
\texttt{:STATus:QUEStionable:MEASure:ENABle <integer>}

\textbf{Parameter}
<integer> Bit summation of Event Enable Register
Resolution 1
Range 0 to 65535

\textbf{Example of Use}
To set 16 to the event enable register of the QUEStionable Measure register.
\texttt{:STAT:QUES:MEAS:ENAB 16}
**Chapter 3  SCPI Status Register**

### :STATus:QUEStionable:MEASure:ENABle?

**Questionable Measure Register Enable Query**

**Function**

This command reads out the event enable register of the QUEStionable Measure register.

**Query**

`:STATus:QUEStionable:MEASure:ENABle?`

**Response**

<integer>

**Parameter**

<integer>  Bit summation of Event Enable Register
Resolution  1
Range  0 to 65535

**Example of Use**

To read out the event enable register of the QUEStionable Measure Register.

`:STAT:QUES:MEAS:ENAB?`

> 16

### :STATus:QUEStionable:MEASure:NTRansition <integer>

**Questionable Measure Register Negative Transition**

**Function**

This command sets the transition filter (negative transition) of the QUEStionable Measure register.

**Command**

`:STATus:QUEStionable:MEASure:NTRansition <integer>`

**Parameter**

<integer>  Bit summation of Transition Filter (negative transition)
Resolution  1
Range  0 to 65535

**Example of Use**

To set 16 to the transition filter (negative transition) of the QUEStionable Measure register.

`:STAT:QUES:MEAS:NTR 16`
3.2 STATus:QUESTionable Register

:STATus:QUESTionable:MEASure:NTRansition?
Questionable Measure Register Negative Transition Query

Function
This command reads out the transition filter (negative transition) of the QUESTionable Measure register.

Query
:STATus:QUESTionable:MEASure:NTRansition?

Response
<integer>

Parameter
<integer> Bit summation of Transition Filter (negative transition)
Resolution 1
Range 0 to 65535

Example of Use
To read out the transition filter (negative transition) of the QUESTionable Measure register.
:STAT:QUES:MEAS:NTR?
> 16

:STATus:QUESTionable:MEASure:PTRansition <integer>
Questionable Measure Register Positive Transition

Function
This command sets the transition filter (positive transition) of the QUESTionable Measure register.

Command
:STATus:QUESTionable:MEASure:PTRansition <integer>

Parameter
<integer> Bit summation of Transition Filter (positive transition)
Resolution 1
Range 0 to 65535

Example of Use
To set 16 to the transition filter (positive transition) of the QUESTionable Measure register.
:STAT:QUES:MEAS:PTR 16
:STATus:QUESTionable:MEASure:PTRansition?
Questionable Measure Register Positive Transition Query

Function

This command reads out the transition filter (positive transition) of the QUESTionable Measure register.

Query

:STATus:QUESTionable:MEASure:PTRansition?

Response

<integer>

Parameter

<integer>  Bit summation of Transition Filter (positive transition)
Resolution  1
Range       0 to 65535

Example of Use

To read out the transition filter (positive transition) of the QUESTionable Measure register.
:STAT:QUES:MEAS:PTR?
> 16
3.3 STATus:OPERation Register

Figure 3.3-1 and Table 3.3-1 show the layer structure of the OPERation Status register.

CALibrating DB0
SETTling DB1
RANGing (NOT USED) DB2
SWEeping DB3
MEASuring DB4
Waiting for TRIG DB5
Waiting for ARM (NOT USED) DB6
CORRecting (NOT USED) DB7
FILE Operating DB8
NOT USED DB9
NOT USED DB10
NOT USED DB11
NOT USED DB12
INSTrument (NOT USED) DB13
PROgram (NOT USED) DB14
NOT USED DB15

Table 3.3-1 Definition of OPERation Status register

<table>
<thead>
<tr>
<th>Byte</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB0</td>
<td>CAL is in execution.</td>
</tr>
<tr>
<td>DB1</td>
<td>Warm Up message is being displayed.</td>
</tr>
<tr>
<td>DB3</td>
<td>During measurement (including trigger wait, and 1 is returned in Continuous mode)</td>
</tr>
<tr>
<td>DB5</td>
<td>Waiting for trigger</td>
</tr>
<tr>
<td>DB8</td>
<td>File is in operation.</td>
</tr>
</tbody>
</table>

Table 3.3-2 lists device messages for the OPERation Status register.

Table 3.3-2 Device messages for the OPERation Status Register

<table>
<thead>
<tr>
<th>Function</th>
<th>Device Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Status Register Event</td>
<td>:STATus:OPERation[:EVENT]?</td>
</tr>
<tr>
<td>Operation Status Register Condition</td>
<td>:STATus:OPERation:CONDition?</td>
</tr>
<tr>
<td>Operation Status Register Enable</td>
<td>:STATus:OPERation:ENABLE &lt;integer&gt;</td>
</tr>
<tr>
<td>Operation Status Register Negative Transition</td>
<td>:STATus:OPERation:NTRansition &lt;integer&gt;</td>
</tr>
<tr>
<td>Operation Status Register Positive Transition</td>
<td>:STATus:OPERation:PTRansition &lt;integer&gt;</td>
</tr>
</tbody>
</table>
Chapter 3  SCPI Status Register

:STATus:OPERation[:EVENt]?
Operation Status Register Event

Function

This command reads out the event register of the OPERation Status Register.

Query

:STATus:OPERation[:EVENt]?

Response

<integer>

Parameter

<integer>  Bit summation of Event Register
Resolution  1
Range  0 to 65535

Example of Use

To read out the contents of the event register of the OPERation Status Register.
:STAT:OPER?
> 0
3.3 STATus:OPERation Register

:STATus:OPERation:CONDition?
Operation Status Register Condition

Function
This command reads out the condition register of the OPERation Status Register.

Query
:STATus:OPERation:CONDition?

Response
<integer>

Parameter
<integer> Bit summation of Condition Register
Resolution 1
Range 0 to 65535

Example of Use
To read out the contents of the condition register of the OPERation Status Register.
:STAT:OPER:COND?
> 0

:STATus:OPERation:ENABle <integer>
Operation Status Register Enable

Function
This command sets the event enable register of the OPERation Status Register.

Command
:STATus:OPERation:ENABle <integer>

Parameter
<integer> Bit summation of Event Enable Register
Resolution 1
Range 0 to 65535

Example of Use
To set 16 to the event enable register of the OPERation Status Register.
:STAT:OPER:ENAB 16
Chapter 3  SCPI Status Register

:STATus:OPERation:ENABle?
Operation Status Register Enable Query

Function

This command reads out the event enable register of the OPERation Status Register.

Query

:STATus:OPERation:ENABle?

Response

<integer>

Parameter

<integer>  Bit summation of Event Enable Register
Resolution  1
Range      0 to 65535

Example of Use

To read out the event enable register of the OPERation Status Register.
:STAT:OPER:ENAB?
> 16

:STATus:OPERation:NTRansition <integer>
Operation Status Register Negative Transition

Function

This command sets the transition filter (negative transition) of the OPERation Status Register.

Command

:STATus:OPERation:NTRansition <integer>

Parameter

<integer>  Bit summation of Transition Filter (negative transition)
Resolution  1
Range      0 to 65535

Example of Use

To set 16 to the transition filter (negative transition) of the OPERation Status register.
:STAT:OPER:NTR 16
3.3 STATus:OPERation Register

:STAT:OPER:NTRansition?
Operation Status Register Negative Transition Query

Function
This command reads out the transition filter (negative transition) of the OPERation Status Register.

Query
:STAT:OPER:NTRansition?

Response
<integer>

Parameter
<integer> Bit summation of Transition Filter (negative transition)
Resolution 1
Range 0 to 65535

Example of Use
To read out the transition filter (negative transition) of the OPERation Status register.
:STAT:OPER:NTR?
> 16
:STATus:OPERation:PTRansition <integer>
Operation Status Register Positive Transition

Function

This command sets the transition filter (positive transition) of the OPERation Status Register.

Command

:STATus:OPERation:PTRansition <integer>

Parameter

<integer>   Bit summation of Transition Filter (positive transition)
Resolution    1
Range         0 to 65535

Example of Use

To set 16 to the transition filter (positive transition) of the OPERation Status Register.
:STAT:OPER:PTR 16
:STATus:OPERation:PTRansition?
Operation Status Register Positive Transition Query

Function
This command reads out the transition filter (positive transition) of the OPERation Status Register.

Query
:STATus:OPERation:PTRansition?

Response
<integer>

Parameter
<integer>  Bit summation of Transition Filter (positive transition)
Resolution  1
Range       0 to 65535

Example of Use
To read out the transition filter (positive transition) of the OPERation Status Register.
:STAT:OPER:PTR?
> 16