# MX269022A
# LTE TDD Downlink Measurement Software
# Operation Manual
# Remote Control

**15th 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) or MS2830A Signal Analyzer Operation Manual (Mainframe Operation) and MX269022A LTE TDD Downlink Measurement Software Operation Manual (Operation). Please also refer to these documents before using the equipment.**
- **Keep this manual with the equipment.**

**ANRITSU CORPORATION**

Document No.: M-W3210AE-15.0

# Safety Symbols

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

## Symbols used in manual

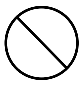
**DANGER** This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

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

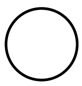
**CAUTION** This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

## Safety Symbols Used on Equipment and in Manual

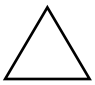
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



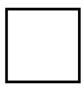
This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



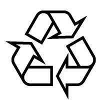
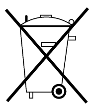
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



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.

MX269022A
LTE TDD Downlink Measurement Software
Operation Manual Remote Control

15 May 2009 (First Edition)
23 June 2016 (15th Edition)

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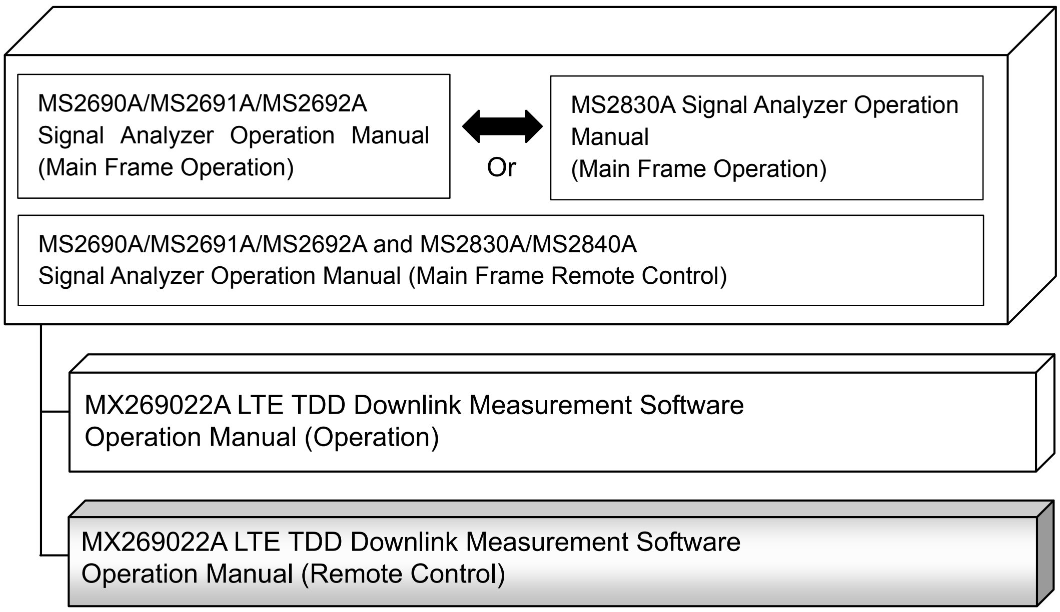
Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.
When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

# About This Manual

■ Composition of Operation Manuals

The operation manuals for MX269022A LTE TDD Downlink Measurement Software are comprised as shown in the figure below.




- Signal Analyzer Operation Manual (Mainframe Operation)
- Signal Analyzer Operation Manual (Mainframe Remote Control)

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

- MX269022A LTE TDD Downlink Measurement Software Operation Manual (Operation)

This manual describes operating methods of the MX269022A LTE TDD Downlink Measurement Software.

- MX269022A LTE TDD Downlink Measurement Software Operation Manual (Remote Control) <This document>

This manual describes remote control of the MX269022A LTE TDD Downlink Measurement Software.

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# Chapter 1 Outline



This chapter provides an overview of the remote control of the MX269022A LTE TDD Downlink Measurement Software (hereinafter, referred to as "this application").

# 1.1 Outline

This application can be controlled from an external controller (PC) by remote control commands using the MS2690A/MS2691A/MS2692A or MS2830A Signal Analyzer. Remote control commands for this application are in the SCPI format defined by the SCPI Consortium.

## 1.1.1 Interface

This instrument has GPIB, Ethernet, and USB interfaces for remote control. Only one interface can be used at a time.

The interface is determined automatically when a command is received at the start of communication. The interface enters the remote state when a remote command is detected from the external controller (PC). At remote-interface operation, the front panel Remote lamp lights; the lamp is off at local-interface Operation.

Refer to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Operation Manual (Mainframe Remote Control)* for more details about remote control and interface setting.

## 1.1.2 Controlled Application

Two kinds of remote control commands can be used with this instrument: commands that are common to all applications (hereafter common commands), and 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, when a command unique to a specific application is executed at another application, the command is not executed and 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 performs a measurement for 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. In order to execute a function unique to the application by using remote control, you need to select this application once it has been activated. Furthermore, this application can be executed at the same time as another application that uses by itself a resource not used by this application, such as the Vector Signal Generator.

1

Outline

# 1.2 Basic Flow of Control

This part explains the basic remote control command programming for measuring a LTE TDD Downlink signal.

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 change).

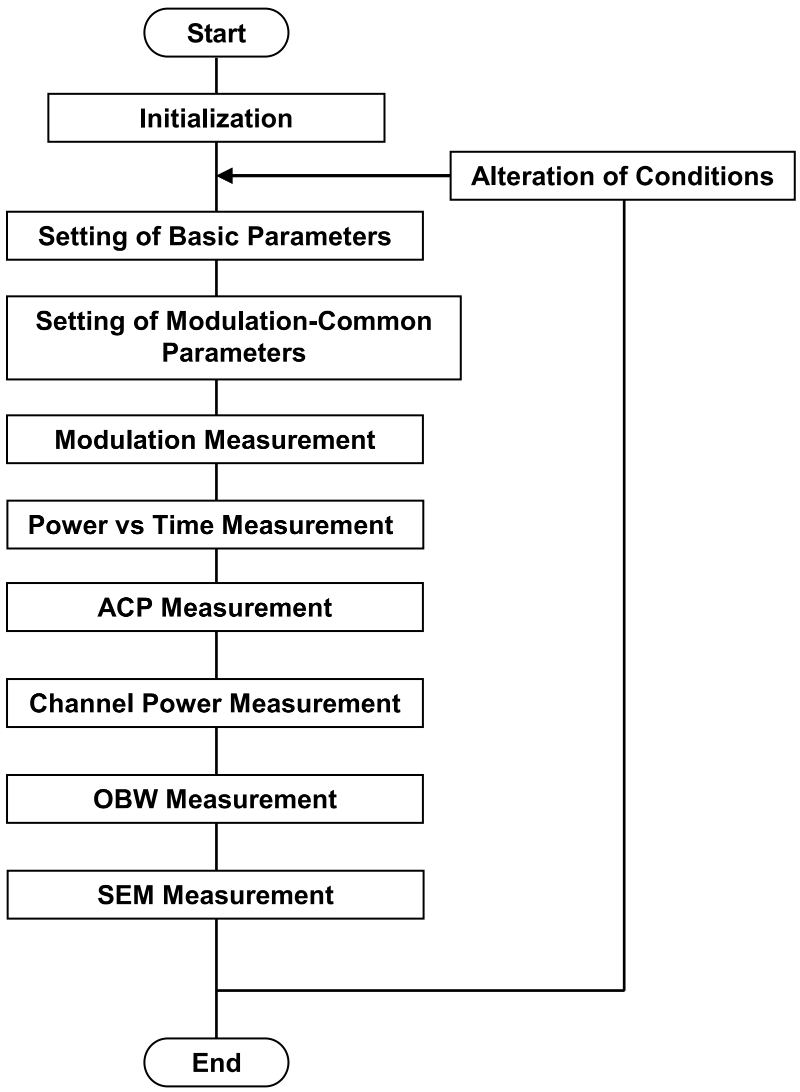


**Figure 1.2-1 Flow of Basic Test**

(1) Initialization

The communication interface and the parameters are initialized, the communication mode is set, and the application is started and selected.

☞ 1.2.1 Initialization

(2) Setting of Basic Parameters

The parameters used in common by all measurement functions to be executed in this application are set, including the carrier frequency and input level.

☞ 1.2.2 Setting of Basic Parameters

(3) Setting of Modulation-Common Parameters

The parameters used in common by the modulation measurement function to be executed in this application are set. These parameters are used to set a trigger, modulation mode, bandwidth, and other items.

☞ 1.2.3 Setting of Modulation-Common Parameters

(4) Modulation Measurement

The measurement functions to be executed in this application are executed. First, the modulation measurement function is selected. Next, the trace mode, storage mode, and other items are set for each measurement function, and then the measurement is executed and the measurement results are read.

☞ 1.2.4 Modulation Measurement

(5) Power vs Time Measurement

The Power vs Time measurement functions to be executed this application are executed. First, the Power vs Time measurement function is selected. Next, the sync parameters are set for each measurement function, and then the measurement is executed and the measurement results are read.

☞ 1.2.5 Power vs Time Measurement

(6) MIMO Summary Measurement

MIMO Summary measurement is executed using this application. First, select the measurement functions to be executed. Next, the sync parameters are set for each measurement function, and then the measurement is executed and the measurement results are read.

☞ 1.2.6 MIMO Summary Measurement

(7) ACP/Channel Power/OBW/SEM Measurement

The measurement functions to be executed in the Signal Analyzer or Spectrum Analyzer are executed. First, the parameters used in common by the Signal Analyzer or Spectrum Analyzer function are set. Next, the application and the measurement functions for each measurement are selected, the trigger mode, storage mode, BW, analysis time, sweep time, trace point, and other items to be used for the measurement are set, and then the measurement is executed and the measurement results are read.

☞ 1.2.7 ACP Measurement
☞ 1.2.8 Channel Power Measurement
☞ 1.2.9 OBW Measurement
☞ 1.2.10 SEM Measurement

## 1.2.1 Initialization

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) Initialization of Communication Interface
The remote control interface to be used is initialized so sending and receiving of commands can start. Refer to the operation manual of the interface used, for details about the remote control interface.

(2) Setting Language Mode and Response Mode
The language mode and the response mode used to communicate are set. Refer to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Operation Manual (Mainframe Remote Control)* for details about the language mode and response mode.

(3) Starting Application
The application is started. In addition to this application, the Signal Analyzer and Spectrum Analyzer applications are also started.

(4) Selecting Application
The 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 mode. To select single measurement mode, switch to the single measurement mode.

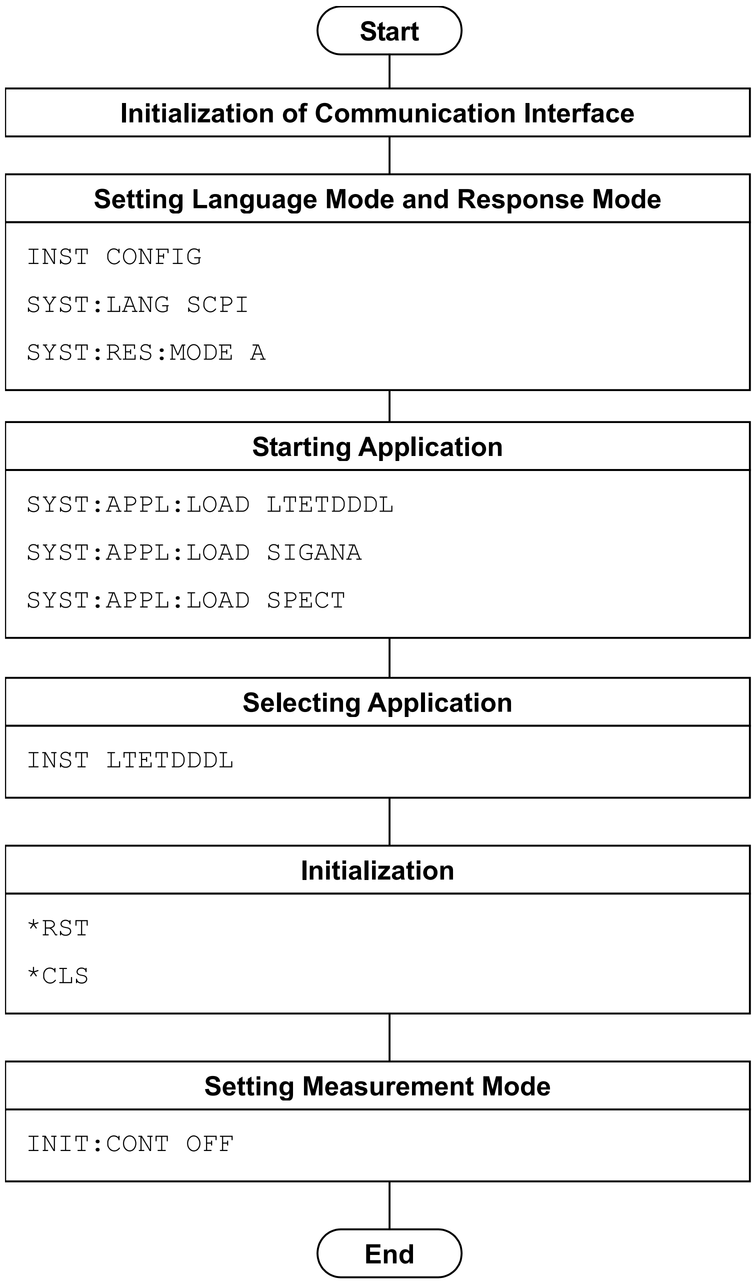


**Figure 1.2.1-1 Initialization Flow and Command Example**

## 1.2.2 Setting of Basic Parameters

Set the parameters used in common for to all measurements using this application, the Signal Analyzer, and the Spectrum Analyzer. The basic parameters include the following.

(1) Carrier Frequency

(2) Input Level (Reference Level/Attenuator)

(3) Level Offset

(4) Pre-Amp (Option)

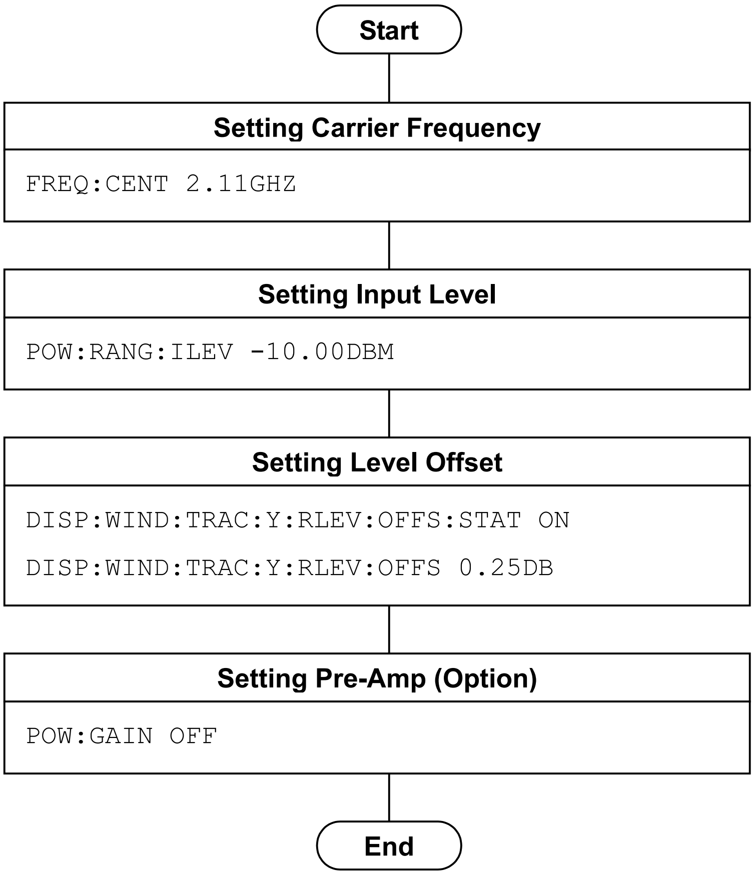


**Figure 1.2.2-1 Flow of Basic Parameter Setting and Command Example**

### 1.2.3 Setting of Modulation-Common Parameters

Set the parameters used in common for the Modulation 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) Channel Bandwidth
(3) Test Model
(4) Uplink-downlink Configuration
(5) Special Subframe Configuration
(6) Synchronization Mode
(7) Reference Signal
  (a) Cell ID
  (b) Power Boosting
  (c) Number of Antenna Ports
  (d) Antenna Port
(8) PDSCH Modulation Scheme
(9) Total EVM Calculation
(10) EVM Window Length
(11) PBCH/P-SS/PDCCH/PCFICH/PHICH/PDSCH
  (a) On/Off (Except PDSCH)
  (b) Power Boosting Auto/Manual
  (c) Power Boosting Level
(12) PHICH Ng/Duration
(13) Number of PDCCH Symbols (Subframe 1 and 6/Other Subframe)
(14) PDCCH Mapping
(15) PDCCH Format
(16) Number of PDCCHs
(17) Channel Estimation
(18) DwPTS
(19) PDSCH EVM Calculation

**Start**

**Setting Trigger**

```
TRIG ON
TRIG:SOUR EXT
TRIG:DEL 0
```

**Setting Channel Bandwidth**

```
RAD:CBAN 5
```

**Setting Test Model and Synchronization Mode**

```
RAD:TMOD OFF
RAD:SYNC:MODE SS
```

**Setting Reference Signal**

```
CALC:EVM:RSIG:POW:BOOS 0
CALC:EVM:ANT:NUMB 1
CALC:EVM:APOR 0
```

**Setting PDSCH Modulation Scheme**

```
CALC:EVM:PDSC:MOD AUTO
```

**Setting Total EVM Calculation and EVM Window Length**

```
CALC:EVM:DWPT INCL
CALC:EVM:TEVM:RS INCL
CALC:EVM:TEVM:PDSC INCL
CALC:EVM:TEVM:PBCH INCL
CALC:EVM:TEVM:PDCC INCL
CALC:EVM:TEVM:PCF INCL
CALC:EVM:TEVM:PHIC INCL
CALC:EVM:WLEN 10
```

**Setting Channels**

```
CALC:EVM:PBCH ON
CALC:EVM:PBCH:POW:AUTO ON
CALC:EVM:PSS ON
CALC:EVM:PSS:POW:AUTO ON
CALC:EVM:SSS ON
CALC:EVM:SSS:POW:AUTO ON
CALC:EVM:PHIC ON
CALC:EVM:PHIC:POW:AUTO ON
CALC:EVM:PHIC:NG R1BY6
CALC:EVM:PDCC ON
CALC:EVM:PDCC:POW:AUTO ON
CALC:EVM:PDCC:SYMB:AUTO ON
CALC:EVM:PDCC:MAPP:FORM 1
CALC:EVM:PDCC:MAPP:NUMB 2
CALC:EVM:PCF ON
CALC:EVM:PCF:POW:AUTO ON
CALC:EVM:PDSC:POW:AUTO ON
```

**Setting Channel Estimation**

```
CALC:EVM:CHAN:EST ON
```

**End**

**Figure 1.2.3-1 Flow of Common Settings for Modulation and Command Example**

### 1.2.4 Modulation Measurement

The Modulation measurement is executed in the following order:

(1) Selecting measurement function

(2) Setting measurement parameters
The following parameters are only applied to Modulation measurement:

(a) Starting Subframe Number

(b) Measurement Interval

(c) Storage

(3) Measuring and reading results

(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) Frame Offset

(c) Scale

(d) Marker

Start

**Selecting Measurement Function**

```
CONF:EVM
```

**Setting Measurement Parameters**

```
EVM:CAPT:TIME:STAR 0
EVM:CAPT:TIME:LENG 50
EVM:AVER ON
EVM:AVER:COUN 10
```

**Performing Measurement and Reading Out Measured Results**

```
READ:EVM?
STAT:ERR?
```

**Setting Contents to Be Displayed (as required)**

```
DISP:EVM:SEL EVS
DISP:EVM:WIND:TRAC:X:FRAM:OFFS 1
DISP:EVM:WIND2:TRAC:Y:SPAC DB
DISP:EVM:WIND2:TRAC:Y:RLEV 0
CALC:EVM:WIND2:SYMB:NUMB 110
CALC:EVM:MARK ON
CALC:EVM:MARK:ACT CONS
CALC:EVM:MARK:SUBC 100
CALC:EVM:MARK:X?
CALC:EVM:MARK:Y?
```

End

**Figure 1.2.4-1 Flow of Modulation Measurement and Command Example**

## 1.2.5 Power vs Time Measurement

The Power vs Time measurement is executed in the following order:

(1) Selecting measurement function

(2) Setting common parameters

The following parameters are common parameters with the Modulation measurement:

(a) Channel Bandwidth

(b) Test Model

(c) Uplink-downlink Configuration

(d) Special Subframe Configuration

(e) Synchronization Mode

(f) Reference Signal

(f-1) Cell ID

(f-2) Power Boosting

(f-3) Number of Antenna Ports

(f-4) Antenna Port

***Note:***

- It is not necessary to restart when the settings in section 1.2.3 “Setting of Modulation-Common Parameters” have already been made.

- When the measurement is performed at Pre-Amp Mode = On, the settings for Synchronization Mode and Reference Signal are not required.

(3) Setting measurement parameters
The following parameters are only applied to Power vs Time measurement:

(a) Wide Dynamic Range

(b) Noise Correction

(c) Pre-Amp Mode

(d) Select Mask

(e) Mask Setup

(f) Smoothing

(g) Storage

(4) Executing measurement and reading measurement results

(5) Setting the display content
This setting is required for displaying measurement 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) Marker

Start

**Selecting Measurement Function**

```
CONF:PVT
```

**Setting Channel Bandwidth**

```
RAD:CBAN 5
```

**Setting Test Model and Synchronization Mode**

```
RAD:TMOD OFF
RAD:UDC 0
RAD:SSC 0
RAD:SYNC:MODE SS
```

**Setting Reference Signal**

```
CALC:EVM:RSIG:POW:BOOS 0
CALC:EVM:ANT:NUMB 1
CALC:EVM:APOR 0
```

**Setting Measurement Parameters**

```
PVT:WDR ON
PVT:NCOR ON
PVT:PAM OFF
PVT:MASK:SEL STAN
PVT:SMO ON
PVT:SMO:LENG 101
PVT:AVER ON
PVT:AVER:COUN 20
```

**Performing Measurement and Reading Out Measured Results**

```
READ:PVT?
```

**Setting Contents to Be Displayed (as required)**

```
CALC:PVT:WIND2:MARK:MAX
*WAI
CALC:PVT:WIND2:MARK:POW:ABS?
```

End

**Figure 1.2.5-1 Flow of Power vs Time Measurement and Command Example**

**Note:**

1. When Wide Dynamic Range is changed to On, Pre-Amp is switched to Off automatically.

2. Noise Correction and Pre-Amp Mode can be set when Wide Dynamic Range is On.

3. Both Noise Correction and Pre-Amp Mode cannot be set to On at the same time.

4. Pre-Amp Mode can be set when Trigger Switch is On.

### 1.2.6 MIMO Summary Measurement

The MIMO Summary measurement is executed in the following order:

(1) Selecting the measurement function.

(2) Setting common parameters

The following parameters are common parameters with the Modulation measurement:

(a) Channel Bandwidth

(b) Test Model

(c) Uplink-downlink Configuration

(d) Special Subframe Configuration

(e) Synchronization Mode

(f) Reference Signal

(f-1) Cell ID

(f-2) Power Boosting

(f-3) Number of Antenna Ports

(f-4) Antenna Port

***Note:***

1. It is not necessary to restart when the settings in section 1.2.3 “Setting of Modulation-Common Parameters” have already been made.

2. Unlike the Modulation measurement, the number of each Antenna Port’s signal, which is set under Number of Antenna Ports, becomes the measurement target. Excluding few exceptions, the measurement result is the relative value with reference to the specified Antenna Port.

(3) Setting measurement parameters

The following parameters are only applied to Power vs Time measurement:

(a)Active Antenna Threshold

(4) Executing measurement and querying the result

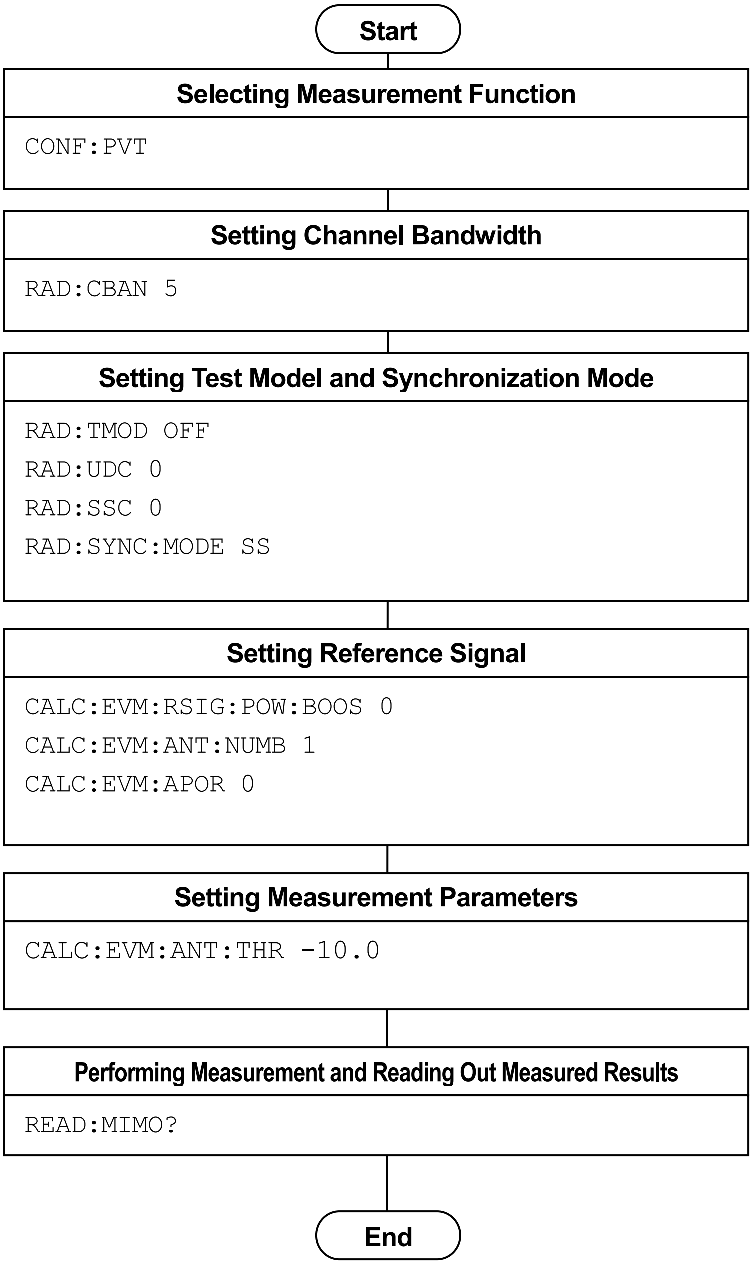


**Figure 1.2.6-1 Flow of MIMO Summary Measurement and Command Example**

### 1.2.7 ACP (Adjacent Channel Power) Measurement

The ACP measurement is executed in the following order:

(1) Selecting application and the measurement function
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the ACP measurement function. The application will be switched to the selected one if the ACP measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the command/query available in the selected application can be used.

***Note:***

The ACP measurement function of the Spectrum Analyzer is enabled in this application only when Channel Bandwidth is set to 1.4, 3, or 5 MHz.

(2) Setting measurement parameters
The following parameters apply only to the specific application selected.

(a) Trigger

(b) Time Length/Filter Type/Storage, etc. (in Signal Analyzer)

(c) Sweep Time/Filter Type/Storage, etc. (in Spectrum Analyzer)

(3) Measuring and reading results

(4) Set the display content
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

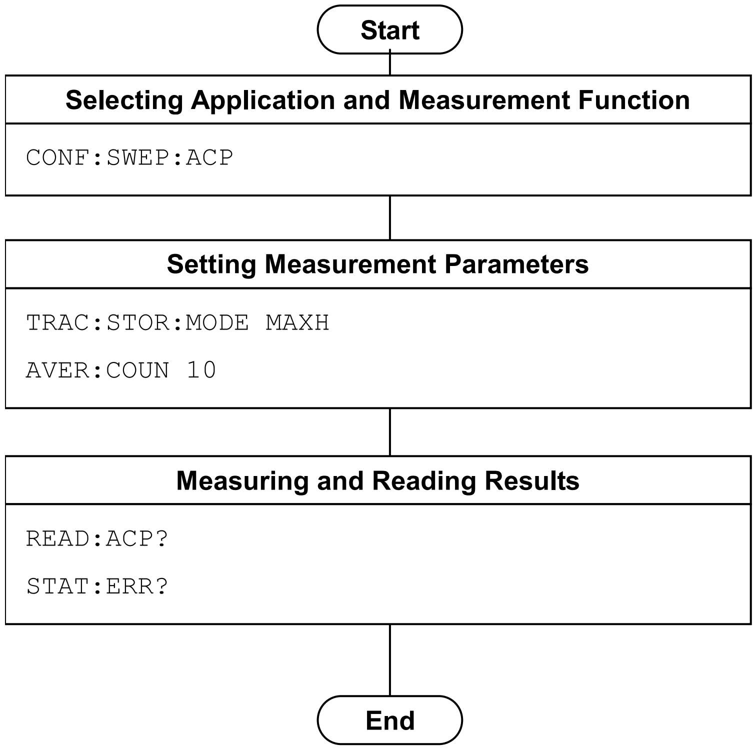


**Figure 1.2.7-1 Flow of ACP Measurement using Spectrum Analyzer and Command Example**

## 1.2.8 Channel Power Measurement

The Channel Power measurement is executed in the following order:

(1) Selecting application and the measurement function
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the Channel Power measurement function. The application will be switched to the selected one if the Channel Power measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the commands/queries available in the selected application 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, etc. (in Signal Analyzer)

(c) Sweep Time/Filter Type/Storage, etc. (in Spectrum Analyzer)

(3) Measuring and reading results

(4) Set the display content
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

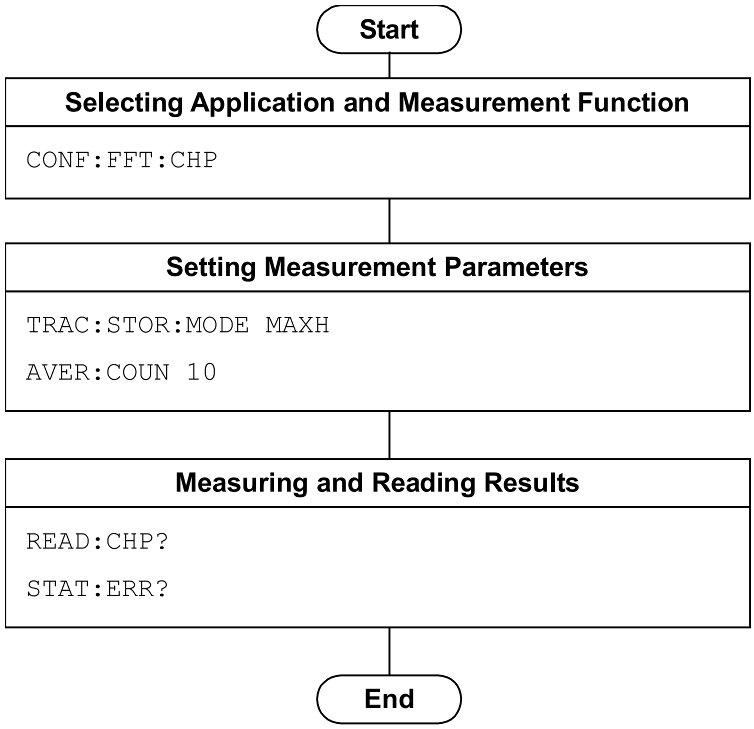


**Figure 1.2.8-1 Flow of Channel Power Measurement using Signal Analyzer and Command Example**

## 1.2.9 OBW (Occupied Bandwidth) Measurement

The OBW measurement is executed in the following order:

(1) Selecting application and the measurement function
Select either Signal Analyzer or Spectrum Analyzer as the application to execute the OBW measurement function. The application will be switched to the selected one if the OBW measurement function is selected. The basic parameter value is reflected to the selected application. Subsequently, only the commands/queries available in the selected application can be used.

(2) Setting measurement parameters
The following parameters apply only to the specific application selected.

(a) Trigger

(b) Method/N% Ratio/XdB Value, etc.

(3) Measuring and reading results

(4) Set the display content
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

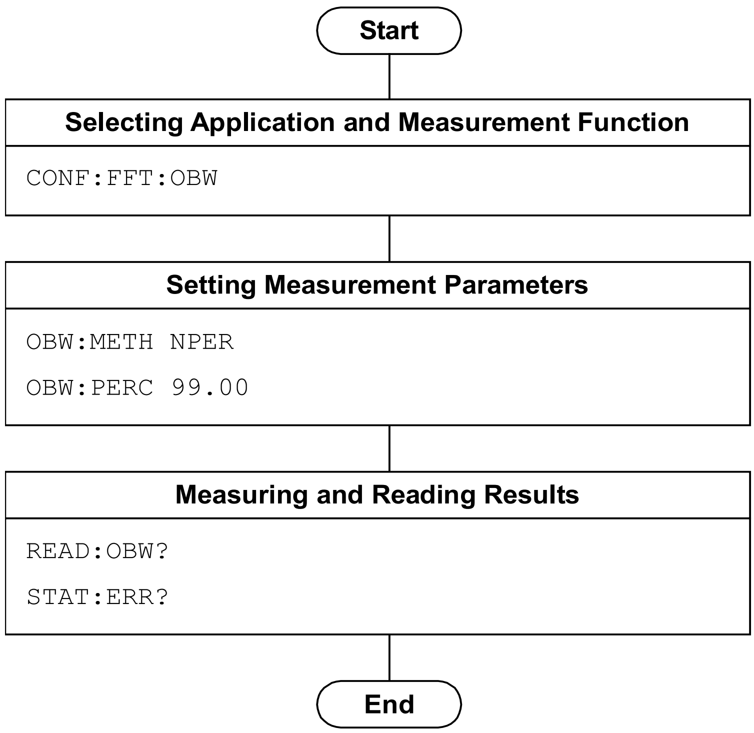


**Figure 1.2.9-1 Flow of OBW Measurement using Signal Analyzer and Command Example**

## 1.2.10 SEM (Spectrum Emission Mask) Measurement

The SEM measurement is executed in the following order:

(1) Selecting the measurement function
The application will be switched to the Spectrum Analyzer if the SEM measurement function is selected. The basic parameter value is reflected to the Spectrum Analyzer. Subsequently, only the commands/queries available in the Spectrum Analyzer can be used.

***Note:***

The SEM measurement function is effective only in the Spectrum Analyzer.

(2) Setting measurement parameters
The following parameters apply only to the Spectrum Analyzer.
  (a) Trigger
  (b) Limit Side/Filter Type/Storage, etc.

(3) Measuring and reading results

(4) Set the display content
This setting is for displaying the result on the screen. However, you do not need to perform the setting if you only query the result through remote control.

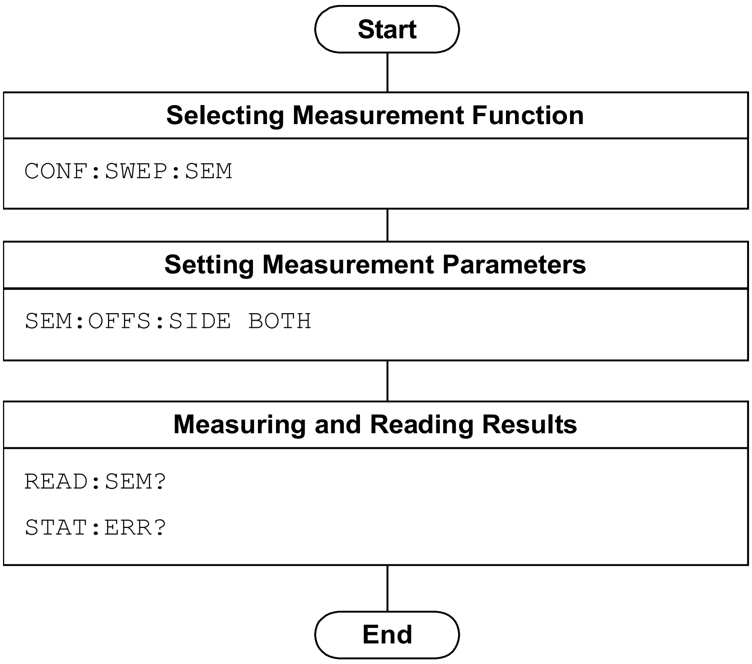


**Figure 1.2.10-1 Flow of SEM Measurement using Spectrum Analyzer and Command Example**

### 1.2.11 Signal Analyzer/Spectrum Analyzer Switching

There are the following two methods for switching from this application to Signal Analyzer/Spectrum Analyzer during remote control.

(1) Execute `CONFigureure[:FFT|SWEPt]:<measure>`
The basic parameters such as the carrier frequency/input level (reference level) are reflected to the selected application. Furthermore, a template is automatically set depending on the state of this application. There is no limitation on control of the selected application.

***Note:***

It is not likely to be able to execute it by selecting application and the measurement function to use.

Also, you can switch between Signal Analyzer and Spectrum Analyzer by using `CONFigureure:FFT|SWEPt:<measure>`. In the same way, the template and the basic parameters such as the carrier frequency/input level (reference level) are reflected.

Similarly, the template and the basic parameters such as the carrier frequency/input level (reference level) changed in Signal Analyzer or Spectrum Analyzer are reflected, when returning to the control of the measurement application by `CONFigureure:<measure>`.

Compared with method (2), you can shorten the execution time of the program, since you do not need to reset the basic parameter per a measurement function.

(2) Execute `:INSTrument[:SELect] SIGANA|SPECT`
No parameter and template are reflected in this method.

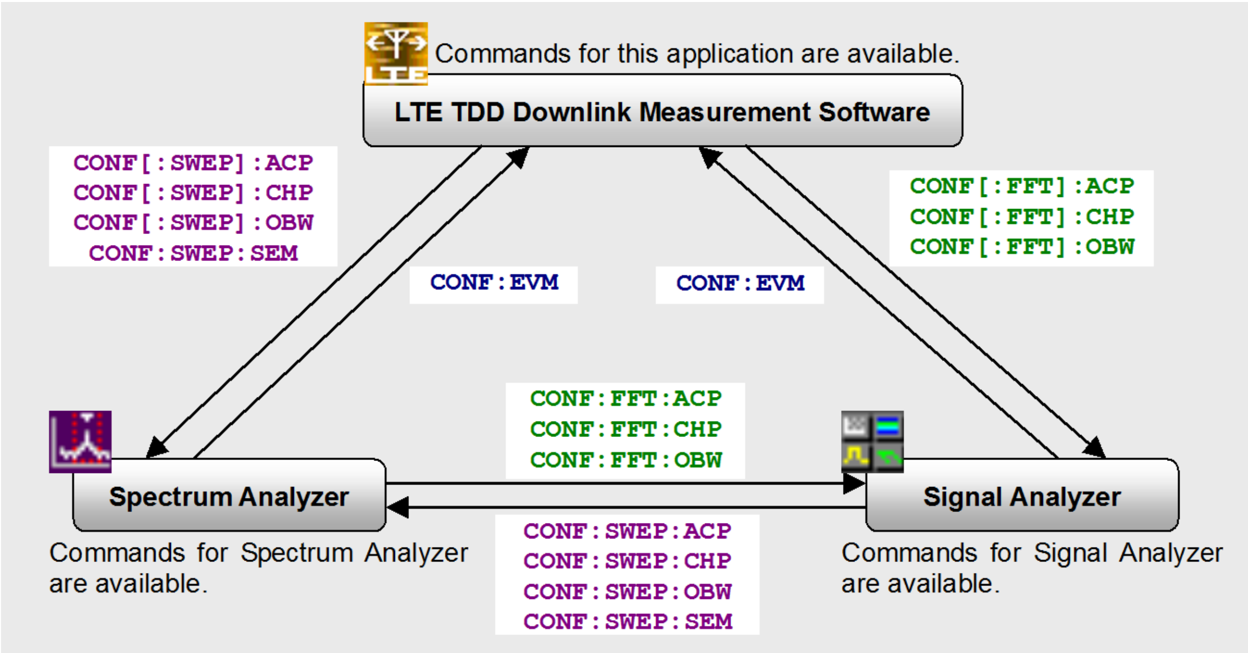


**Figure 1.2.11-1 Switching of Measurement Functions among Applications**

Figure 1.2.11-1 shows the measurement functions offered by each application and the switching commands. For example, you need to program `CONF:SWEP:ACP`, in order to invoke the ACP measurement function of Spectrum Analyzer from this application. You can write `CONF:ACP` without writing `SWEP` since it is set to use Spectrum Analyzer for the ACP measurement function if `ACP:INST SWEP` is transmitted in advance. `CONF[:SWEP]:<measure>` in Figure 1.2. 11-1 means that `SWEP` can be omitted if `<measure>:INST SWEP` is transmitted in advance.

If you switch the measurement function from Spectrum Analyzer to Signal Analyzer, or in the opposite way, you need to program `CONF:FFT:<measure>` or `CONF:SWEP:<measure>`. If `FFT` or `SWEP` is omitted, the measurement function will be selected by the presently selected application.

## 1.3 How to use the Native Mode

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

(1) SCPI Mode

Processes commands conforming to the grammar/document format defined in SCPI (ver1999.0)). In the SCPI mode, 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 `SYST:LANG SCPI`.

(2) Native Mode

Processes commands that are in this instrument's own definition type. Unless otherwise specified, the character string of the command header is fix. If a command of the application is only defined by SCPI mode, the character string converted by the conversion rule will be the command in the Native mode. For programming, you cannot use the grammar of SCPI mode, such as character string in long/short form format and cannot omit any angled bracket ( [ ] ) definition character strings.

***Note:***

The `STATus:QUEStionable` register command and `STATus:OPERation` command cannot be used in the Native mode, even if they are converted following the conversion rule described below.

The Native mode is automatically set after transmitting command `SYST:LANG NAT`.

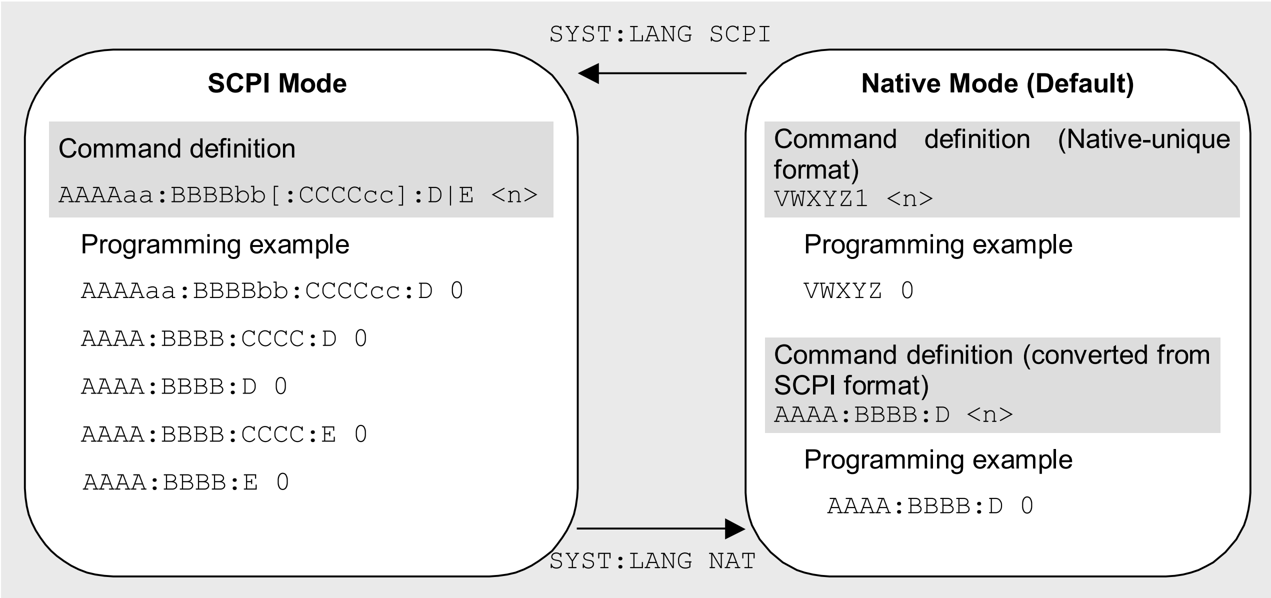


**Figure 1.3-1 SCPI mode and Native mode**

This application is only defined as the commands of the SCPI mode. You need to follow the conversion rule below in order to control this application by using the Native mode.

Conversion rule

1. Delete the numeric parameter in the program header of an SCPI mode, and describe the argument corresponding to the numeric parameter as the first argument. If the argument can have only one numeric value and the argument can be omitted, omit it. Describe the argument if it cannot be omitted.
2. Use the first one if multiple nodes can be selected.
3. Delete those layers which can be deleted.
4. Alter all long forms into short forms.
5. Delete the colon mark (":") at the head.

Example 1

Convert :CALCulate:MARKer[1]|2[:SET]:CENTer
into a Native mode.

1. Put a numeric parameter of the program header at the head of the argument.
   :CALCulate:MARKer**[1]|2**[:SET]:CENTer
   ↓
   :CALCulate:MARKer[:SET]:CENTer **<integer>**
   (the argument <integer> represents the numeric value 1 or 2)
2. Delete the layers that can be deleted.
   :CALCulate:MARKer**[:SET]**:CENTer <integer>
   ↓
   :CALCulate:MARKer:CENTer <integer>
3. Alter all long forms into short forms.
   :**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

Convert [:SENSe]:BPOWer|:TXPower[:STATe]?
into a Native mode.

1. Use the leading one if multiple nodes can be selected.
   [:SENSe]**:BPOWer|:TXPower**[:STATe]?
   ↓
   [:SENSe]**:BPOWer**[:STATe]?
2. Delete the layers that can be deleted.
   **[:SENSe]**:BPOWer**[:STATe]**?
   ↓
   :BPOWer?
3. Alter all long forms into short forms.
   :**BPOWer**?
   ↓
   :**BPOW**?
4. Delete the colon mark (":") at the head.
   **:**BPOW?
   ↓
   BPOW?

Example 3

:Convert FETCh|:EVM[n]? into a Native mode command.

1. Put a numeric parameter of the program header at the head of the argument.
   :FETCh:EVM**[n]**?
   ↓
   :FETCh:EVM? <integer>
2. Alter all the long forms into the short ones.
   :**FETCh:EVM?** <integer>
   ↓
   :**FETC:EVM?** <integer>
3. Omit the colon (":") at the head of the command.
   **:**FETCh:EVM? <integer>
   ↓
   FETC:EVM? <integer>
4. Set the value of arguments.
   FETCh:EVM? <integer>
   ↓
   FETC:EVM? 1

# 1.4 Character Programs Available for Setting Numeric Program Data

The following character programs can be used for setting numeric program data (numeric parameter) and is applicable only when using the SCPI mode.

(1) `DEFault`

When `DEFault` is specified for numeric program data, the initial value is set for the target parameter.

(2) `MINimum`

When `MINimum` is specified for numeric program data, the minimum value is set for the target parameter.

(3) `MAXimum`

When `MAXimum` is specified for numeric program data, the maximum value is set for the target parameter.

In this application, `DEFault`, `MINimum`, and `MAXimum` can be used for the following parameters.

`<freq>`

`<real>`

`<rel_power>`

`<integer>`

`<time>`

# Chapter 2 SCPI Device Message Details

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

# 2.1 Selecting Application

Table 2.1-1 lists the device messages used for setup applications, such as activation, selection, and initialization of the application.

**Table 2.1-1 Device Messages for Selecting Application**

| Function | Device Message |
|---|---|
| Load Application | `:SYSTem:APPLication:LOAD LTETDDDL` |
| Unload Application | `:SYSTem:APPLication:UNLoad LTETDDDL` |
| Application Switch | `:INSTrument[:SELect] LTETDDDL |CONFIG` |
| | `:INSTrument[:SELect]?` |
| Application Status | `:INSTrument:SYSTem LTETDDDL, [ACTive]|INACtive|MINimum` |
| | `:INSTrument:SYSTem? LTETDDDL` |
| Initialization | `:INSTrument:DEFault` |
| | `:SYSTem:PRESet` |

### 2.1.1 Loading application

## :SYSTem:APPLication:LOAD LTETDDDL

Load Application

Function

This command loads this application.

Command

```
:SYSTem:APPLication:LOAD LTETDDDL
```

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 LTETDDDL
```

## :SYSTem:APPLication:UNLoad LTETDDDL

Unload Application

Function

This command exits this application.

Command

```
:SYSTem:APPLication:UNLoad LTETDDDL
```

Details

This function exits the application being loaded, and removes it from the Application Switch menu.

This function is available when the control-targeted application is Config.

Example of Use

To exit this application.

```
SYST:APPL:UNL LTETDDDL
```

### 2.1.2 Selecting application

:INSTrument[:SELect] LTETDDDL|CONFIG

Application Switch

Function

This command selects the application to be controlled.

Command

```
:INSTrument[:SELect] <apl_name>
```

Parameter

| | |
|---|---|
| <apl_name> | Application name |
| LTETDDDL | This application |
| CONFIG | Config |

Details

Use the following commands for selecting a measurement function of the Signal Analyzer or Spectrum Analyzer from this application.

```
:CONFigure[:FFT|SWEPt]:ACP
:CONFigure[:FFT|SWEPt]:CHPower
:CONFigure[:FFT|SWEPt]:OBWidth
:CONFigureSWEPt:SEMask
```

Example of Use

To switch the control target to this application.

```
INST LTETDDDL
```

## :INSTrument[:SELect]?

Application Switch Query

### Function

This command queries the application being controlled currently.

### Query

```
:INSTrument[:SELect]?
```

### Response

```
<apl_name>
```

### Parameter

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

### Details

`LTETDDDL` is returned when a measurement function of this application is selected.

`SIGANA` or `SPECT` is returned when a measurement function such as ACP, Channel Power, OBW, and SEM of the Signal Analyzer or Spectrum Analyzer is selected.

### Example of Use

To query the application being controlled.

```
INST?
> LTETDDDL
```

## :INSTrument:SYSTem LTETDDDL,[ACTive]|INACtive|MINimum

Application Switch And Window Status

### Function

This command selects the window status of this application.

### Command

```
:INSTrument:SYSTem LTETDDDL,<window>
```

### Parameter

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

### Example of Use

To set the window status of this application to be active.

```
INST:SYST LTETDDDL,ACT
```

## :INSTrument:SYSTem? LTETDDDL

Application Switch And Window Status Query

### Function

This command queries the window status of this application.

### Query

`:INSTrument:SYSTem? LTETDDDL`

### Response

`<status>,<window>`

### Parameter

| | |
|---|---|
| `<status>` | Application status |
| `CURR` | Activated and controlled |
| `RUN` | Activated but not controlled |
| `IDLE` | Loaded but not activated |
| `UNL` | Unloaded |

| | |
|---|---|
| `<window>` | Window status |
| `ACT` | Active |
| `INAC` | Inactive |
| `MIN` | Minimized |
| `NON` | Not displayed |

### Example of Use

To query the window status of this application.

```
INST:SYST? LTETDDDL
> CURR,ACT
```

### 2.1.3 Initialization

#### :INSTrument:DEFault

Preset Current Application

Function

This command initializes the settings and status of the currently selected application.

Command

```
:INSTrument:DEFault
```

Details

After transmitting `:INST:DEF` by this application, the parameters of the Signal Analyzer or Spectrum Analyzer can also be initialized by selecting the ACP, Channel Power, OBW, or SEM measurement function with the following commands.

```
:CONFigure[:FFT|SWEPt]:ACP
:CONFigure[:FFT|SWEPt]:CHPower
:CONFigure[:FFT|SWEPt]:OBWidth
:CONFigure:SWEPt:SEMask
```

Example of Use

To initialize the settings and status of the currently selected application.

```
INST:DEF
```

#### :SYSTem:PRESet

Preset Current Application

Function

This command initializes the settings and status of the currently selected application.

See the description of `:INSTrument:DEFault`.

Example of Use

To initialize the settings and status of the currently selected application.

```
SYST:PRES
```

# 2.2 Setting Basic Parameters

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

**Table 2.2-1 Device Messages for Setting Basic Parameters**

| Parameter | Device Message |
|---|---|
| Carrier Frequency | [:SENSe]:FREQuency:CENTer <freq> |
| | [:SENSe]:FREQuency:CENTer? |
| Input Level | [:SENSe]:POWer[:RF]:RANGe:ILEVel <real> |
| | [:SENSe]:POWer[:RF]:RANGe:ILEVel? |
| Reference Level (Remote only) | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real> |
| | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel? |
| Level Offset | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power> |
| | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet? |
| Level Offset State | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF\|ON\|0\|1 |
| | :DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe? |
| Pre-Amp State | [:SENSe]:POWer[:RF]:GAIN[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:POWer[:RF]:GAIN[:STATe]? |
| Auto Range | [:SENSe]:POWer[:RF]:RANGe:AUTO ONCE |

### 2.2.1 Carrier Frequency

[:SENSe]:FREQuency:CENTer <freq>

Carrier Frequency

Function

This command sets the carrier frequency for the signal to be measured.

Command

```
[:SENSe]:FREQuency:CENTer <freq>
```

Parameter

| | |
|---|---|
| `<freq>` | Carrier frequency |
| Range | 100 MHz to the upper limit of the main unit |
| Resolution | 1 Hz |
| Suffix code | `HZ`, `KHZ`, `KZ`, `MHZ`, `MZ`, `GHZ`, `GZ`<br>Hz is used when omitted. |
| Default value | 2110 MHz |

Details

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

Example of Use

To set the carrier frequency to 1.000 GHz.

```
FREQ:CENT 1.000GHZ
```

## [:SENSe]:FREQuency:CENTer?

Carrier Frequency Query

### Function

This command queries the carrier frequency of the measured signal.

### Query

```
[:SENSe]:FREQuency:CENTer?
```

### Response

```
<freq>
```

### Parameter

| | |
|---|---|
| `<freq>` | Carrier frequency |
| Range | 100 MHz to the upper limit of the main unit |
| Resolution | 1 Hz |
| | Value is returned in Hz units. |

### Example of Use

To query the carrier frequency.

```
FREQ:CENT?
> 1000000000
```

### 2.2.2 Input Level

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

Input Level

Function

This command sets the input level of RF signals.

Command

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

Parameter

| | |
|---|---|
| `<real>` | Input level |
| Range | (–60.00 + level offset) to (30.00 + level offset) dBm (Pre-Amp Off)<br>(–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp On) , or when Pre-Amp Mode is On at Power vs Time measurement |
| Resolution | 0.01 dB |
| Unit | dBm |
| Suffix code | DBM<br>dBm is used when omitted. |
| Default value | –10.00 dBm |

Details

The setting range when Pre Amp is Off is applied if the MS2690A/MS2691A/MS2692A Option 008 6 GHz Preamplifier or MS2830A Option 008/208 Preamplifier (hereinafter referred to as “Option 008”) is not installed.

Details

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

Example of Use

To set the input level to 0 dBm.

```
:POW:RANG:ILEV 0
```

## [:SENSe]:POWer[:RF]:RANGe:ILEVel?

Input Level Query

### Function

This command queries the input level of RF signals.

### Query

`[:SENSe]:POWer[:RF]:RANGe:ILEVel?`

### Response

`<real>`

### Parameter

`<real>` Input level

Range (–60.00 + level offset) to (30.00 + level offset) dBm (Pre-Amp Off)
(–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp On) or when Pre-Amp Mode is On at Power vs Time measurement

Resolution 0.01 dB
Value is returned in dBm units.

### Example of Use

To query the input level.

```
POW:RANG:ILEV?
> 0.00
```

### 2.2.3 Reference Level

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

Reference Level

Function

This command sets the reference level for the ACP, Channel Power, OBW, and SEM measurements.

Command

```
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real>
```

Parameter

| | |
|---|---|
| `<real>` | Reference level |
| Range | (Minimum input level + 14) to (Maximum input level + 14) dBm |
| Resolution | 0.01 dB |
| Suffix code | DBM<br>dBm is used when omitted. |
| Default value | 4.00 dBm |

Details

The reference level indicates the peak level of the input signal and is automatically calculated for the input level. This is an internal parameter and is not displayed on the screen. When the ACP, Channel Power, OBW, or SEM measurement function is called, the reference level is applied to that measurement function. The input level is also changed when the reference level is changed.

Details

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

Example of Use

To set the reference level to 0.00 dBm.

```
DISP:WIND:TRAC:Y:RLEV 0.00DBM
```

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

Reference Level Query

### Function

This command queries the reference level of the ACP, Channel Power, OBW, and SEM measurements.

### Query

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

### Response

```
<real>
```

### Parameter

| | |
|---|---|
| <real> | Reference level |
| Range | (Minimum input level + 14) to (Maximum input level + 14) dBm |
| Resolution | 0.01 dB |
| | Value is returned in dBm units. |

### Example of Use

To query the reference level.

```
DISP:WIND:TRAC:Y:RLEV?
> 0.00
```

### 2.2.4 Level Offset

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

Level Offset Value

Function

This command sets the offset value for 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<br>dB is used when omitted. |
| Default value | 0 dB |

Example of Use

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

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

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

Level Offset Value Query

Function

This command queries 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 query 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 input level offset function.

Command

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

Parameter

| | |
|---|---|
| `<switch>` | Enables/disables input level offset function |
| `OFF|0` | Disables the input level offset function (Default). |
| `ON|1` | Enables the input level offset function. |

Example of Use

To enable the input level offset function.

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

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

Level Offset State Query

Function

This command queries whether the input level offset function is enabled.

Query

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

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Enables/disables input level offset function |
| `0` | The input level offset function is disabled. |
| `1` | The input level offset function is enabled. |

Example of Use

To query whether the input level offset function is enabled.

```
DISP:WIND:TRAC:Y:RLEV:OFFS:STAT?
> 1
```

## 2.2.6 Pre Amp

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

Pre Amp State

Function

This command sets Pre-amp 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 not available in the following situations:

When Option 008 is not installed.

Details

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

When Wide Dynamic Range is set to On at the Power vs Time measurement, Pre-Amp is set to Off and this command is invalid.

Example of Use

To set Pre-amp On.

```
POW:GAIN ON
```

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

Pre Amp State Query

Function

This command queries the Pre-amp On/Off state.

Query

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

Response

`<switch>`

Parameter

| | |
|---|---|
| `<switch>` | Pre-amp On/Off |
| `0` | Off |
| `1` | On |

Details

When Option 006 is not installed, `0` (Pre-amp Off) is returned.

Example of Use

To query the Pre-amp On/Off state.

```
POW:GAIN?
> 1
```

# 2.2.7 Auto Range

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

Auto Range

Function

This command executes Auto Range and adjust input level.

Command

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

Details

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

This command is not available when Limiter Mode is On.

Example of Use

To execute Auto Range.

```
POW:RANG:AUTO ONCE
```

# 2.3 Setting System Parameters

Table 2.3-1 lists the device messages used for the communication system targeted for measurement.

**Table 2.3-1 Device Messages for Setting System Parameters**

| Parameter | Device Message |
|---|---|
| Channel Bandwidth | [:SENSe]:RADio:CBANdwidth 20\|15\|10\|5\|3\|1M4 |
| | [:SENSe]:RADio:CBANdwidth? |
| Test Model | [:SENSe]:RADio:TMODel OFF\|TM1_1\|TM1_2\|TM2\|TM3_1\|TM3_2\|TM3_3 |
| | [:SENSe]:RADio:TMODel? |
| Test Model Version | [:SENSe]:RADio:TMODel:VERSion V820\|V830 |
| | [:SENSe]:RADio:TMODel:VERSion? |
| Test Model Starting Frame Type | [:SENSe]:EVM:TMODel:SFTYpe UNLock\|FRAMe1\|FRAMe2 |
| | [:SENSe]:EVM:TMODel:SFTYpe? |
| Uplink-downlink Configuration | [:SENSe]:RADio:UDConfiguration <integer> |
| | [:SENSe]:RADio:UDConfiguration? |
| Special Subframe Configuration | [:SENSe]:RADio:SSConfiguration <integer> |
| | [:SENSe]:RADio:SSConfiguration? |
| Synchronization Mode | [:SENSe]:RADio:SYNChronization:MODE RS\|SS |
| | [:SENSe]:RADio:SYNChronization:MODE? |
| Reference Signal | :CALCulate:EVM:RSIGnal:CELLid <integer> |
| | :CALCulate:EVM:RSIGnal:CELLid? |
| | :CALCulate:EVM:RSIGnal:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:RSIGnal:POWer:BOOSting? |
| | :CALCulate:EVM:ANTenna:Number 1\|2\|4 |
| | :CALCulate:EVM:ANTenna:Number? |
| | :CALCulate:EVM:APORt <integer> |
| | :CALCulate:EVM:APORt? |
| Starting Subframe Number | [:SENSe]:EVM:CAPTure:TIME:STARt <integer> |
| | [:SENSe]:EVM:CAPTure:TIME:STARt? |
| Measurement Interval | [:SENSe]:EVM:CAPTure:TIME:LENGth <integer> |
| | [:SENSe]:EVM:CAPTure:TIME:LENGth? |

**Table 2.3-1 Device Messages for Setting System Parameters (Cont'd)**

| Parameter | Device Message |
|---|---|
| Analysis Frame Position | [:SENSe]:EVM:CAPTure:TIME:FPOSition <integer> |
| | [:SENSe]:EVM:CAPTure:TIME:FPOSition? |
| Analysis Offset Time | [:SENSe]:EVM:CAPTure:TIME:OFFSet <integer> |
| | [:SENSe]:EVM:CAPTure:TIME:OFFSet? |
| PDSCH Modulation Scheme | :CALCulate:EVM:PDSCh:MODulation QPSK\|16Qam\|64Qam\|256Qam\|AUTO |
| | :CALCulate:EVM:PDSCh:MODulation? |
| EVM Window Length | :CALCulate:EVM:WLENgth <integer> |
| | :CALCulate:EVM:WLENgth? |
| | :CALCulate:EVM:WLENgth:W <integer> |
| | :CALCulate:EVM:WLENgth:W? |
| | :CALCulate:EVM:WLENgth:TYPE TS\|W |
| | :CALCulate:EVM:WLENgth:TYPE? |
| Channel Estimation | :CALCulate:EVM:CHANnel:ESTimation OFF\|ON\|0\|1 |
| | :CALCulate:EVM:CHANnel:ESTimation? |
| DwPTS | :CALCulate:EVM:DWPTs INCLude\|EXCLude |
| | :CALCulate:EVM:DWPTs? |
| Measurement Filter Type | :CALCulate:EVM:MFILter NORMal\|NARRow |
| | :CALCulate:EVM:MFILter? |
| Extended Freq Lock Range | [:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe OFF\|ON\|0\|1 |
| | [:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe? |
| PBCH On/Off | :CALCulate:EVM:PBCH[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PBCH[:STATe]? |
| PBCH Power Auto | :CALCulate:EVM:PBCH:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PBCH:POWer:AUTO? |
| PBCH Power Boosting | :CALCulate:EVM:PBCH:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PBCH:POWer:BOOSting? |
| P-SS On/Off | :CALCulate:EVM:PSS[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PSS[:STATe]? |
| P-SS Power Auto | :CALCulate:EVM:PSS:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PSS:POWer:AUTO? |
| P-SS Power Boosting | :CALCulate:EVM:PSS:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PSS:POWer:BOOSting? |

Table 2.3-1 Device Messages for Setting System Parameters (Cont'd)

| Parameter | Device Message |
|---|---|
| S-SS On/Off | :CALCulate:EVM:SSS[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:SSS[:STATe]? |
| S-SS Power Auto | :CALCulate:EVM:SSS:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:SSS:POWer:AUTO? |
| S-SS Power Boosting | :CALCulate:EVM:SSS:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:SSS:POWer:BOOSting? |
| PDCCH On/Off | :CALCulate:EVM:PDCCh[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PDCCh[:STATe]? |
| PDCCH Power Auto | :CALCulate:EVM:PDCCh:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PDCCh:POWer:AUTO? |
| PDCCH Power Boosting | :CALCulate:EVM:PDCCh:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PDCCh:POWer:BOOSting? |
| Number of PDCCH Symbols | :CALCulate:EVM:PDCCh:SYMBol:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PDCCh:SYMBol:AUTO? |
| | :CALCulate:EVM:PDCCh:SYMBol:SFRame1\|6:NUMBer <integer> |
| | :CALCulate:EVM:PDCCh:SYMBol:SFRame1\|6:NUMBer? |
| | :CALCulate:EVM:PDCCh:SYMBol:NUMBer <integer> |
| | :CALCulate:EVM:PDCCh:SYMBol:NUMBer? |
| PDCCH Mapping | :CALCulate:EVM:PDCCh:MAPPing AUTO\|EASY |
| | :CALCulate:EVM:PDCCh:MAPPing? |
| PDCCH Format | :CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat 0\|1\|2\|3 |
| | :CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat? |
| Number of PDCCHs | :CALCulate:EVM:PDCCh:MAPPing[:EASY]:NUMBer <integer> |
| | :CALCulate:EVM:PDCCh:MAPPing[:EASY]:NUMBer? |
| PCFICH On/Off | :CALCulate:EVM:PCFich[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PCFich[:STATe]? |
| PCFICH Power Auto | :CALCulate:EVM:PCFich:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PCFich:POWer:AUTO? |
| PCFICH Power Boosting | :CALCulate:EVM:PCFich:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PCFich:POWer:BOOSting? |
| PHICH On/Off | :CALCulate:EVM:PHICh[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PHICh[:STATe]? |
| PHICH Power Auto | :CALCulate:EVM:PHICh:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PHICh:POWer:AUTO? |

Table 2.3-1 Device Messages for Setting System Parameters (Cont'd)

| Parameter | Device Message |
|---|---|
| PHICH Power Boosting | :CALCulate:EVM:PHICh:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PHICh:POWer:BOOSting? |
| PHICH Ng | :CALCulate:EVM:PHICh:NG R1BY6\|R1BY2\|R1\|R2 |
| | :CALCulate:EVM:PHICh:NG? |
| PHICH Duration | :CALCulate:EVM:PHICh:DURation NORMal\|EXTended |
| | :CALCulate:EVM:PHICh:DURation? |
| PDSCH Power Auto | :CALCulate:EVM:PDSCh:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:EVM:PDSCh:POWer:AUTO? |
| PDSCH Power Boosting | :CALCulate:EVM:PDSCh:POWer:BOOSting <rel_power> |
| | :CALCulate:EVM:PDSCh:POWer:BOOSting? |
| PDSCH EVM Calculation | :CALCulate:EVM:PDSCh:MODE 3GPP\|APRE |
| | :CALCulate:EVM:PDSCh:MODE? |
| Total EVM & Constellation Composite | :CALCulate:EVM:TEVM:RS INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:RS? |
| | :CALCulate:EVM:TEVM:PDSCh INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PDSCh? |
| | :CALCulate:EVM:TEVM:PBCH INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PBCH? |
| | :CALCulate:EVM:TEVM:PSS INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PSS? |
| | :CALCulate:EVM:TEVM:SSS INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:SSS? |
| | :CALCulate:EVM:TEVM:PDCCh INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PDCCh? |
| | :CALCulate:EVM:TEVM:PCFich INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PCFich? |
| | :CALCulate:EVM:TEVM:PHICh INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:PHICh? |
| | :CALCulate:EVM:TEVM:DTX INCLude\|EXCLude |
| | :CALCulate:EVM:TEVM:DTX? |

## 2.3.1 Channel Bandwidth

### [:SENSe]:RADio:CBANdwidth 20|15|10|5|3|1M4

Channel Bandwidth

**Function**

This command sets the bandwidth for the signal to be measured.

**Command**

```
[:SENSe]:RADio:CBANdwidth <mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Bandwidth for signal to be measured |
| `20` | Sets a 20 MHz bandwidth signal for analysis. |
| `15` | Sets a 15 MHz bandwidth signal for analysis. |
| `10` | Sets a 10 MHz bandwidth signal for analysis. |
| `5` | Sets a 5 MHz bandwidth signal for analysis (Default). |
| `3` | Sets a 3 MHz bandwidth signal for analysis. |
| `1M4` | Sets a 1.4 MHz bandwidth signal for analysis. |

**Example of Use**

To set the bandwidth of the signal to be measured to 5 MHz.

```
RAD:CBAN 5
```

### [:SENSe]:RADio:CBANdwidth?

Channel Bandwidth Query

**Function**

This command queries the bandwidth of the measured signal.

**Query**

```
[:SENSe]:RADio:CBANdwidth?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Bandwidth of measured signal |
| `20` | A 20 MHz bandwidth signal is set for analysis. |
| `15` | A 15 MHz bandwidth signal is set for analysis. |
| `10` | A 10 MHz bandwidth signal is set for analysis. |
| `5` | A 5 MHz bandwidth signal is set for analysis. |
| `3` | A 3 MHz bandwidth signal is set for analysis. |
| `1M4` | A 1.4 MHz bandwidth signal is set for analysis. |

**Example of Use**

To query the bandwidth of the measured signal.

```
RAD:CBAN?
> 5
```

## 2.3.2 Test Model

### [:SENSe]:RADio:TMODel OFF|TM1_1|TM1_2|TM2|TM2A|TM3_1|TM3_1A|TM3_2|TM3_3

Test Model

**Function**

This command sets the type of a test model.

**Command**

```
[:SENSe]:RADio:TMODel <mode>
```

**Parameter**

| <mode> | Test model |
|---|---|
| OFF | None (Default) |
| TM1_1 | E-TM 1.1 |
| TM1_2 | E-TM 1.2 |
| TM2 | E-TM 2 |
| TM2A | E-TM 2a |
| TM3_1 | E-TM 3.1 |
| TM3_1A | E-TM 3.1a |
| TM3_2 | E-TM 3.2 |
| TM3_3 | E-TM 3.3 |

**Example of Use**

To set E-TM1.1 as the test model.

```
RAD:TMOD TM1_1
```

## [:SENSe]:RADio:TMODel?

Test Mode Query

**Function**

This command queries the type of a test model.

**Query**

```
[:SENSe]:RADio:TMODel
```

**Response**

```
<mode>
```

**Parameter**

| <mode> | Test model |
|---|---|
| OFF | None |
| TM1_1 | E-TM 1.1 |
| TM1_2 | E-TM 1.2 |
| TM2 | E-TM 2 |
| TM2A | E-TM 2a |
| TM3_1 | E-TM 3.1 |
| TM3_1A | E-TM 3.1a |
| TM3_2 | E-TM 3.2 |
| TM3_3 | E-TM 3.3 |

**Example of Use**

To query the type of a test model.

```
RAD:TMOD?
> TM1_1
```

## 2.3.3 Test Model Version

### [:SENSe]:RADio:TMODel:VERSion V820|V830

Test Model Version

Function

This command specifies the version of 3GPP TS36. 141, that defines the test model signal.

Command

`[:SENSe]:RADio:TMODel:VERSion V820|V830`

Parameter

| | |
|---|---|
| `<mode>` | TestModel Version |
| `V820` | 3GPP TS36.141 v8.2.0 (2009-03) |
| `V830` | 3GPP TS36.141 v8.3.0 (2009-05) (Default) |

Example of Use

To set the version of the test model to v8.3.0.

```
RAD:TMOD:VERS V830
```

### [:SENSe]:RADio:TMODel:VERSion?

Test Model Version Query

Function

This command queries the version of 3GPP TS36. 141, that defines the test model signal.

Query

`[:SENSe]:RADio:TMODel:VERSion?`

Response

`<mode>`

Parameter

| | |
|---|---|
| `<mode>` | TestModel Version |
| `V820` | 3GPP TS36.141 v8.2.0(2009-03) |
| `V830` | 3GPP TS36.141 v8.3.0(2009-05) |

Example of Use

To query the test model version.

```
RAD:TMOD:VERS?
> V830
```

## 2.3.4 Test Model Starting Frame Type

### [:SENSe]:EVM:TMODel:SFTYpe UNLock|FRAMe1|FRAMe2

Test Model Starting Frame Type

Function

This command sets the Frame Offset0 measurement target when measuring the Test Model signal (E-TM1.2, 2, 2a, 3.2, 3.3).

Command

```
[:SENSe]:EVM:TMODel:SFTYpe UNLock|FRAMe1|FRAMe2
```

Parameter

| | |
|---|---|
| <mode> | Starting Frame Type |
| UNLock | No specified target |
| FRAMe1 | Specifies frame1 |
| FRAMe2 | Specifies frame2 |

Example of Use

To set Frame Offset0 measurement target to frame2.

```
EVM:TMOD:SFTY FRAM2
```

### [:SENSe]:EVM:TMODel:SFTYpe?

Test Model Starting frame type Query

Function

This command queries the Frame Offset0 measurement target when measuring the Test Model signal (E-TM1.2, 2, 2a, 3.2, 3.3).

Command

```
[:SENSe]:EVM:TMODel:SFTYpe?
```

Response

<mode>

Parameter

| | |
|---|---|
| <mode> | Starting Frame Type |
| UNL | Frame Offset0 measurement target not specified |
| FRAM1 | frame1 specified as Frame Offset0 measurement target |
| FRAM2 | frame2 specified as Frame Offset0 measurement target |

Example of Use

To query the Frame Offset0 measurement target.

```
EVM:TMOD:SFTY?
>FRAM2
```

2

SCPI Device Message Details

## 2.3.5 Uplink-downlink Configuration

### [:SENSe]:RADio:UDConfiguration <integer>

Uplink-downlink Configuration

Function

This command sets the Uplink-downlink Configuration.

Command

```
[:SENSe]:RADio:UDConfiguration <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Uplink-downlink Configuration |
| Range | 0 to 6 |
| Resolution | 1 |
| Suffix code | None |
| Default | 3 |

Details

Available when Test Model is set to Off.

Example of Use

To set Uplink-downlink Configuration to 2.

```
RAD:UDC 2
```

### [:SENSe]:RADio:UDConfiguration?

Uplink-downlink Configuration Query

Function

This command queries the Uplink-downlink Configuration.

Query

```
[:SENSe]:RADio:UDConfiguration?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Uplink-downlink Configuration |
| Range | 0 to 6 |
| Resolution | 1 |

Example of Use

To query the Uplink-downlink Configuration.

```
RAD:UDC?
> 2
```

### 2.3.6 Special Subframe Configuration

## [:SENSe]:RADio:SSConfiguration <integer>

Special Subframe Configuration

Function

This command sets the Special Subframe Configuration.

Command

```
[:SENSe]:RADio:SSConfiguration <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Special Subframe Configuration |
| Range | 0 to 8 |
| Resolution | 1 |
| Suffix code | None |
| Default | 8 |

Details

Available when Test Model is set to Off.

Example of Use

To set Special Subframe Configuration to 2.

```
RAD:SSC 2
```

## [:SENSe]:RADio:SSConfiguration?

Special Subframe Configuration Query

Function

This command queries the Special Subframe Configuration.

Query

```
[:SENSe]:RADio:SSConfiguration?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Special Subframe Configuration |
| Range | 0 to 8 |
| Resolution | 1 |

Example of Use

To query Special Subframe Configuration.

```
RAD:SSC?
> 2
```

### 2.3.7 Synchronization Mode

#### [:SENSe]:RADio:SYNChronization:MODE RS|SS

Synchronization Mode

**Function**

This command sets the synchronizing signal.

**Command**

`[:SENSe]:RADio:SYNChronization:MODE <mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | Synchronizing signal |
| `RS` | Sets Reference Signal for the synchronizing signal. |
| `SS` | Sets Synchronization Signal for the synchronizing signal (Default). |

**Details**

This command is available when Test Mode is set to Off.

**Example of Use**

To set Reference Signal to the synchronizing signal.

`RAD:SYNC:MODE RS`

## [:SENSe]:RADio:SYNChronization:MODE?

Synchronization Mode Query

### Function

This command queries the synchronized signal.

### Query

```
[:SENSe]:RADio:SYNChronization:MODE?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| <mode> | Synchronizing signal |
| RS | Sets Reference Signal for the synchronizing signal. |
| SS | Sets Synchronization Signal for the synchronizing signal. |

### Example of Use

To query the synchronizing signal

```
RAD:SYNC:MODE?
> RS
```

## 2.3.8 Reference Signal

### :CALCulate:EVM:RSIGnal:CELLid <integer>

Reference Signal Cell ID

**Function**

This command sets the Cell ID.

**Command**

```
:CALCulate:EVM:RSIGnal:CELLid <integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Cell ID |
| Range | 0 to 503 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

**Details**

This command is available when Test Model is set to Off and also when Reference Signal is selected for the Synchronization Mode.

**Example of Use**

To set the Cell ID to 2.

```
CALC:EVM:RSIG:CELL 2
```

### :CALCulate:EVM:RSIGnal:CELLid?

Reference Signal Cell ID Query

**Function**

This command queries the Cell ID.

**Query**

```
:CALCulate:EVM:RSIGnal:CELLid?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Cell ID |
| Range | 0 to 503 |
| Resolution | 1 |

**Example of Use**

To query the Cell ID.

```
CALC:EVM:RSIG:CELL?
> 2
```

## :CALCulate:EVM:RSIGnal:POWer:BOOSting <rel_power>

Reference Signal Power Boosting

### Function

This command sets the boost level for the reference signal.

### Command

```
:CALCulate:EVM:RSIGnal:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Boost level of the reference signal |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0 dB |

### Details

This command is available when Test Mode is set to Off.

### Example of Use

To set the boost level of the reference signal to +10 dB.

```
CALC:EVM:RSIG:POW:BOOS 10
```

## :CALCulate:EVM:RSIGnal:POWer:BOOSting?

Reference Signal Power Boosting Query

Function

This command queries the boost level of the reference signal.

Query

```
:CALCulate:EVM:RSIGnal:POWer:BOOSting?
```

Response

```
<rel_power>
```

Parameter

| | |
|---|---|
| `<rel_power>` | Boost level of the reference signal |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

Details

This command is available when Test Mode is set to Off.

Example of Use

To query the boost level of the reference signal.

```
CALC:EVM:RSIG:POW:BOOS?
> 10.000
```

## :CALCulate:EVM:ANTenna:NUMBer 1|2|4

Reference Signal Number of Antenna Ports

Function

This command sets the number of antennas.

Command

```
:CALCulate:EVM:ANTenna:NUMBer <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Number of antennas |
| 1 | Uses 1 antenna for transmission. (Default) |
| 2 | Uses 2 antennas for transmission. |
| 4 | Uses 4 antennas for transmission. |

Details

This command is available when Test Mode is set to Off.

Example of Use

To set 2 for the number of antennas.

```
CALC:EVM:ANT:NUMB 2
```

## :CALCulate:EVM:ANTenna:NUMBer?

Reference Signal Number of Antenna Ports Query

**Function**

This command queries the number of antennas.

**Query**

```
:CALCulate:EVM:ANTenna:NUMBer?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Number of antennas |
| `1` | One antenna is used for transmission. |
| `2` | Two antennas are used for transmission. |
| `4` | Four antennas are used for transmission. |

**Example of Use**

To query the number of antennas.

```
CALC:EVM:ANT:NUMB?
> 2
```

## :CALCulate:EVM:APORt <integer>

Reference Signal Antenna Port

**Function**

This command sets the antenna to be measured.

**Command**

```
:CALCulate:EVM:APORt <integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Antenna to be measured |
| Range | 0 to (Number of Antenna Ports −1) |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

**Details**

This command is available when Test Mode is set to Off.

**Example of Use**

To set the antennas to be measured to 2.

```
CALC:EVM:APOR 2
```

## :CALCulate:EVM:APORt?

Reference Signal Antenna Port Query

### Function

This command queries the antenna to be measured.

### Query

```
:CALCulate:EVM:APORt?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Antenna to be measured |
| Range | 0 to (Number of Antenna Ports –1) |
| Resolution | 1 |

### Example of Use

To query the antenna to be measured.

```
CALC:EVM:APOR?
> 2
```

### 2.3.9 Starting Subframe Number

[:SENSe]:EVM:CAPTure:TIME:STARt <integer>

Analysis Time Starting Subframe Number

Function

This command sets the analysis start time.

Command

```
[:SENSe]:EVM:CAPTure:TIME:STARt <integer>
```

Parameter

`<integer>` Subframe number

Range

Uplink-downlink Configuration 0:
0, 5 + 10×N
Uplink-downlink Configuration 1:
0, 4, 5, 9 + 10×N
Uplink-downlink Configuration 2:
0, 3, 4, 5, 8, 9 + 10×N
Uplink-downlink Configuration 3:
0, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 4:
0, 4, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 5:
0, 3, 4, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 6:
0, 5, 9 + 10×N
Where N = 0 to 4

| | |
|---|---|
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Example of Use

To set the analysis start position to Subframe number 0.

```
EVM:CAPT:TIME:STAR 0
```

## [:SENSe]:EVM:CAPTure:TIME:STARt?

Analysis Time Starting Subframe Number Query

### Function

This command queries the analysis start time.

### Query

`[:SENSe]:EVM:CAPTure:TIME:STARt?`

### Response

`<integer>`

### Parameter

`<integer>` Subframe number

Range

Uplink-downlink Configuration 0:
0, 5 + 10×N
Uplink-downlink Configuration 1:
0, 4, 5, 9 + 10×N
Uplink-downlink Configuration 2:
0, 3, 4, 5, 8, 9 + 10×N
Uplink-downlink Configuration 3:
0, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 4:
0, 4, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 5:
0, 3, 4, 5, 6, 7, 8, 9 + 10×N
Uplink-downlink Configuration 6:
0, 5, 9 + 10×N
Where N = 0 to 4

Resolution 1

### Example of Use

To query the analysis start time.

```
EVM:CAPT:TIME:STAR?
> 0
```

## 2.3.10 Measurement Interval

### [:SENSe]:EVM:CAPTure:TIME:LENGth <integer>

Analysis Time Measurement Interval

Function

This command sets the analysis subframe length.

Command

```
[:SENSe]:EVM:CAPTure:TIME:LENGth <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Analysis subframe length |
| Range | 1 to (50 – Starting Subframe Number) |
| Resolution | 1 |
| Suffix code | None |
| Default value | 10 |

Example of Use

To set the analysis subframe length to 2.

```
EVM:CAPT:TIME:LENG 2
```

### [:SENSe]:EVM:CAPTure:TIME:LENGth?

Analysis Time Measurement Interval Query

Function

This command queries the analysis subframe length.

Query

```
[:SENSe]:EVM:CAPTure:TIME:LENGth?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Analysis subframe length |
| Range | 1 to (50 – Starting Subframe Number) |
| Resolution | 1 |

Example of Use

To query the analysis subframe length.

```
EVM:CAPT:TIME:LENG?
> 2
```

### 2.3.11 Analysis Frame Position

## [:SENSe]:EVM:CAPTure:TIME:FPOSition <integer>

Analysis Frame Position

Function

This command sets the analysis starting frame number.

Command

```
[:SENSe]:EVM:CAPTure:TIME:FPOSition <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Analysis starting frame number |
| Range | 0 to (Capture Time Length - Storage Count×5) |
| Resolution | 1 |
| Suffix code | None |
| Default | 0 |

Details

This setting is enabled when Capture Time Auto is set to Off.

The setting range differs depending on the values of Capture Time Length and Storage Count.

Example of Use

To set 2 for the analysis starting frame number.

```
EVM:CAPT:TIME:FPOS 2
```

## [:SENSe]:EVM:CAPTure:TIME:FPOSition?

Analysis Frame Position Query

Function

This command queries the analysis starting frame number.

Query

```
[:SENSe]:EVM:CAPTure:TIME:FPOSition?
```

Response

```
<integer>
```

Parameter

| | | |
|---|---|---|
| <integer> | | Analysis starting frame number |
| | Range | 0 to (Capture Time Length - Storage Count×5) |
| | Resolution | 1 |

Example of Use

To query the analysis starting frame number.

```
EVM:CAPT:TIME:FPOS?
> 2
```

## 2.3.12 Analysis Offset Time

### [:SENSe]:EVM:CAPTure:TIME:OFFSet <time>

Analysis Offset Time

#### Function

This command sets the position for starting analysis based on the offset from Analysis Frame Position.

#### Command

```
[:SENSe]:EVM:CAPTure:TIME:OFFSet <time>
```

#### Parameter

| | |
|---|---|
| `<time>` | Offset |
| Range | –4.999999 to +4.999999 ms |
| Resolution | 1 ns |
| Suffix code | `NS`, `US`, `MS`, `S`<br>Ns is used when the suffix code is omitted. |
| Default | 0 ns |

#### Details

This setting is enabled when Capture Time Auto is set to Off.

The setting range differs depending on the values of Capture Time Length, Storage Count, and Analysis Frame Position.

#### Example of Use

To set the offset of the analysis start position to 1 ms before.

```
EVM:CAPT:TIME:OFFS -1MS
```

## [:SENSe]:EVM:CAPTure:TIME:OFFSet?

Analysis Offset Time Query

### Function

This command queries the offset of the position for starting analysis.

### Query

```
[:SENSe]EVM:CAPTure:TIME:OFFSet?
```

### Response

```
<time>
```

### Parameter

| | |
|---|---|
| <time> | Offset |
| Range | –4.999999 to +4.999999 ms |
| Resolution | 1 ns<br>Value is returned in ns units. |

### Example of Use

To query the offset of the analysis start position.

```
EVM:CAPT:TIME:OFFS?
> -1000000
```

## 2.3.13 PDSCH Modulation Scheme

### :CALCulate:EVM:PDSCh:MODulation QPSK|16Qam|64Qam|AUTO

PDSCH Modulation Scheme

**Function**

This command sets the PDSCH modulation mode.

**Command**

```
:CALCulate:EVM:PDSCh:MODulation <mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Modulation mode |
| `QPSK` | Sets QPSK modulation mode for analysis. |
| `16Qam` | Sets 16QAM modulation mode for analysis. |
| `64Qam` | Sets 64QAM modulation mode for analysis. |
| `256Qam` | Sets 256QAM modulation mode for analysis. |
| `AUTO` | Analyzes an input signal after judging its modulation scheme automatically (Excluding 256QAM) (default). |

**Details**

This command is available when Test Mode is set to Off.

**Example of Use**

To set the PDSCH modulation mode to QPSK.

```
CALC:EVM:PDSC:MOD QPSK
```

## :CALCulate:EVM:PDSCh:MODulation?

PDSCH Modulation Scheme Query

**Function**

This command queries the PDSCH modulation mode.

**Query**

```
:CALCulate:EVM:PDSCh:MODulation?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Modulation mode |
| QPSK | QPSK modulation mode is set for analysis. |
| 16Q | 16QAM modulation mode is set for analysis. |
| 64Q | 64QAM modulation mode is set for analysis. |
| 256Q | 256QAM modulation mode is set for analysis. |
| AUTO | Analyzes an input signal after judging its modulation scheme automatically (Excluding 256QAM). |

**Example of Use**

To query the PDSCH modulation mode.

```
CALC:EVM:PDSC:MOD?
> QPSK
```

## 2.3.14 EVM Window Length

### :CALCulate:EVM:WLENgth <integer>

EVM Window Length

Function

This command sets the FFT window length.

Command

```
:CALCulate:EVM:WLENgth <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | FFT window length |
| Range | 0 to 142 Ts |
| Resolution | 1 Ts |
| Suffix code | None |
| Default value | 128 Ts |

Details

The value of EVM Window Length when changing Channel Bandwidth is set to the default value corresponding to the Channel Bandwidth value.

There is no correlation between the values set as Ts and W. The command `:CALCulate:EVM:WLENgth:TYPE` sets which of Ts or W to apply at measurement.

Example of Use

To set the FFT window length to 10.

```
CALC:EVM:WLEN 10
```

### :CALCulate:EVM:WLENgth?

EVM Window Length Query

Function

This command queries the FFT window length.

Query

```
:CALCulate:EVM:WLENgth?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | FF window length |
| Range | 0 to 142 Ts |
| Resolution | 1 Ts |

Example of Use

To query the FFT window length.

```
CALC:EVM:WLEN?
> 10
```

# :CALCulate:EVM:WLENgth:W <integer>

EVM Window Length

## Function

This command sets the FFT window length by constant W specified by 3GPP.

## Command

```
:CALCulate:EVM:WLENgth:W <integer>
```

## Parameter

`<integer>` FFT window length

Range
- When Channel Bandwidth is 1.4 MHz:
  - 0 to 8 (default value: 5)
- When Channel Bandwidth is 3 MHz:
  - 0 to 17 (default value: 12)
- When Channel Bandwidth is 5 MHz:
  - 0 to 35 (default value: 32)
- When Channel Bandwidth is 10 MHz:
  - 0 to 71 (default value: 66)
- When Channel Bandwidth is 15 MHz:
  - 0 to 106 (default value: 10)
- When Channel Bandwidth is 20 MHz:
  - 0 to 142 (default value: 136)

| | |
|---|---|
| Resolution | 1 |
| Suffix code | None |
| Default value | 32 (Channel Bandwidth 5 MHz) |

## Details

If the channel bandwidth is changed, the EVM window length is restored to the default value according to the changed channel bandwidth.

There is no association between the values set to Ts and W. Whether to apply the value of Ts or W for measurement can be specified by the command `:CALCulate:EVM:WLENgth:TYPE`.

## Example of Use

To set 32 for the FFT window length.

```
CALC:EVM:WLEN:W 32
```

## :CALCulate:EVM:WLENgth:W?

EVM Window Length Query

Function

This command queries the FFT window length as constant W specified by 3GPP.

Query

```
:CALCulate:EVM:WLENgth:W?
```

Response

`<integer>`

Parameter

| | | |
|---|---|---|
| `<integer>` | FFT window length | |
| | When Channel Bandwidth is 1.4 MHz: | 0 to 8 |
| | When Channel Bandwidth is 3 MHz: | 0 to 17 |
| | When Channel Bandwidth is 5 MHz: | 0 to 35 |
| | When Channel Bandwidth is 10 MHz: | 0 to 71 |
| | When Channel Bandwidth is 15 MHz: | 0 to 106 |
| | When Channel Bandwidth is 20 MHz: | 0 to 142 |
| Resolution | 1 | |

Example of Use

To query the setting of the FFT window.

```
CALC:EVM:WLEN:W?
> 32
```

## :CALCulate:EVM:WLENgth:TYPE TS|W

EVM Window Length - Type

Function

This command sets the type of EVM window length to be applied for measurement.

Command

```
:CALCulate:EVM:WLENgth:TYPE <mode>
```

Parameter

| | |
|---|---|
| <mode> | EVM Window Length Type |
| W | W (Default) |
| TS | Ts |

Example of Use

To set Ts for the EVM window length type.

```
CALC:EVM:WLEN:TYPE TS
```

## :CALCulate:EVM:WLENgth:TYPE?

EVM Window Length - Type Query

Function

This command queries the type of EVM window length to be applied for measurement.

Query

```
:CALCulate:EVM:WLENgth:TYPE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | EVM Window Length Type |
| W | W |
| TS | Ts |

Example of Use

To query the setting of the EVM window length type.

```
CALC:EVM:WLEN:TYPE?
> TS
```

## 2.3.15 Channel Estimation

### :CALCulate:EVM:CHANnel:ESTimation OFF|ON|0|1

Channel Estimation

Function

This command sets the Channel Estimation function to On/Off.

Command

```
:CALCulate:EVM:CHANnel:ESTimation <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Channel Estimation On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Example of Use

To set the Channel Estimation function to On.

```
CALC:EVM:CHAN:EST ON
```

### :CALCulate:EVM:CHANnel:ESTimation?

Channel Estimation Query

Function

This command queries the setting of the Channel Estimation function.

Query

```
:CALCulate:EVM:CHANnel:ESTimation?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Channel Estimation On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting of the Channel Estimation function.

```
CALC:EVM:CHAN:EST?
> 1
```

## 2.3.16 DwPTS

### :CALCulate:EVM:DWPTs INCLude|EXCLude

DwPTS

Function

This commands sets whether to include/exclude DwPTS for analysis.

Command

```
:CALCulate:EVM:DWPTs INCLude|EXCLude
```

Parameter

| | |
|---|---|
| <mode> | DwPTS |
| INCLude | Include |
| EXCLude | Exclude (Default) |

Example of Use

To exclude DwPTS for EVM calculation.

```
CALC:EVM:DWPT EXCL
```

### :CALCulate:EVM:DWPTs?

DwPTS Query

Function

This commands queries whether to include/exclude DwPTS for analysis.

Query

```
:CALCulate:EVM:DWPTs?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | DwPTS |
| INCL | Include |
| EXCL | Exclude |

Example of Use

To query the DwPTS setting for EVM calculation.

```
CALC:EVM:DWPT?
> EXCL
```

## 2.3.17 Measurement Filter Type

### :CALCulate:EVM:MFILter NORMal|NARRow

Measurement Filter Type

Function

This command sets the filter type used for modulation analysis.

***Note:***

This function is not available for Mean Power and Output Power measurements.

Command

```
:CALCulate:EVM:MFILter <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Filter type |
| `NORMal` | Use this when measuring single carrier signal. (Default) |
| `NARRow` | For measuring multi-carrier signal. |

Details

Even if Narrow is selected, this function measures only one carrier signal. Narrow cannot be selected when Extended Freq Lock Range is set to On.

Example of Use

To set the Measurement Filter Type for multi-carrier measurement

```
CALC:EVM:MFIL NARR
```

## :CALCulate:EVM:MFILter?

Measurement Filter Type Query

**Function**

This command queries the filter type used for modulation analysis.

**Query**

```
:CALCulate:EVM:MFILter?
```

**Response**

`<mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | Number of RS |
| `NORM` | For measuring single carrier signal. |
| `NARR` | For measuring multi-carrier signal. |

**Details**

Even if Narrow is selected, this function measures only one carrier signal. Narrow cannot be selected when Extended Freq Lock Range is set to On.

**Example of Use**

To query the Measurement Filter Type

```
CALC:EVM:MFIL?
> NARR
```

## 2.3.18 Extended Freq Lock Range

### [:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe OFF|ON|0|1

Extended Freq Lock Range

Function

This command sets whether to extend the frequency lock range for signal detection.

Command

```
[:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe OFF|ON|0|1
```

Parameter

| | |
|---|---|
| <mode> | Extended Freq Lock Range |
| OFF\|0 | Does not extend signal detection range (Default) |
| ON\|1 | Extends signal detection range |

Details

Narrow cannot be selected when Measurement Filter Type is set to On.

Example of Use

To extend the signal detection range

```
EVM:EXT:FREQ:LOCK:RANG ON
```

### [:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe?

Extended Freq Lock Range Query

Function

This command queries the filter type used for measurement.

Query

```
[:SENSe]:EVM:EXTended:FREQuency:LOCK:RANGe?
```

Response

<mode>

Parameter

| | |
|---|---|
| <mode> | Extended Freq Lock Range |
| 0 | Does not extend signal detection range |
| 1 | Extends signal detection range |

Details

Narrow cannot be selected when Measurement Filter Type is set to On.

Example of Use

To query the Extended Freq Lock Range setting

```
EVM:EXT:FREQ:LOCK:RANG?
>1
```

### 2.3.19 PBCH

## :CALCulate:EVM:PBCH[:STATe] OFF|ON|0|1

PBCH On/Off

Function

This command sets whether to include (On) or exclude (Off) PBCH as the measurement target.

Command

```
:CALCulate:EVM:PBCH[:STATe] <switch>
```

Parameter

| | |
|---|---|
| <switch> | PBCH On/Off |
| OFF\|0 | Off |
| ON\|1 | On (Default) |

Details

This command is available when Test Model is set to Off.

Example of Use

To configure a setting to include PBCH as the measurement target.

```
CALC:EVM:PBCH ON
```

## :CALCulate:EVM:PBCH[:STATe]?

PBCH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PBCH as the measurement target.

Query

```
:CALCulate:EVM:PBCH[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | PBCH On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the setting for PBCH.

```
CALC:EVM:PBCH?
> 1
```

## :CALCulate:EVM:PBCH:POWer:AUTO OFF|ON|0|1

PBCH Power Auto

Function

This command enables or disables automatic detection of PBCH power.

Command

```
:CALCulate:EVM:PBCH:POWer:AUTO <switch>
```

Parameter

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

Details

This setting is enabled when Test Model is set to Off and when PBCH is set to On.

Example of Use

To enable automatic detection of PBCH power.

```
CALC:EVM:PBCH:POW:AUTO ON
```

## :CALCulate:EVM:PBCH:POWer:AUTO?

PBCH Power Auto Query

Function

This command queries whether automatic detection of PBCH power is enabled.

Query

```
:CALCulate:EVM:PBCH:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query whether automatic detection of PBCH power is enabled.

```
CALC:EVM:PBCH:POW:AUTO?
> 1
```

## :CALCulate:EVM:PBCH:POWer:BOOSting <rel_power>

PBCH Power Boosting

**Function**

This command sets the PBCH boosting level.

**Command**

```
:CALCulate:EVM:PBCH:POWer:BOOSting <rel_power>
```

**Parameter**

| | |
|---|---|
| `<rel_power>` | PBCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

**Details**

This setting is enabled when Test Model is set to Off and when PBCH Power Auto is set to Off.

**Example of Use**

To set the PBCH boosting level to +10 dB.

```
CALC:EVM:PBCH:POW:BOOS 10
```

## :CALCulate:EVM:PBCH:POWer:BOOSting?

PBCH Power Boosting Query

**Function**

This command queries the PBCH boosting level.

**Query**

```
:CALCulate:EVM:PBCH:POWer:BOOSting?
```

**Response**

```
<rel_power>
```

**Parameter**

| | |
|---|---|
| `<rel_power>` | PBCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

**Example of Use**

To query the PBCH boosting level.

```
CALC:EVM:PBCH:POW:BOOS?
> 10.000
```

## 2.3.20 Primary Synchronization Signal

### :CALCulate:EVM:PSS[:STATe] OFF|ON|0|1

P-SS On/Off

**Function**

This command sets whether to include (On) or exclude (Off) Primary Synchronization Signal as the measurement target.

**Command**

```
:CALCulate:EVM:PSS[:STATe] <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | Primary Synchronization Signal On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

**Details**

This setting is enabled when Test Model is set to Off and when Reference Signal is selected for the Synchronization Mode.

**Example of Use**

To configure a setting to include Primary Synchronization Signal as the measurement target.

```
CALC:EVM:PSS ON
```

## :CALCulate:EVM:PSS[:STATe]?

P-SS On/Off Query

**Function**

This command queries whether to include (On) or exclude (Off) Primary Synchronization Signal as the measurement target.

**Query**

```
:CALCulate:EVM:PSS[:STATe]?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | Primary Synchronization Signal On/Off |
| `0` | Off |
| `1` | On |

**Example of Use**

To query the setting for Primary Synchronization Signal.

```
CALC:EVM:PSS?
> 1
```

## :CALCulate:EVM:PSS:POWer:AUTO OFF|ON|0|1

P-SS Power Auto

### Function

This command enables or disables automatic detection of primary synchronization signal power.

### Command

```
:CALCulate:EVM:PSS:POWer:AUTO <switch>
```

### Parameter

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

### Details

This setting is enabled when Test Model is set to Off and when P-SS is set to On.

### Example of Use

To enable automatic detection of primary synchronization signal power.

```
CALC:EVM:PSS:POW:AUTO ON
```

## :CALCulate:EVM:PSS:POWer:AUTO?

P-SS Power Auto Query

### Function

This command queries the status of automatic detection of primary synchronization signal power.

### Query

```
:CALCulate:EVM:PSS:POWer:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of primary synchronization signal power is enabled.

```
CALC:EVM:PSS:POW:AUTO?
> 1
```

## :CALCulate:EVM:PSS:POWer:BOOSting <rel_power>

P-SS Power Boosting

### Function

This command sets the primary synchronization signal boosting level.

### Command

```
:CALCulate:EVM:PSS:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Primary synchronization signal boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

### Details

This setting is enabled when Test Model is set to Off, P-SS is set to On, and when P-SS Power Auto is set to Off.

### Example of Use

To set the primary synchronization signal boosting level to +10 dB.

```
CALC:EVM:PSS:POW:BOOS 10
```

## :CALCulate:EVM:PSS:POWer:BOOSting?

P-SS Power Boosting Query

Function

This command queries the primary synchronization signal boosting level.

Query

```
:CALCulate:EVM:PSS:POWer:BOOSting?
```

Response

```
<rel_power>
```

Parameter

| | |
|---|---|
| <rel_power> | Primary synchronization signal boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

Example of Use

To query the primary synchronization signal boosting level.

```
CALC:EVM:PSS:POW:BOOS?
> 10.00
```

## 2.3.21 Secondary Synchronization Signal

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

S-SS On/Off

Function

This command sets whether to include (On) or exclude (Off) Secondary Synchronization Signal as the measurement target.

Command

```
:CALCulate:EVM:SSS[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Secondary Synchronization Signal On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This setting is enabled when Test Model is set to Off and when Reference Signal is selected for the Synchronization Mode.

Example of Use

To configure a setting to include Secondary Synchronization Signal as the measurement target.

```
CALC:EVM:SSS ON
```

## :CALCulate:EVM:SSS[:STATe]?

S-SS On/Off Query

### Function

This command queries whether to include (On) or exclude (Off) Secondary Synchronization Signal as the measurement target.

### Query

```
:CALCulate:EVM:SSS[:STATe]?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | Secondary Synchronization Signal On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query the setting for Secondary Synchronization Signal.

```
CALC:EVM:SSS?
> 1
```

## :CALCulate:EVM:SSS:POWer:AUTO OFF|ON|0|1

S-SS Power Auto

### Function

This command enables or disables automatic detection of secondary synchronization signal power.

### Command

```
:CALCulate:EVM:SSS:POWer:AUTO <switch>
```

### Parameter

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

### Details

This setting is enabled when Test Model is set to Off and when S-SS is set to On.

### Example of Use

To enable automatic detection of secondary synchronization signal power.

```
CALC:EVM:SSS:POW:AUTO ON
```

# :CALCulate:EVM:SSS:POWer:AUTO?

S-SS Power Auto Query

## Function

This command queries the status of automatic detection of secondary synchronization signal power.

## Query

```
:CALCulate:EVM:SSS:POWer:AUTO?
```

## Response

```
<switch>
```

## Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

## Example of Use

To query whether automatic detection of secondary synchronization signal power is enabled.

```
CALC:EVM:SSS:POW:AUTO?
> 1
```

## :CALCulate:EVM:SSS:POWer:BOOSting <rel_power>

S-SS Power Boosting

### Function

This command sets the secondary synchronization signal boosting level.

### Command

```
:CALCulate:EVM:SSS:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Secondary synchronization signal boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

### Details

This setting is enabled when Test Model is set to Off, S-SS is set to On, and when S-SS Power Auto is set to Off.

### Example of Use

To set the secondary synchronization signal boosting level to +10 dB.

```
CALC:EVM:SSS:POW:BOOS 10
```

## :CALCulate:EVM:SSS:POWer:BOOSting?

S-SS Power Boosting Query

### Function

This command queries the secondary synchronization signal boosting level.

### Query

```
:CALCulate:EVM:SSS:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Secondary synchronization signal boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the secondary synchronization signal boosting level.

```
CALC:EVM:SSS:POW:BOOS?
> 10.000
```

## 2.3.22 PDCCH

### :CALCulate:EVM:PDCCh[:STATe] OFF|ON|0|1

PDCCH On/Off

Function

This command sets whether to include (On) or exclude (Off) PDCCH for the measurement target.

Command

```
:CALCulate:EVM:PDCCh[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PDCCH On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when Test Model is set to Off.

Example of Use

To configure a setting to include PDCCH as the measurement target.

```
CALC:EVM:PDCC ON
```

### :CALCulate:EVM:PDCCh [:STATe]?

PDCCH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PDCCH for the measurement target.

Query

```
:CALCulate:EVM:PDCCh[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PDCCH On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting for PDCCH.

```
CALC:EVM:PDCC?
> 1
```

## :CALCulate:EVM:PDCCh:POWer:AUTO OFF|ON|0|1

PDCCH Power Auto

Function

This command enables or disables automatic detection of PDCCH power.

Command

```
:CALCulate:EVM:PDCCh:POWer:AUTO <switch>
```

Parameter

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

Details

This setting is enabled when Test Model is set to Off and when PDCCH is set to On.

Example of Use

To enable automatic detection of PDCCH power.

```
CALC:EVM:PDCC:POW:AUTO ON
```

## :CALCulate:EVM:PDCCh:POWer:AUTO?

PDCCH Power Auto Query

Function

This command queries whether automatic detection of PDCCH power is enabled.

Query

```
:CALCulate:EVM:PDCCh:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PDCCH power is enabled.

```
CALC:EVM:PDCC:POW:AUTO?
> 1
```

## :CALCulate:EVM:PDCCh:POWer:BOOSting <rel_power>

PDCCH Power Boosting

### Function

This command sets the PDCCH boosting level.

### Command

```
:CALCulate:EVM:PDCCh:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | PDCCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

### Details

This setting is enabled when Test Model is set to Off and when PDCCH Power Auto is set to Off.

### Example of Use

To set the PDCCH boosting level to +10 dB.

```
CALC:EVM:PDCC:POW:BOOS 10
```

## :CALCulate:EVM:PDCCh:POWer:BOOSting?

PDCCH Power Boosting Query

Function

This command queries the PDCCH boosting level.

Query

```
:CALCulate:EVM:PDCCh:POWer:BOOSting?
```

Response

```
<rel_power>
```

Parameter

| | | |
|---|---|---|
| <rel_power> | | PDCCH boosting level |
| | Range | –20.000 to +20.000 dB |
| | Resolution | 0.001 dB |

Example of Use

To query the PDCCH boosting level.

```
CALC:EVM:PDCC:POW:BOOS?
> 10.000
```

## :CALCulate:EVM:PDCCh:SYMBol:AUTO OFF|ON|0|1

Number of PDCCH Symbol Auto

### Function

This command enables or disables automatic detection of PDCCH symbol count.

### Command

`:CALCulate:EVM:PDCCh:SYMBol:AUTO <switch>`

### Parameter

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

### Details

This command is available when Test Model is set to Off, PCFICH is set to On and PDCCH is set to On.

### Example of Use

To enable automatic detection of PDCCH symbol count.

`CALC:EVM:PDCC:SYMB:AUTO ON`

## :CALCulate:EVM:PDCCh:SYMBol:AUTO?

Number of PDCCH Symbol Auto Query

### Function

This command queries whether automatic detection of PDCCH symbol count is enabled.

### Query

```
:CALCulate:EVM:PDCCh:SYMBol:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of PDCCH symbol count is enabled.

```
CALC:EVM:PDCC:SYMB:AUTO?
> 1
```

## :CALCulate:EVM:PDCCh:SYMBol:SFRame1|6:NUMBer <integer>

Number of PDCCH Symbol for Subframe 1 and 6

### Function

This command sets the number of symbols for PDCCH, at Subframe 1 and 6.

### Command

```
:CALCulate:EVM:PDCCh:SYMBol:SFRame1|6:NUMBer <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When Channel Bandwidth is 1.4 MHz:<br>2<br>When Channel Bandwidth is other than 1.4 MHz:<br>1 or 2 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 1 |

### Details

This setting is enabled when Test Model is set to Off, PDCCH is set to On, and Number of PDCCH Symbols Auto is set to Off.

### Example of Use

To set the number of symbols for PDCCH to 1, at Subframe 1 and 6.

```
CALC:EVM:PDCC:SYMB:SFR1:NUMB 1
```

## :CALCulate:EVM:PDCCh:SYMBol:NUMBer?

Number of PDCCH Symbol for Subframe 1 and 6Query



### Function

This command queries the number of symbols for PDCCH, at Subframe 1 and 6.

### Query

```
:CALCulate:EVM:PDCCh:SYMBol:SFRame1|6:NUMBer?
```

### Response

```
<integer>
```

### Parameter

| | | |
|---|---|---|
| <integer> | | Number of symbols |
| | Range | When Channel Bandwidth is 1.4 MHz:<br>2<br>When Channel Bandwidth is other than 1.4 MHz:<br>1 or 2 |
| | Resolution | 1 |

### Example of Use

To query the number of symbols for PDCCH.

```
CALC:EVM:PDCC:SYMB:SFR1:NUMB?
> 1
```

## :CALCulate:EVM:PDCCh:SYMBol:NUMBer <integer>

Number of PDCCH Symbol

### Function

This command sets the number of symbols for PDCCH.

### Command

```
:CALCulate:EVM:PDCCh:SYMBol:NUMBer <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When Channel Bandwidth is 1.4 MHz:<br>2 to 4<br>When Channel Bandwidth is other than 1.4 MHz:<br>1 to 3 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Details

This setting is enabled when Test Model is set to Off, PDCCH is set to On, and Number of PDCCH Symbols Auto is set to Off.

### Example of Use

To set 1 for the number of symbols for PDCCH.

```
CALC:EVM:PDCC:SYMB:NUMB 1
```

## :CALCulate:EVM:PDCCh:SYMBol:NUMBer?

Number of PDCCH Symbol Query

Function

This command queries the number of symbols for PDCCH.

Query

```
:CALCulate:EVM:PDCCh:SYMBol:NUMBer?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When Channel Bandwidth is 1.4 MHz:<br>2 to 4<br>When Channel Bandwidth is other than 1.4 MHz:<br>1 to 3 |
| Resolution | 1 |

Example of Use

To query the number of symbols for PDCCH.

```
CALC:EVM:PDCC:SYMB:NUMB?
> 1
```

## :CALCulate:EVM:PDCCh:MAPPing AUTO|EASY

PDCCH Mapping

Function

This command sets PDCCH Mapping specification method.

Command

```
:CALCulate:EVM:PDCCh:MAPPing <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDCCH Mapping specification method |
| `AUTO` | Automatic |
| `EASY` | Measures according to the PDCCH Format and Number of PDCCHs. |

Details

This command is available when Test Model is set to Off and PDCCH is set to On.

Example of Use

To set PDCCH Mapping automatically .

```
CALC:EVM:PDCC:MAPP AUTO
```

## :CALCulate:EVM:PDCCh:MAPPing?

PDCCH Mapping Query

Function

This command queries the PDCCH Mapping specification method.

Query

```
:CALCulate:EVM:PDCCh:MAPPing?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDCCH Mapping specification method |
| `AUTO` | Automatic |
| `EASY` | Measures according to the specified PDCCH Format and Number of PDCCHs |

Example of Use

To query the PDCCH Mapping specification method.

```
CALC:EVM:PDCC:MAPP?
> AUTO
```

## :CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat 0|1|2|3

PDCCH Format

### Function

This command sets the PDCCH format.

### Command

```
:CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat <mode>
```

### Parameter

| | |
|---|---|
| <mode> | PDCCH Format |
| Range | 0, 1, 2, 3 |
| Default | 0 |

### Details

This setting is enabled when Test Model is set to Off and when PDCCH is set to On.

### Example of Use

To set PDCCH Format to 1.

```
CALC:EVM:PDCC:MAPP:FORM 1
```

## :CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat?

PDCCH Format Query

### Function

This command queries the PDCCH format.

### Query

```
:CALCulate:EVM:PDCCh:MAPPing[:EASY]:FORMat?
```

### Response

| | |
|---|---|
| `<mode>` | PDCCH Format |
| Range | 0, 1, 2, 3 |
| Resolution | 1 |

### Example of Use

To query the PDCCH format.

```
CALC:EVM:PDCC:MAPP:FORM?
> 1
```

## :CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer <integer>

Number of PDCCHs

### Function

This command sets the number of PDCCHs.

### Command

```
:CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of PDCCHs |
| Range | 1 to 88 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 1 |

### Details

This setting is enabled when Test Model is set to Off and when PDCCH is set to On.

### Example of Use

To set 1 as the number of PDCCHs.

```
CALC:EVM:PDCC:MAPP:EASY:NUMB 1
```

## :CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer?

Number of PDCCHs Query

Function

This command queries the number of PDCCHs.

Query

```
:CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer?
```

Response

| | |
|---|---|
| `<integer>` | Number of PDCCHs |
| Range | 1 to 88 |
| Resolution | 1 |

Example of Use

To query the number of PDCCHs.

```
CALC:EVM:PDCC:MAPP:EASY:NUMB?
> 1
```

# 2.3.23 PCFICH

## :CALCulate:EVM:PCFich[:STATe] OFF|ON|0|1

PCFICH On/Off

Function

This command sets whether to include (On) or exclude (Off) PCFICH for the measurement target.

Command

```
:CALCulate:EVM:PCFich[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PCFICH On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when Test Model is set to Off.

Example of Use

To configure a setting to include PCFICH as the measurement target.

```
CALC:EVM:PCF ON
```

## :CALCulate:EVM:PCFich[:STATe]?

PCFICH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PCFICH for the measurement target.

Query

```
:CALCulate:EVM:PCFich[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PCFICH On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting for PCFICH.

```
CALC:EVM:PCF?
> 1
```

## :CALCulate:EVM:PCFich:POWer:AUTO OFF|ON|0|1

PCFICH Power Auto

Function

This command enables or disables automatic detection of PCFICH power.

Command

```
:CALCulate:EVM:PCFich:POWer:AUTO <switch>
```

Parameter

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

Details

This command is available when Test Model is set to Off and PCFICH is set to On.

Example of Use

To enable automatic detection of PCFICH power.

```
CALC:EVM:PCF:POW:AUTO ON
```

## :CALCulate:EVM:PCFich:POWer:AUTO?

PCFICH Power Auto Query

### Function

This command queries whether automatic detection of PCFICH power is enabled.

### Query

```
:CALCulate:EVM:PCFich:POWer:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of PCFICH power is enabled.

```
CALC:EVM:PCF:POW:AUTO?
> 1
```

## :CALCulate:EVM:PCFich:POWer:BOOSting <rel_power>

PCFICH Power Boosting

### Function

This command sets the PCFICH boosting level.

### Command

```
:CALCulate:EVM:PCFich:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | PCFICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

### Details

This command is available when Test Model is set to Off, PCFICH is set to On, and when PDCCH Power Auto is set to Off.

### Example of Use

To set the PCFICH boosting level to +10 dB.

```
CALC:EVM:PCF:POW:BOOS 10
```

## :CALCulate:EVM:PCFich:POWer:BOOSting?

PCFICH Power Boosting Query

### Function

This command queries the PCFICH boosting level.

### Query

```
:CALCulate:EVM:PCFich:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| <rel_power> | PCFICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the PCFICH boosting level.

```
CALC:EVM:PCF:POW:BOOS?
> 10.000
```

## 2.3.24 PHICH

### :CALCulate:EVM:PHICh[:STATe] OFF|ON|0|1

PHICH On/Off

Function

This command sets whether to include (On) or exclude (Off) PHICH for the measurement target.

Command

```
:CALCulate:EVM:PHICh[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PHICH On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when Test Model is set to Off.

Example of Use

To configure a setting to include PHICH as the measurement target.

```
CALC:EVM:PHIC ON
```

### :CALCulate:EVM:PHICh[:STATe]?

PHICH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PHICH for the measurement target.

Query

```
:CALCulate:EVM:PHICh[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | PHICH On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting for PHICH.

```
CALC:EVM:PHIC?
> 1
```

## :CALCulate:EVM:PHICh:POWer:AUTO OFF|ON|0|1

PHICH Power Auto

Function

This command enables or disables automatic detection of PHICH power.

Command

```
:CALCulate:EVM:PHICh:POWer:AUTO <switch>
```

Parameter

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

Details

This command is available when Test Model is set to Off and PHICH is set to On.

Example of Use

To enable automatic detection of PHICH power.

```
CALC:EVM:PHIC:POW:AUTO ON
```

## :CALCulate:EVM:PHICh:POWer:AUTO?

PHICH Power Auto Query

Function

This command queries whether automatic detection of PHICH power is enabled.

Query

```
:CALCulate:EVM:PHICh:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PHICH power is enabled.

```
CALC:EVM:PHIC:POW:AUTO?
> 1
```

## :CALCulate:EVM:PHICh:POWer:BOOSting <rel_power>

PHICH Power Boosting

### Function

This command sets the PHICH boosting level.

### Command

```
:CALCulate:EVM:PHICh:POWer:BOOSting <rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | PHICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

### Details

This command is available when Test Model is set to Off, PHICH is set to On, and when PHICH Power Auto is set to Off.

### Example of Use

To set the PHICH boosting level to +10 dB.

```
CALC:EVM:PHIC:POW:BOOS 10
```

## :CALCulate:EVM:PHICh:POWer:BOOSting?

PHICH Power Boosting Query

**Function**

This command queries the PHICH boosting level.

**Query**

```
:CALCulate:EVM:PHICh:POWer:BOOSting?
```

**Response**

```
<rel_power>
```

**Parameter**

| | |
|---|---|
| <rel_power> | PHICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

**Example of Use**

To query the PHICH boosting level.

```
CALC:EVM:PHIC:POW:BOOS?
> 10.000
```

## :CALCulate:EVM:PHICh:MI1 OFF|ON|0|1

PHICH TDD m_i=1 (E-TM)

**Function**

This command sets the mi of PHICH.

**Command**

```
:CALCulate:EVM:PHICh:MI1 <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | mi of PHICH |
| `OFF|0` | Value defined in 3GPP TS36.211 (Default) |
| `ON|1` | 1 for all subframes |

**Details**

This command is available when Test Model is set to Off. Fixed to On if the Test Model is not Off.

**Example of Use**

To set the mi of PHICH to On.

```
CALC:EVM:PHIC:MI1 ON
```

## :CALCulate:EVM:PHICh:MI1?

PHICH TDD m_i=1 (E-TM) Query

**Function**

This command queries the mi of PHICH.

**Query**

```
:CALCulate:EVM:PHICh:MI1?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | mi of PHICH |
| `OFF|0` | The mi is set to a value defined in 3GPP TS36.211. |
| `ON|1` | The mi is set to 1 for all subframes. |

**Example of Use**

To query the mi of PHICH.

```
CALC:EVM:PHIC:MI1?
> 1
```

## :CALCulate:EVM:PHICh:NG R1BY6|R1BY2|R1|R2

PHICH Ng

### Function

This command sets Ng of PHICH.

### Command

```
:CALCulate:EVM:PHICh:NG <mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Ng of PHICH |
| `R1BY6` | Ng 1/6 (Default) |
| `R1BY2` | Ng 1/2 |
| `R1` | Ng 1 |
| `R2` | Ng 2 |

### Details

This command is available when Test Model is set to Off and when PHICH is set to On.

### Example of Use

To set Ng of PHICH to 1.

```
CALC:EVM:PHIC:NG R1
```

## :CALCulate:EVM:PHICh:NG?

PHICH Ng Query

### Function

This command queries Ng of PHICH.

### Query

```
:CALCulate:EVM:PHICh:NG?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Ng of PHICH |
| `R1BY6` | Ng 1/6 |
| `R1BY2` | Ng 1/2 |
| `R1` | Ng 1 |
| `R2` | Ng 2 |

### Example of Use

To query Ng of PHICH.

```
CALC:EVM:PHIC:NG?
> R1
```

## :CALCulate:EVM:PHICh:DURation NORMal|EXTended

PHICH Duration

Function

This command sets the PHICH duration.

Command

```
:CALCulate:EVM:PHICh:DURation <mode>
```

Parameter

| | |
|---|---|
| <mode> | PHICH Duration |
| NORMal | Normal (Default) |
| EXTended | Extended |

Details

This command is available when Test Model is set to Off, PHICH is set to On.

Example of Use

To set the PHICH duration to Normal.

```
CALC:EVM:PHIC:DUR NORM
```

## :CALCulate:EVM:PHICh:DURation?

PHICH Duration Query

Function

This command queries the PHICH duration.

Query

```
:CALCulate:EVM:PHICh:DURation?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | PHICH Duration |
| NORMal | Normal |
| EXTended | Extended |

Example of Use

To query the PHICH duration.

```
CALC:EVM:PHIC:DUR?
> NORM
```

## 2.3.25 PDSCH

### :CALCulate:EVM:PDSCh:POWer:AUTO OFF|ON|0|1

PDSCH Power Auto

Function

This command enables or disables automatic detection of PDSCH power.

Command

```
:CALCulate:EVM:PDSCh:POWer:AUTO <switch>
```

Parameter

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

Details

This command is available when Test Model is set to Off.

Example of Use

To enable automatic detection of PDSCH power.

```
CALC:EVM:PDSC:POW:AUTO ON
```

### :CALCulate:EVM:PDSCh:POWer:AUTO?

PDSCH Power Auto Query

Function

This command queries whether automatic detection of PDSCH power is enabled.

Query

```
:CALCulate:EVM:PDSCh:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PDSCH power is enabled.

```
CALC:EVM:PDSC:POW:AUTO?
> 1
```

## :CALCulate:EVM:PDSCh:POWer:BOOSting <rel_power>

PDSCH Power Boosting

Function

This command sets the PDSCH boosting level.

Command

```
:CALCulate:EVM:PDSCh:POWer:BOOSting <rel_power>
```

Parameter

| | |
|---|---|
| `<rel_power>` | PDSCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default value | 0.000 dB |

Details

This command is available when Test Model is set to Off and PDSCH Power Auto is set to Off.

Example of Use

To set the PDSCH boosting level to +10 dB.

```
CALC:EVM:PDSC:POW:BOOS 10
```

## :CALCulate:EVM:PDSCh:POWer:BOOSting?

PDSCH Power Boosting Query

Function

This command queries the PDSCH boosting level.

Query

```
:CALCulate:EVM:PDSCh:POWer:BOOSting?
```

Response

```
<rel_power>
```

Parameter

| | |
|---|---|
| `<rel_power>` | PDSCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

Example of Use

To query the PDSCH boosting level.

```
CALC:EVM:PDSC:POW:BOOS?
> 10.000
```

## :CALCulate:EVM:PDSCh:MODE 3GPP|APRE

PDSCH EVM Calculation

### Function

This command sets the PDSCH EVM Calculation target resource block.

### Command

```
:CALCulate:EVM:PDSCh:MODE <mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | PDSCH EVM Calculation target |
| `3GPP` | Conforms to 3GPP definition (Default) |
| `APRE` | All resource elements allotted for PDSCH. |

### Example of Use

To measure according to the 3GPP definition.

```
CALC:EVM:PDSC:MODE 3GPP
```

## :CALCulate:EVM:PDSCh:MODE?

PDSCH EVM Calculation Query

### Function

This command queries the PDSCH EVM Calculation target resource block.

### Query

```
:CALCulate:EVM:PDSCh:MODE?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | PDSCH EVM Calculation target |
| `3GPP` | Conforms to 3GPP definition |
| `APRE` | All resource elements allotted for PDSCH. |

### Example of Use

To query the PDSCH EVM Calculation target

```
CALC:EVM:PDSC:MODE?
> 3GPP
```

## 2.3.26 Total EVM & Constellation Composite

### :CALCulate:EVM:TEVM:RS INCLude|EXCLude

Total EVM & Constellation Composite - RS

Function

This command sets whether to include Reference Signal for Total EVM calculation and Constellation display.

Command

```
:CALCulate:EVM:TEVM:RS <mode>
```

Parameter

| | |
|---|---|
| <mode> | Reference Signal |
| INCLude | Include (Default) |
| EXCLude | Exclude |

Example of Use

To exclude Reference Signal for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:RS EXCL
```

### :CALCulate:EVM:TEVM:RS?

Total EVM & Constellation Composite - RS Query

Function

This command queries the setting whether to include Reference Signal for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:RS?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Reference Signal |
| INCL | Include (Default) |
| EXCL | Exclude |

Example of Use

To query the inclusion/exclusion setting of Reference Signal for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:RS?
> EXCL
```

## :CALCulate:EVM:TEVM:PDSCh INCLude|EXCLude

Total EVM & Constellation Composite - PDSCH

Function

This command sets whether to include PDSCH for Total EVM calculation and Constellation display.

Command

```
:CALCulate:EVM:TEVM:PDSCh <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDSCH |
| `INCLude` | Include (Default) |
| `EXCLude` | Exclude |

Example of Use

To exclude PDSCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PDSC EXCL
```

## :CALCulate:EVM:TEVM:PDSCh?

Total EVM & Constellation Composite - PDSCH Query

Function

This command queries the setting whether to include PDSCH for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:PDSCh?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDSCH |
| `INCL` | Include |
| `EXCL` | Exclude |

Example of Use

To query the inclusion/exclusion setting of PDSCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PDSC?
> EXCL
```

## :CALCulate:EVM:TEVM:PBCH INCLude|EXCLude

Total EVM & Constellation Composite - PBCH

Function

This command sets whether to include PBCH for Total EVM calculation and Constellation display.

Command

```
:CALCulate:EVM:TEVM:PBCH <mode>
```

Parameter

| | |
|---|---|
| <mode> | PBCH |
| INCLude | Include (Default) |
| EXCLude | Exclude |

Example of Use

To exclude PBCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PBCH EXCL
```

## :CALCulate:EVM:TEVM:PBCH?

Total EVM & Constellation Composite - PBCH Query

Function

This command queries the setting whether to include PBCH for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:PBCH?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | PBCH |
| INCL | Included |
| EXCL | Excluded |

Example of Use

To query the inclusion/exclusion setting of PBCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PBCH?
> EXCL
```

## :CALCulate:EVM:TEVM:PSS INCLude|EXCLude

Total EVM & Constellation Composite - P-SS

Function

This command sets whether to include P-SS (Primary Synchronization Signal) for Total EVM calculation and Constellation display.

Command

`:CALCulate:EVM:TEVM:PSS <mode>`

Parameter

| | |
|---|---|
| `<mode>` | Primary synchronization signal |
| `INCLude` | Include (Default) |
| `EXCLude` | Exclude |

Example of Use

To exclude P-SS for Total EVM calculation and Constellation display.

`CALC:EVM:TEVM:PSS EXCL`

## :CALCulate:EVM:TEVM:PSS?

Total EVM & Constellation Composite - P-SS Query

Function

This command queries the setting whether to include P-SS (Primary Synchronization Signal) for Total EVM calculation and Constellation display.

Query

`:CALCulate:EVM:TEVM:PSS?`

Response

`<mode>`

Parameter

| | |
|---|---|
| `<mode>` | Primary synchronization signal |
| `INCL` | Included |
| `EXCL` | Excluded |

Example of Use

To query the inclusion/exclusion setting of P-SS for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PSS?
> EXCL
```

## :CALCulate:EVM:TEVM:SSS INCLude|EXCLude

Total EVM & Constellation Composite - S-SS

**Function**

This command sets whether to include S-SS (Primary Synchronization Signal) for Total EVM calculation and Constellation display.

**Command**

```
:CALCulate:EVM:TEVM:SSS <mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Secondary synchronization signal |
| INCLude | Include (Default) |
| EXCLude | Exclude |

**Example of Use**

To exclude S-SS for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:SSS EXCL
```

## :CALCulate:EVM:TEVM:SSS?

Total EVM & Constellation Composite - S-SS Query

**Function**

This command queries the setting whether to include S-SS for Total EVM calculation and Constellation display.

**Query**

```
:CALCulate:EVM:TEVM:SSS?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Secondary synchronization signal |
| INCL | Included |
| EXCL | Excluded |

**Example of Use**

To query the inclusion/exclusion setting of S-SS for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:SSS?
> EXCL
```

## :CALCulate:EVM:TEVM:PDCCh INCLude|EXCLude

Total EVM & Constellation Composite - PDCCH

Function

This command sets whether to include PDCCH for Total EVM calculation and Constellation display. .

Command

```
:CALCulate:EVM:TEVM:PDCCh <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDCCH |
| `INCLude` | Include (Default) |
| `EXCLude` | Exclude |

Example of Use

To exclude PDCCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PDCC EXCL
```

## :CALCulate:EVM:TEVM:PDCCh?

Total EVM & Constellation Composite - PDCCH Query

Function

This command queries the setting whether to include PDCCH for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:PDCCh?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PDCCH |
| `INCL` | Included |
| `EXCL` | Excluded |

Example of Use

To query the inclusion/exclusion setting of PDCCH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PDCC?
> EXCL
```

## :CALCulate:EVM:TEVM:PCFich INCLude|EXCLude

Total EVM & Constellation Composite - PCFICH

Function

This command sets whether to include PCFICH for Total EVM calculation and Constellation display.

Command

```
:CALCulate:EVM:TEVM:PCFich <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PCFICH |
| `INCLude` | Include (Default) |
| `EXCLude` | Exclude |

Example of Use

To exclude PCFICH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PCF EXCL
```

## :CALCulate:EVM:TEVM:PCFich?

Total EVM & Constellation Composite - PCFICH Query

Function

This command queries the setting whether to include PCFICH for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:PCFich?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | PCFICH |
| `INCL` | Included |
| `EXCL` | Excluded |

Example of Use

To query the inclusion/exclusion setting of PCFICH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PCF?
> EXCL
```

## :CALCulate:EVM:TEVM:PHICh INCLude|EXCLude

Total EVM & Constellation Composite - PHICH

**Function**

This command sets whether to include PHICH for Total EVM calculation and Constellation display.

**Command**

```
:CALCulate:EVM:TEVM:PHICh <mode>
```

**Parameter**

| | |
|---|---|
| <mode> | PHICH |
| INCLude | Include (Default) |
| EXCLude | Exclude |

**Example of Use**

To exclude PHICH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PHIC EXCL
```

## :CALCulate:EVM:TEVM:PHICh?

Total EVM & Constellation Composite - PHICH Query

**Function**

This command queries the setting whether to include PHICH for Total EVM calculation and Constellation display.

**Query**

```
:CALCulate:EVM:TEVM:PHICh?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | PHICH |
| INCL | Included |
| EXCL | Excluded |

**Example of Use**

To query the inclusion/exclusion setting of PHICH for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:PHIC?
> EXCL
```

## :CALCulate:EVM:TEVM:DTX INCLude|EXCLude

Total EVM & Constellation Composite - DTX

Function

This command sets whether to include DTX for Total EVM calculation and Constellation display.

Command

```
:CALCulate:EVM:TEVM:DTX <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | DTX |
| `INCLude` | Include |
| `EXCLude` | Exclude (Default) |

Example of Use

To exclude DTX for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:DTX EXCL
```

## :CALCulate:EVM:TEVM:DTX?

Total EVM & Constellation Composite - DTX Query

Function

This command queries the setting whether to include DTX for Total EVM calculation and Constellation display.

Query

```
:CALCulate:EVM:TEVM:DTX?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | DTX |
| `INCL` | Include |
| `EXCL` | Exclude |

Example of Use

To query the inclusion/exclusion setting of DTX for Total EVM calculation and Constellation display.

```
CALC:EVM:TEVM:DTX?
> EXCL
```

# 2.4 Setting System Parameters (Batch Measurement)

This section describes the device messages related to Batch measurement. Table 2.4-1 lists the device messages used for setting the basic parameters such as frequency and level. Table 2.4-2 lists the device messages used for the communication system of Batch measurement.

**Table 2.4-1 Device Messages for Setting Basic Parameters**

| Parameter | Device Message |
|---|---|
| Band Frequency | [:SENSe]:BATCh:BAND[0]\|1\|2:FREQuency:CENTer <freq> |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:FREQuency:CENTer? |
| Band Frequency Span | [:SENSe]:BATCh:BAND[0]\|1\|2:FREQuency:SPAN? |
| Band Input Level | [:SENSe]:BATCh:BAND[0]\|1\|2:POWer[:RF]:RANGe:ILEVel <real> |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:POWer[:RF]:RANGe:ILEVel? |
| Band Level Offset Value | :DISPlay:BATCh:BAND[0]\|1\|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel :OFFSet <rel_power> |
| | :DISPlay:BATCh:BAND[0]\|1\|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel :OFFSet? |
| Band Level Offset State | :DISPlay:BATCh:BAND[0]\|1\|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel :OFFSet:STATe OFF\|ON\|0\|1 |
| | :DISPlay:BATCh:BAND[0]\|1\|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel :OFFSet:STATe? |
| Band Pre-Amp | [:SENSe]:BATCh:BAND[0]\|1\|2:POWer[:RF]:GAIN[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:POWer[:RF]:GAIN[:STATe]? |

**Table 2.4-2 Device Messages for Setting System Parameters**

<table>
<tr><th>Parameter</th><th>Device Message</th></tr>
<tr><td rowspan="2">CC Bandwidth</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth 20|15|10|5|3|1M4</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth?</td></tr>
<tr><td rowspan="2">CC Test Model</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel OFF|TM1_1|TM1_2|TM2|TM3_1|TM3_2|TM3_3</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel?</td></tr>
<tr><td rowspan="2">CC Test Model Starting Frame Type</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe UNLock|FRAMe1|FRAMe2</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe?</td></tr>
<tr><td rowspan="2">CC Uplink-downlink Configuration</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration?</td></tr>
<tr><td rowspan="2">CC Special Subframe Configuration</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration?</td></tr>
<tr><td rowspan="2">CC Synchronization Mode</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE RS|SS</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE?</td></tr>
<tr><td rowspan="8">CC Reference Signal</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:Number 1|2|4</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:Number?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:APORt <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:APORt?</td></tr>
<tr><td rowspan="2">Batch Analysis Time Starting Subframe Number</td><td>[:SENSe]:BATCh:CAPTure:TIME:STARt <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CAPTure:TIME:STARt?</td></tr>
<tr><td rowspan="2">Batch Analysis Time Measurement Interval</td><td>[:SENSe]:BATCh:CAPTure:TIME:LENGth <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CAPTure:TIME:LENGth?</td></tr>
<tr><td rowspan="2">Batch Analysis Time Starting OFDM Symbol Number</td><td>[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt?</td></tr>
<tr><td rowspan="2">Batch Analysis Time Measurement Interval</td><td>[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth <integer></td></tr>
<tr><td>[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth?</td></tr>
</table>

**Table 2.4-2 Device Messages for Setting System Parameters (Cont'd)**

<table>
<tr><th>Parameter</th><th>Device Message</th></tr>
<tr><td rowspan="2">CC PDSCH Modulation Scheme</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation QPSK|16Qam|64Qam|256Qam|AUTO</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation?</td></tr>
<tr><td rowspan="6">CC EVM Window Length</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE TS|W</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE?</td></tr>
<tr><td rowspan="2">CC Batch Channel Estimation</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation?</td></tr>
<tr><td rowspan="2">CC DwPTS</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs INCLude|EXCLude</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs?</td></tr>
<tr><td rowspan="2">CC DwPTS for Unwanted Emission</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs:UWEMission INCLude|EXCLude</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs:UWEMission?</td></tr>
<tr><td rowspan="2">CC Measurement Filter Type</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter NORMal|NARRow</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter?</td></tr>
<tr><td rowspan="2">CC PBCH On/Off</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe] OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe]?</td></tr>
<tr><td rowspan="2">CC PBCH Power Auto</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO?</td></tr>
<tr><td rowspan="2">CC PBCH Power Boosting</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting?</td></tr>
<tr><td rowspan="2">CC P-SS On/Off</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe] OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe]?</td></tr>
<tr><td rowspan="2">CC P-SS Power Auto</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO?</td></tr>
<tr><td rowspan="2">CC P-SS Power Boosting</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting?</td></tr>
</table>

Table 2.4-2 Device Messages for Setting System Parameters (Cont'd)

| Parameter | Device Message |
|---|---|
| CC S-SS On/Off | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS[:STATe]? |
| CC S-SS Power Auto | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS:POWer:AUTO? |
| CC S-SS Power Boosting | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS:POWer:BOOSting <rel_power> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:SSS:POWer:BOOSting? |
| CC PDCCH On/Off | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh[:STATe]? |
| CC PDCCH Power Auto | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:POWer:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:POWer:AUTO? |
| CC PDCCH Power Boosting | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:POWer:BOOSting <rel_power> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:POWer:BOOSting? |
| CC Number of PDCCH Symbols | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:AUTO OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:AUTO? |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:SFRame1\|6:NUMBer <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:SFRame1\|6:NUMBer? |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:NUMBer <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:SYMBol:NUMBer? |
| CC PDCCH Mapping | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing AUTO\|EASY |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing? |
| CC PDCCH Format | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing:EASY:FORMat 0\|1\|2\|3 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing:EASY:FORMat? |
| CC Number of PDCCHs | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing:EASY:NUMBer <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:PDCCh:MAPPing:EASY:NUMBer? |

**Table 2.4-2 Device Messages for Setting System Parameters (Cont'd)**

<table>
<tr><th>Parameter</th><th>Device Message</th></tr>
<tr><td rowspan="2">CC PCFICH On/Off</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe] OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe]?</td></tr>
<tr><td rowspan="2">CC PCFICH Power Auto</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO?</td></tr>
<tr><td rowspan="2">CC PCFICH Power Boosting</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting?</td></tr>
<tr><td rowspan="2">CC PHICH On/Off</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe] OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe]?</td></tr>
<tr><td rowspan="2">CC PHICH Power Auto</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO?</td></tr>
<tr><td rowspan="2">CC PHICH Power Boosting</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting?</td></tr>
<tr><td rowspan="2">CC PHICH Ng</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG R1BY6|R1BY2|R1|R2</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG?</td></tr>
<tr><td rowspan="2">CC PHICH Duration</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation NORMal|EXTended</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation?</td></tr>
<tr><td rowspan="2">CC PDSCH Power Auto</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO?</td></tr>
<tr><td rowspan="2">CC PDSCH Power Boosting</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting <rel_power></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting?</td></tr>
<tr><td rowspan="2">Batch Modulation Analysis</td><td>[:SENSe]:BATCh:EVM[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:EVM[:STATe]?</td></tr>
<tr><td rowspan="2">Batch OBW</td><td>[:SENSe]:BATCh:OBW[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:OBW[:STATe]?</td></tr>
<tr><td rowspan="2">Batch ACLR</td><td>[:SENSe]:BATCh:ACLR[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:ACLR[:STATe]?</td></tr>
<tr><td rowspan="2">Batch OBUE</td><td>[:SENSe]:BATCh:OBUE[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:OBUE[:STATe]?</td></tr>
</table>

Table 2.4-2 Device Messages for Setting System Parameters (Cont'd)

| Parameter | Device Message |
|---|---|
| Batch Measure Band | [:SENSe]:BATCh:BAND[0]\|1\|2[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:BATCh:BAND[0]\|1\|2[:STATe]? |
| Batch Measure CC | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4[:STATe]? |
| Band Contiguous Mode | [:SENSe]:BATCh:BAND[0]\|1\|2:CONTiguous OFF\|ON\|0\|1 |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:CONTiguous? |
| Band OBUE Standard | [:SENSe]:BATCh:BAND[0]\|1\|2:OBUE:STANdard WIDE_A_U1G\|WIDE_A_U1G\|WIDE_A_O1G_U3G\|WIDE_A_O3G\|WIDE_B1_U1G\|WIDE_B1_O1G_U3G\|WIDE_B1_O3G\|WIDE_B2\|LOCAL_U3G\|LOCAL_O3G\|HOME_U3G\|HOME_O3G |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:OBUE:STANdard? |
| Band OBUE Standard Additional | [:SENSe]:BATCh:BAND[0]\|1\|2:OBUE:STANdard:ADDitional OFF\|2 |
| | [:SENSe]:BATCh:BAND[0]\|1\|2:OBUE:STANdard:ADDitional? |
| CC Frequency Band | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4:FREQuency:BAND 0\|1\|2 |
| | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4:FREQuency:BAND? |
| CC Frequency Offset | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4:FREQuency:OFFSet <freq> |
| | [:SENSe]:BATCh:CC[0]\|1\|2\|3\|4:FREQuency:OFFSet? |
| CC CSI-RS On/Off | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs[:STATe]? |
| CC CSI-RS Configuration | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:CONFig <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:CONFig? |
| CC CSI-RS Periodicity T | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:PERiodicity 5\|10 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:PERiodicity? |
| CC CSI-RS Subframe Offset | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:SUBFrame:OFFSet <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:SUBFrame:OFFSet? |
| CC CSI-RS Number of Antenna Ports | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:ANTenna:NUMBer 1\|2\|4\|8 |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs:ANTenna:NUMBer? |
| CC CSI-RS Antenna Port | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs: APORt <integer> |
| | :CALCulate:BATCh:CC[0]\|1\|2\|3\|4:CSIRs: APORt? |

### 2.4.1 Band Frequency

## [:SENSe]:BATCh:BAND[0]|1|2:FREQuency:CENTer <freq>

Band Frequency

**Function**

This command sets the band frequency for the signal to be measured.

**Command**

```
[:SENSe]:BATCh:BAND[0]|1|2:FREQuency:CENTer <freq>
```

**Parameter**

| | |
|---|---|
| `<freq>` | Band frequency |
| Range | 100 MHz to the upper limit of the main unit<br>100 MHz to the upper limit of the main unit (MS269xA-004/104/078/178)<br>300 MHz to the upper limit of the main unit (MS2830A-078) |
| Resolution | 1 Hz |
| Suffix code | `HZ`, `KHZ`, `KZ`, `MHZ`, `MZ`, `GHZ`, `GZ`<br>Hz is used when omitted. |
| Default | 2110 MHz (Band0)<br>1960 MHz (Band1)<br>1842.5MHz (Band2) |

**Details**

This command is not available when the Replay function is executed.
Band1 and Band2 can be selected only when the MX269022A-001 and MS269xA-004/104/078/178 are installed.
However, Band1 and Band2 cannot be selected when MS2830A is used.

**Example of Use**

To set the frequency of the Band0 to 1.000 GHz.

```
BATC:BAND:FREQ:CENT 1.000GHZ
```

## [:SENSe]:BATCh:BAND[0]|1|2:FREQuency:CENTer?

Band Frequency Query

### Function

This command queries the band frequency of the measured signal.

### Query

```
[:SENSe]:BATCh:BAND[0]|1|2:FREQuency:CENTer?
```

### Response

```
<freq>
```

### Parameter

| | | |
|---|---|---|
| <freq> | | Band frequency |
| | Range | 100 MHz to the upper limit of the main unit<br>100 MHz to the upper limit of the main unit (MS269xA-004/104/078/178)<br>300 MHz to the upper limit of the main unit (MS2830A-078) |
| | Resolution | 1 Hz<br>Value is returned in Hz units. |

### Example of Use

To query the Band0 frequency.

```
BATC:BAND:FREQ:CENT?
> 1000000000
```

## 2.4.2 Band Frequency Span?

### [:SENSe]:BATCh:BAND[0]|1|2:FREQuency:SPAN?

Band Frequency Span Query

**Function**

This command queries the band frequency span.

**Query**

`[:SENSe]:BATCh:BAND[0]|1|2:FREQuency:SPAN?`

**Parameter**

| | |
|---|---|
| <freq> | Band frequency span |
| Range | 31.25 MHz |
| | 31.25 MHz, 125 MHz |
| | (MS269xA-004/104/078/178, MS2830A-078) |
| Resolution | 1 Hz |
| | Value is returned in Hz units. |

**Details**

Band1 and 2 are available when the MX269022A-001 is installed.
However, they are unavailable if the MS2830A-078 is installed.

**Example of Use**

To query the Band0 frequency span.

```
BATC:BAND:FREQ:SPAN?
> 125000000
```

### 2.4.3 Band Input Level

[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:RANGe:ILEVel <real>

Band Input Level

Function

This command sets the input level of RF signals.

Command

```
[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:RANGe:ILEVel
<real>
```

Parameter

| | |
|---|---|
| `<real>` | Input level |
| Range | (–60.00 + level offset) to (30.00 + level offset) dBm (Pre-Amp Off)<br>(–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp On) |
| Resolution | 0.01 dB |
| Unit | 1 dBm |
| Suffix code | `DBM`<br>dBm is used when omitted. |
| Default | –10.00 dBm |

Details

The setting range when Pre Amp is Off is applied if the MS2690A/MS2691A/MS2692A Option 008/108 6 GHz Preamplifier or MS2830A Option 008/208 Preamplifier (hereinafter referred to as "Option 008") is not installed.

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

Example of Use

To set the input level to 0 dBm.

```
BATC:BAND:POW:RANG:ILEV 0
```

## [:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:RANGe:ILEVel?

Band Input Level Query

### Function

This command queries the input level of RF signals.

### Query

`[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:RANGe:ILEVel?`

### Response

`<real>`

### Parameter

| | |
|---|---|
| `<real>` | Input level |
| Range | (–60.00 + level offset) to (30.00 + level offset) dBm (Pre-Amp Off) |
| | (–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp On) |
| Resolution | 0.01 dB |
| | Value is returned in dBm units. |

### Example of Use

To query the input level.

```
BATC:BAND:POW:RANG:ILEV?
> 0.00
```

### 2.4.4 Band Level Offset

:DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>

Band Level Offset Value

Function

This command sets the offset value for the input level.

Command

```
:DISPlay:BATCh:BAND[0]|1|2: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<br>dB is used when omitted. |
| Default | 0 dB |

Example of Use

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

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

## :DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?

Band Level Offset Value Query

Function

This command queries the offset value of the input level.

Query

```
:DISPlay:BATCh:BAND[0]|1|2: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 query the offset value of the input level.

```
DISP:BATC:BAND:WIND:TRAC:Y:RLEV:OFFS?
> 10.00
```

### 2.4.5 Band Level Offset State

## :DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1

Band Level Offset State

**Function**

This command enables/disables the input level offset function.

**Command**

```
:DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe <switch>
```

**Parameter**

| | |
|---|---|
| <switch> | Enables/disables input level offset function |
| OFF\|0 | Disables the input level offset function (Default). |
| ON\|1 | Enables the input level offset function. |

**Example of Use**

To enable the input level offset function.

```
DISP:BATC:BAND:WIND:TRAC:Y:RLEV:OFFS:STAT ON
```

## :DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?

Band Level Offset State Query

**Function**

This command queries whether the input level offset function is enabled.

**Query**

```
:DISPlay:BATCh:BAND[0]|1|2:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| <switch> | Enables/disables input level offset function |
| 0 | The input level offset function is disabled. |
| 1 | The input level offset function is enabled. |

**Example of Use**

To query whether the input level offset function is enabled.

```
DISP:BATC:BAND:WIND:TRAC:Y:RLEV:OFFS:STAT?
> 1
```

## 2.4.6 Band Pre Amp State

### [:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1

Band Pre Amp State

Function

This command sets Pre-amp On/Off.

Command

`[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:GAIN[:STATe] <switch>`

Parameter

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

Details

This command is not available in the following situations:
- When Option 008 is not installed.
- When the Replay function is executed.

When Wide Dynamic Range is set to On in Power vs Time measurement, Pre-Amp is changed to Off automatically and this command will be invalid.

Example of Use

To set Pre-amp On.

`BATC:BAND:POW:GAIN ON`

## [:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:GAIN[:STATe]?

Pre Amp State Query

**Function**

This command queries the Pre-amp On/Off state.

**Query**

```
[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:GAIN[:STATe]?
```

**Response**

`<switch>`

**Parameter**

| | |
|---|---|
| `<switch>` | Pre-amp On/Off |
| `0` | Off |
| `1` | On |

**Details**

When Option 008 is not installed, `0` (Pre-amp Off) is returned.

**Example of Use**

To query the Pre-amp On/Off state.

```
BATC:BAND:POW:GAIN?
> 1
```

## 2.4.7 CC Bandwidth

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth 20|15|10|5|3|1M4

CC Bandwidth

Function

This command sets the bandwidth for the CC.

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth <mode>
```

Parameter

| | |
|---|---|
| <mode> | Bandwidth for signal to be measured |
| 20 | Sets a 20 MHz bandwidth signal for analysis. |
| 15 | Sets a 15 MHz bandwidth signal for analysis. |
| 10 | Sets a 10 MHz bandwidth signal for analysis. |
| 5 | Sets a 5 MHz bandwidth signal for analysis (Default). |
| 3 | Sets a 3 MHz bandwidth signal for analysis. |
| 1M4 | Sets a 1.4 MHz bandwidth signal for analysis. |

Example of Use

To set the bandwidth of the CC0 to 5 MHz.

```
BATC:CC:RAD:CBAN 5
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth?

CC Channel Bandwidth Query

**Function**

This command queries the bandwidth of the CC.

**Query**

`[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth?`

**Response**

`<mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | Bandwidth of measured signal |
| `20` | Sets a 20 MHz bandwidth signal for analysis. |
| `15` | Sets a 15 MHz bandwidth signal for analysis. |
| `10` | Sets a 10 MHz bandwidth signal for analysis. |
| `5` | Sets a 5 MHz bandwidth signal for analysis |
| `3` | Sets a 3 MHz bandwidth signal for analysis. |
| `1M4` | Sets a 1.4 MHz bandwidth signal for analysis. |

**Example of Use**

To query the bandwidth of the CC0.

```
BATC:CC:RAD:CBAN?
> 5
```

## 2.4.8 CC Test Model

[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel

OFF|TM1_1|TM1_2|TM2|TM2A|TM3_1|TM3_1A|TM3_2|TM3_3

CC Test Model

Function

This command sets the type of the test model for the CC.

Command

`[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel <mode>`

Parameter

| <mode> | Test model |
|---|---|
| OFF | None (Default) |
| TM1_1 | E-TM 1.1 |
| TM1_2 | E-TM 1.2 |
| TM2 | E-TM 2 |
| TM2A | E-TM 2a |
| TM3_1 | E-TM 3.1 |
| TM3_1A | E-TM 3.1a |
| TM3_2 | E-TM 3.2 |
| TM3_3 | E-TM 3.3 |

Example of Use

To set E-TM1.1 as the test model for the CC0.

`BATC:CC:RAD:TMOD TM1_1`

## [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel?

CC Test Model Query

### Function

This command queries the type of the test model for the CC.

### Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel?
```

### Response

```
<mode>
```

### Parameter

| <mode> | Test model |
|---|---|
| OFF | None |
| TM1_1 | E-TM 1.1 |
| TM1_2 | E-TM 1.2 |
| TM2 | E-TM 2 |
| TM2A | E-TM 2a |
| TM3_1 | E-TM 3.1 |
| TM3_1A | E-TM 3.1a |
| TM3_2 | E-TM 3.2 |
| TM3_3 | E-TM 3.3 |

### Example of Use

To query the type of a test model for the CC0.

```
BATC:CC:RAD:TMOD?
> TM1_1
```

## 2.4.9 CC Test Model Starting Frame Type

### [:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe UNLock|FRAMe1|FRAMe2

CC Test Model Starting Frame Type

Function

This command sets the Frame Offset0 measurement target when measuring the CC Test Model signal (E-TM1.2, 2, 2a, 3.2, 3.3).

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe
UNLock|FRAMe1|FRAMe2
```

Parameter

| | |
|---|---|
| <mode> | Starting Frame Type |
| UNLock | No specified target (Default) |
| FRAMe1 | Specifies frame1 |
| FRAMe2 | Specifies frame2 |

Details

This command is available when CC Test Model is TM1_2, TM2, TM2A, TM3_2, or TM3_3.
If CC Test Model is none of the above, this parameter is set to UNLock.

Example of Use

To set Frame Offset0 measurement target to frame2.

```
BATC:CC:EVM:TMOD:SFTY FRAM2
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe?

CC Test Model Starting frame type Query

Function

This command queries the Frame Offset0 measurement target when measuring the CC Test Model signal (E-TM1.2, 2, 2a, 3.2, 3.3).

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:EVM:TMODel:SFTYpe?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Starting Frame Type |
| `UNL` | Frame Offset0 measurement target not specified |
| `FRAM1` | frame1 specified as Frame Offset0 measurement target |
| `FRAM2` | frame2 specified as Frame Offset0 measurement target |

Example of Use

To query the Frame Offset0 measurement target.

```
BATC:CC:EVM:TMOD:SFTY?
>FRAM1
```

## 2.4.10 CC Uplink-downlink Configuration

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration <integer>

CC Uplink-downlink Configuration

Function

This command sets the CC Uplink-downlink Configuration.

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | CC Uplink-downlink Configuration |
| Range | 0 to 6 |
| Resolution | 1 |
| Suffix code | None |
| Default | 3 |

Details

The setting is available when CC Test Model is set to Off. Fixed to 3 if the Test Model is not Off.

Example of Use

To set the CC Uplink-downlink Configuration of CC0 to 2.

```
BATC:CC:RAD:UDC 2
```

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration?

CC Uplink-downlink Configuration Query

Function

This command queries the CC Uplink-downlink Configuration.

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:UDConfiguration?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | CC Uplink-downlink Configuration |
| Range | 0 to 6 |
| Resolution | 1 |

Example of Use

To query the CC Uplink-downlink Configuration of CC0.

```
BATC:CC:RAD:UDC?
> 2
```

## 2.4.11 CC Special Subframe Configuration

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration <integer>

CC Special Subframe Configuration

Function

This command sets the CC Special Subframe Configuration.

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | CC Special Subframe Configuration |
| Range | 0 to 8 |
| Resolution | 1 |
| Suffix code | None |
| Default | 8 |

Details

The setting is available when Test Model is Off.
Fixed to 8 when Test Model is not Off.

Example of Use

To set CC Special Subframe Configuration of CC0 to 2.

```
BATC:CC:RAD:SSC 2
```

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration?

CC Special Subframe Configuration Query

Function

This command queries the CC Special Subframe Configuration.

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SSConfiguration?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Special Subframe Configuration |
| Range | 0 to 8 |
| Resolution | 1 |

Example of Use

To query the CC Special Subframe Configuration of CC0.

```
BATC:CC:RAD:SSC?
> 2
```

2

SCPI Device Message Details

## 2.4.12 CC Synchronization Mode

### [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE RS|SS

CC Synchronization Mode

Function

This command sets the synchronized signal for the CC.

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | CC Synchronized signal |
| `RS` | Sets Reference Signal for the synchronized signal. |
| `SS` | Sets Synchronization Signal for the synchronized signal (Default). |

Details

This command is available when CC Test Model is set to Off.

Example of Use

To set Reference Signal to the synchronized signal for the CC0.

```
BATC:CC:RAD:SYNC:MODE RS
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE?

CC Synchronization Mode Query

Function

This command queries the synchronized signal for the CC.

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE
?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Synchronized signal |
| RS | Sets Reference Signal for the synchronized signal for the CC. |
| SS | Sets Synchronization Signal for the synchronized signal for the CC. |

Example of Use

To query the synchronized signal for the CC0.

```
BATC:CC:RAD:SYNC:MODE?
> RS
```

## 2.4.13 CC Reference Signal

### :CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid <integer>

CC Reference Signal Cell ID

Function

This command sets the Cell ID for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | CELL ID |
| Range | 0 to 503 |
| Resolution | 1 |
| Suffix code | None |
| Default | 0 |

Details

This command is available when Synchronization Mode is Reference Signal.

Example of Use

To set the Cell ID for the CC0 to 2.

```
CALC:BATC:CC:RSIG:CELL 2
```

### :CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid?

CC Reference Signal Cell ID Query

Function

This command queries the Cell ID for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Cell ID |
| Range | 0 to 503 |
| Resolution | 1 |

Example of Use

To query the Cell ID for the CC0.

```
CALC:BATC:CC:RSIG:CELL?
> 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting <rel_power>

CC Cell Specific RS Power Boosting

### Function

This command sets the boost level of the reference signal for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Boost level of reference signal |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | `DB`<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to Off.

### Example of Use

To set the boost level of the reference signal for the CC0 to +10 dB.

```
CALC:BATC:CC:RSIG:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting?

CC Cell Specific RS Power Boosting Query

### Function

This command queries the boost level of the reference signal for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | Boost level of reference signal |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Details

This command is available when CC Test Model is set to Off.

### Example of Use

To query the boost level of the reference signal for the CC0.

```
CALC:BATC:CC:RSIG:POW:BOOS?
> 10.00
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer 1|2|4

CC Number of Antenna Ports

**Function**

This command sets the number of antennas for the CC.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer <mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Number of antennas |
| 1 | Uses 1 antenna for transmission. |
| 2 | Uses 2 antennas for transmission. |
| 4 | Uses 4 antennas for transmission. |

**Details**

This command is available when CC Test Model is set to Off.

**Example of Use**

To set 2 for the number of antennas for the CC0.

```
CALC:BATC:CC:ANT:NUMB 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer?

CC Number of Antenna Ports Query

**Function**

This command queries the number of antennas for the CC.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Number of antennas |
| 1 | One antenna is used for transmission. |
| 2 | Two antennas are used for transmission. |
| 4 | Four antennas are used for transmission. |

**Example of Use**

To query the number of antennas for the CC0.

```
CALC:BATC:BAND:ANT:NUMB?
> 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:APORt <integer>

CC Antenna Port

Function

This command sets the antenna to be measured for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:APORt <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Antenna to be measured |
| Range | 0 to (Band Number of Antenna Ports –1) |
| Resolution | 1 |
| Suffix code | None |
| Default | 0 |

Details

This command is available when CC Test Model is set to Off.
It is set to the upper limit if the original setting goes out of the parameter range due to the change of Band Number of Antenna Ports or Band#.

Example of Use

To set the antennas to be measured for the CC0 to 2.

```
CALC:BATC:CC:APOR 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:APORt?

CC Antenna Port Query

Function

This command queries the antenna to be measured for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:APORt?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Antenna to be measured |
| Range | 0 to (Band Number of Antenna Ports –1) |
| Resolution | 1 |

Example of Use

To query the antenna to be measured for the CC0.

```
CALC:BATC:CC:APOR?
> 2
```

## 2.4.14 Batch Analysis Time Starting Subframe Number

### [:SENSe]:BATCh:CAPTure:TIME:STARt <integer>

Batch Analysis Time Starting Subframe Number





#### Function

This command sets the analysis start position of Modulation Analysis.

#### Command

```
[:SENSe]:BATCh:CAPTure:TIME:STARt <integer>
```

#### Parameter

`<integer>` Subframe number

Range: Calculate usable subframe numbers for all CCs to measure in the following conditions and use common values (AND).

When Uplink-downlink Configuration is 0,
 0, 5 + 10×N
When Uplink-downlink Configuration is 1,
 0, 4, 5, 9 + 10×N
When Uplink-downlink Configuration is 2,
 0, 3, 4, 5, 8, 9 + 10×N
When Uplink-downlink Configuration is 3,
 0, 5, 6, 7, 8, 9 + 10×N
When Uplink-downlink Configuration is 4,
 0, 4, 5, 6, 7, 8, 9 + 10×N
When Uplink-downlink Configuration is 5,
 0, 3, 4, 5, 6, 7, 8, 9 + 10×N
When Uplink-downlink Configuration is 6,
 0, 5, 9 + 10×N

However, if Test Model Starting Frame Types of all CCs to measure are UNLock, N is from 0 to 4.
Except the above case, N is from 0 to 3.

Resolution: 1
Suffix code: None
Default: 0

#### Example of Use

To set the analysis start position of Modulation Analysis to Subframe number 2.

```
BATC:CAPT:TIME:STAR 2
```

## [:SENSe]:BATCh:CAPTure:TIME:STARt?

Batch Analysis Time Starting Subframe Number Query

### Function

This command queries the analysis start position of Modulation Analysis.

### Query

```
[:SENSe]:BATCh:CAPTure:TIME:STARt?
```

### Response

`<integer>`

### Parameter

`<integer>` Subframe number

Range
- When Uplink-downlink Configuration is 0,
  0, 5 + 10×N
- When Uplink-downlink Configuration is 1,
  0, 4, 5, 9 + 10×N
- When Uplink-downlink Configuration is 2,
  0, 3, 4, 5, 8, 9 + 10×N
- When Uplink-downlink Configuration is 3,
  0, 5, 6, 7, 8, 9 + 10×N
- When Uplink-downlink Configuration is 4,
  0, 4, 5, 6, 7, 8, 9 + 10×N
- When Uplink-downlink Configuration is 5,
  0, 3, 4, 5, 6, 7, 8, 9 + 10×N
- When Uplink-downlink Configuration is 6,
  0, 5, 9 + 10×N

Here, N is from 0 to 4.

Resolution 1

### Example of Use

To query the analysis start position of Modulation Analysis.

```
BATC:CAPT:TIME:STAR?
> 2
```

## 2.4.15 Batch Analysis Time Measurement Interval

### [:SENSe]:BATCh:CAPTure:TIME:LENGth <integer>

Batch Analysis Time Measurement Interval

Function

This command sets the analysis subframe length of Modulation Analysis.

Command

```
[:SENSe]:BATCh:CAPTure:TIME:LENGth <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Analysis subframe length |
| Range | If CC#0-4 Test Model Starting Frame Types are all UNLock,<br>1 to (50 – Batch Analysis Time Starting Subframe Number)<br>Except the above case,<br>1 to (40 – Batch Analysis Time Starting Subframe Number) |
| Resolution | 1 |
| Suffix code | None |
| Default | 10 |

Example of Use

To set the analysis subframe length of Modulation Analysis to 2.

```
BATC:CAPT:TIME:LENG 2
```

2

SCPI Device Message Details

## [:SENSe]:BATCh:CAPTure:TIME:LENGth?

Batch Analysis Time Measurement Interval Query

### Function

This command queries the analysis subframe length of Modulation Analysis.

### Query

```
[:SENSe]:BATCh:CAPTure:TIME:LENGth?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Analysis subframe length |
| Range | If CC#0-4 Test Model Starting Frame Types are all UNLock,<br>1 to (50 – Batch Analysis Time Starting Subframe Number)<br>Except the above case,<br>1 to (40 – Batch Analysis Time Starting Subframe Number) |
| Resolution | 1 |

### Example of Use

To query the analysis subframe length of Modulation Analysis.

```
BATC:CAPT:TIME:LENG?
> 2
```

## 2.4.16 Batch Analysis Time Starting OFDM Symbol Number

[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt <integer>

Batch Analysis Time Starting OFDM Symbol Number

Function

This command sets the analysis start position of Unwanted Emissions.

Command

```
[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | OFDM Symbol number |
| Range | (0 to 13) + 14 × (Common Settings : Range of Starting Subframe Number) |
| Resolution | 1 |
| Suffix code | None |
| Default | 3 |

Example of Use

To set the analysis start position of Unwanted Emissions to OFDM Symbol number 2.

```
BATC:CAPT:TIME:UWEM:STAR 2
```

## [:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt?

Batch Analysis Time Starting OFDM Symbol Number Query

### Function

This command queries the analysis start position of Unwanted Emissions.

### Query

```
[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| <integer> | OFDM Symbol number |
| Range | (0 to 13) + 14 × (Common Settings : Range of Starting Subframe Number) |
| Resolution | 1 |

### Example of Use

To query the analysis start position of Unwanted Emissions.

```
BATC:CAPT:TIME:UWEM:STAR?
> 2
```

### 2.4.17 Batch Analysis Time Measurement Interval for Unwanted Emissions

[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth <integer>

Batch Analysis Time Measurement Interval for Unwanted Emissions

Function

This command sets the analysis OFDM Symbol length of Unwanted Emissions.

Command

```
[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Analysis OFDM Symbol length |
| Range | If CC#0-4 Test Model Starting Frame Types are all UNLock,<br>1 to (700 – Batch Analysis Time Starting Subframe Number)<br>Except the above case,<br>1 to (560 – Batch Analysis Time Starting Subframe Number) |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

Example of Use

To set the analysis OFDM Symbol length of Unwanted Emissions to 2.

```
BATC:CAPT:TIME:UWEM:LENG 2
```

## [:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth?

Batch Analysis Time Measurement Interval for Unwanted Emissions Query

### Function

This command queries the analysis OFDM Symbol length of Unwanted Emissions.

### Query

`[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth?`

### Response

`<integer>`

### Parameter

| | |
|---|---|
| `<integer>` | Analysis OFDM Symbol length |
| Range | If CC#0-4 Test Model Starting Frame Types are all UNLock,<br>1 to (700 – Batch Analysis Time Starting Subframe Number)<br>Except the above case,<br>1 to (560 – Batch Analysis Time Starting Subframe Number) |
| Resolution | 1 |

### Example of Use

To query the analysis OFDM Symbol length of Unwanted Emissions.

```
BATC:CAPT:TIME:UWEM:LENG?
> 2
```

### 2.4.18 CC PDSCH Modulation Scheme

:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation

QPSK|16Qam|64Qam|256Qam|AUTO

CC PDSCH Modulation Scheme

Function

This command sets the PDSCH modulation mode for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation <mode>
```

Parameter

| | |
|---|---|
| <mode> | Modulation mode |
| QPSK | Sets QPSK modulation mode for analysis. |
| 16Qam | Sets 16QAM modulation mode for analysis. |
| 64Qam | Sets 64QAM modulation mode for analysis. |
| 256Qam | Sets 256QAM modulation mode for analysis. |
| AUTO | Analyzes an input signal after judging its modulation scheme automatically (Excluding 256QAM) (default). |

Details

This command is available when CC Test Model is set to Off.

Example of Use

To set the PDSCH modulation mode for the CC0 to QPSK.

```
CALC:BATC:CC:PDSC:MOD QPSK
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation?

CC PDSCH Modulation Scheme Query

### Function

This command queries the PDSCH modulation mode for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Modulation mode |
| `QPSK` | QPSK modulation mode is set for analysis. |
| `16Q` | 16QAM modulation mode is set for analysis. |
| `64Q` | 64QAM modulation mode is set for analysis. |
| `256Q` | 256QAM modulation mode is set for analysis. |
| `AUTO` | Analyzes an input signal after judging its modulation scheme automatically (Excluding 256QAM). |

### Example of Use

To query the PDSCH modulation mode for the CC0.

```
CALC:BATC:CC:PDSC:MOD?
> QPSK
```

## 2.4.19 CC EVM Window

### :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth <integer>

CC EVM Window Length

Function

This command sets the FFT window length for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | FFT window length |
| Range | 0 to 142 Ts |
| Resolution | 1 Ts |
| Suffix code | None |
| Default | When CC Channel Bandwidth is 1.4 MHz: 80 Ts<br>When CC Channel Bandwidth is 3 MHz: 96 Ts<br>When CC Channel Bandwidth is 5 MHz: 128 Ts<br>When CC Channel Bandwidth is 10 MHz: 132 Ts<br>When CC Channel Bandwidth is 15 MHz: 136 Ts<br>When CC Channel Bandwidth is 20 MHz: 136 Ts |

Details

If CC Channel Bandwidth is changed, CC EVM Window Length is restored to the default value according to the changed CC Channel Bandwidth.

There is no correlation between the values set as Ts and W.

The command `:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE` sets either Ts or W to apply to the measurement.

Example of Use

To set the FFT window length for the CC0 to 10.

```
CALC:BATC:CC:WLEN 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth?

CC EVM Window Length Query

Function

This command queries the FFT window length for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | FFT window length |
| Range | 0 to 142 Ts |
| Resolution | 1 Ts |

Example of Use

To query the FFT window length for the CC0.

```
CALC:BATC:CC:WLEN?
> 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W <integer>

CC EVM Window Length

### Function

This command sets the FFT window length for the CC by constant W specified by 3GPP.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W <integer>
```

### Parameter

`<integer>` FFT window length

Range

When CC Channel Bandwidth is 1.4 MHz: 0 to 8 (Default: 5)
When CC Channel Bandwidth is 3 MHz: 0 to 17 (Default: 12)
When CC Channel Bandwidth is 5 MHz: 0 to 35 (Default: 32)
When CC Channel Bandwidth is 10 MHz: 0 to 71 (Default: 66)
When CC Channel Bandwidth is 15 MHz: 0 to 106 (Default: 102)
When CC Channel Bandwidth is 20 MHz: 0 to 142 (Default: 136)

Resolution 1

Suffix code None

### Details

If CC Channel Bandwidth is changed, CC EVM Window Length is restored to the default value according to the changed CC Channel Bandwidth.

There is no association between the values set to Ts and W. Whether to apply the value of Ts or W for measurement can be specified by the command `:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE`.

### Example of Use

To set 32 for the FFT window length for the CC0.

```
CALC:BATC:CC:WLEN:W 32
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W?

CC EVM Window Length Query

### Function

This command queries the FFT window length for the CC as constant W specified by 3GPP.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W?
```

### Response

```
<integer>
```

### Parameter

`<integer>` FFT window length

Range

When CC Channel Bandwidth is 1.4 MHz: 0 to 8
When CC Channel Bandwidth is 3 MHz: 0 to 17
When CC Channel Bandwidth is 5 MHz: 0 to 35
When CC Channel Bandwidth is 10 MHz: 0 to 71
When CC Channel Bandwidth is 15 MHz: 0 to 106
When CC Channel Bandwidth is 20 MHz: 0 to 142

Resolution 1

### Example of Use

To query the setting of the FFT window for the CC0.

```
CALC:BATC:CC:WLEN:W?
> 32
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE TS|W

CC EVM Window Length - Type

Function

This command sets the type of EVM window length for the CC to be applied for measurement.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE <mode>
```

Parameter

| | |
|---|---|
| <mode> | EVM Window Length Type |
| W | W (Default) |
| TS | Ts |

Example of Use

To set Ts for the EVM window length type for the CC0.

```
CALC:BATC:CC:WLEN:TYPE TS
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE?

CC EVM Window Length - Type Query

Function

This command queries the type of EVM window length for the CC to be applied for measurement.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | EVM Window Length Type |
| W | W |
| TS | Ts |

Example of Use

To query the setting of the EVM window length type for the CC0.

```
CALC:BATC:CC:WLEN:TYPE?
> TS
```

## 2.4.20 CC Batch Channel Estimation

### :CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation OFF|ON|0|1

CC Batch Channel Estimation

Function

This command sets the Batch Channel Estimation function for the CC to On/Off.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation
<switch>
```

Parameter

| | |
|---|---|
| <switch> | Channel Estimation On/Off |
| OFF\|0 | Off |
| ON\|1 | On (Default) |

Example of Use

To set the Batch Channel Estimation function for the CC0 to On.

```
CALC:BATC:CC:CHAN:EST ON
```

### :CALCulate:BATCh: CC[0]|1|2|3|4:CHANnel:ESTimation?

CC Batch Channel Estimation Query

Function

This command queries the setting of the Batch Channel Estimation function for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | Channel Estimation On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the setting of the Batch Channel Estimation function for the CC0.

```
CALC:BATC:CC:CHAN:EST?
> 1
```

## 2.4.21 CC DwPTS

### :CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs INCLude|EXCLude

CC DwPTS

Function

This commands sets whether to include/exclude CC DwPTS for analysis.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs <mode>
```

Parameter

| | |
|---|---|
| <mode> | CC DwPTS |
| INCLude | CC DwPTS is included. |
| EXCLude | CC DwPTS is excluded. (Default) |

Example of Use

To exclude CC DwPTS for analysis.

```
CALC:BATC:CC:DWPT EXCL
```

### :CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs?

CC DwPTS Query

Function

This commands queries whether to include/exclude DwPTS for analysis.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | CC DwPTS |
| INCL | CC DwPTS is included. |
| EXCL | CC DwPTS is excluded. |

Example of Use

To query CC DwPTS setting for analysis.

```
CALC:BATC:CC:DWPT?
> EXCL
```

## 2.4.22 CC DwPTS for Unwanted Emissions

### :CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs:UWEMissions INCLude|EXCLude

CC DwPTS for Unwanted Emissions

Function

This commands sets whether to include/exclude CC DwPTS for Unwanted Emissions.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs:UWEMissions <mode>
```

Parameter

| | |
|---|---|
| <mode> | CC DwPTS for Unwanted Emissions |
| INCLude | CC DwPTS for Unwanted Emissions is included. |
| EXCLude | CC DwPTS for Unwanted Emissions is excluded. (Default) |

Example of Use

To exclude CC DwPTS for Unwanted Emissions.

```
CALC:BATC:CC:DWPT:UWEM EXCL
```

### :CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs for Unwanted Emissions?

CC DwPTS for Unwanted Emissions Query

Function

This commands queries whether to include/exclude DwPTS for Unwanted Emissions.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:DWPTs:UWEMissions?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | CC DwPTS for Unwanted Emissions |
| INCL | CC DwPTS for Unwanted Emissions is included. |
| EXCL | CC DwPTS for Unwanted Emissions is excluded. |

Example of Use

To query CC DwPTS setting for Unwanted Emissions.

```
CALC:BATC:CC:DWPT:UWEM?
> EXCL
```

## 2.4.23 CC Measurement Filter Type

:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter NORMal|NARRow

CC Measurement Filter Type

Function

This command sets the filter type for the CC used for modulation analysis.

***Note:***

This function is not available for Mean Power and Output Power measurements.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter <mode>
```

Parameter

| | |
|---|---|
| <mode> | Filter type |
| NORMal | Use this when measuring single carrier signal. (Default) |
| NARRow | Use this when measuring multi-carrier signal. |

Details

This command is fixed NORMal when Band is set to Contiguous.

Example of Use

To set the Measurement Filter Type of the CC0 for multi-carrier measurement.

```
CALC:BATC:CC:MFIL NARR
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:MFILter?

CC Measurement Filter Type Query

### Function

This command queries the filter type for the CC used for modulation analysis.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Filter type |
| `NORM` | For measuring single carrier signal. |
| `NARR` | For measuring multi-carrier signal. |

### Details

This command is fixed `NORMal` when Band is set to Contiguous.

### Example of Use

To query the Measurement Filter Type for the CC0

```
CALC:BATC:CC:MFIL NARR?
> NARR
```

### 2.4.24 Setting CC PBCH

:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe] OFF|ON|0|1

CC PBCH On/Off

Function

This command sets whether to include (On) or exclude (Off) PBCH for the CC as the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe] <switch>
```

Parameter

| | |
|---|---|
| <switch> | CC PBCH On/Off |
| OFF\|0 | Off |
| ON\|1 | On (Default) |

Details

This command is available when CC Test Model is set to Off.

Example of Use

To configure a setting to include PBCH for the CC.

```
CALC:BATC:CC:PBCH ON
```

:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe]?

CC PBCH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PBCH for the CC as the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | PBCH On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the setting for PBCH of the CC0.

```
CALC:BATC:CC:PBCH?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO OFF|ON|0|1

CC PBCH Power Auto

Function

This command enables or disables automatic detection of PBCH power for the CC.

Command

`:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO <switch>`

Parameter

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

Details

This command is not available when CC PBCH is set to Off.

This command is available when CC Test Model is set to Off.

Example of Use

To enable automatic detection of PBCH power for the CC0.

```
CALC:BATC:CC:PBCH:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO?

CC PBCH Power Auto Query

Function

This command queries whether automatic detection of PBCH power for the CC is enabled.

Query

`:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO?`

Response

`<switch>`

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PBCH power for the CC0 is enabled.

```
CALC:BATC:CC:PBCH:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting <rel_power>

CC PBCH Power Boosting

### Function

This command sets the PBCH boosting level for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PBCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to Off, CC PBCH is set to On and CC PBCH Power Auto is set to Off.

### Example of Use

To set the PBCH boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PBCH:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting?

CC PBCH Power Boosting Query

### Function

This command queries the PBCH boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PBCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the PBCH boosting level for the CC0.

```
CALC:BATC:CC:PBCH:POW:BOOS?
> 10.000
```

## 2.4.25 Setting CC Primary Synchronization Signal

:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe] OFF|ON|0|1

CC P-SS On/Off

Function

This command sets whether to include (On) or exclude (Off) Primary Synchronization Signal for the CC as the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC P-SS On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when CC Synchronization Mode is set to Reference Signal.
This command is fixed On when CC Synchronization Mode is set to Synchronization Signal.

Example of Use

To configure a setting to include Primary Synchronization Signal for the CC0.

```
CALC:BATC:CC:PSS ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe]?

CC P-SS On/Off Query

Function

This command queries whether to include (On) or exclude (Off) Primary Synchronization Signal for the CC as the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC P-SS On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the setting for Primary Synchronization Signal of the CC0.

```
CALC:BATC:CC:PSS?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO OFF|ON|0|1

CC P-SS Power Auto

Function

This command enables or disables automatic detection of primary synchronization signal power for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO <switch>
```

Parameter

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

Details

This command is available when CC Test Model is set to Off and CC Primary Synchronization Signal is set to On.

Example of Use

To enable automatic detection of primary synchronization signal power for the CC0.

```
CALC:BATC:CC:PSS:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO?

CC P-SS Power Auto Query

### Function

This command queries whether automatic detection of primary synchronization signal power for the CC within the measurement target is enabled.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of primary synchronization signal power for the CC0 is enabled.

```
CALC:BATC:CC:PSS:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting <rel_power>

CC P-SS Power Boosting



### Function

This command sets the primary synchronization signal boosting level for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC P-SS boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to Off, CC P-SS is set to On and when CC P-SS Power Auto is set to Off.

### Example of Use

To set the primary synchronization signal boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PSS:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting?

CC P-SS Power Boosting Query

### Function

This command queries the primary synchronization signal boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC P-SS boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the primary synchronization signal boosting level for the CC0.

```
CALC:BATC:CC:PSS:POW:BOOS?
> 10.000
```

## 2.4.26 Setting CC Secondary Synchronization Signal

:CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe] OFF|ON|0|1

CC S-SS On/Off

Function

This command sets whether to include (On) or exclude (Off) Secondary Synchronization Signal for the CC as the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC S-SS On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when CC Synchronization Mode is set to Reference Signal.
This command is fixed On when CC Synchronization Mode is set to Synchronization Signal.

Example of Use

To configure a setting to include Secondary Synchronization Signal for the CC0 as the measurement target.

```
CALC:BATC:CC:SSS ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe]?

CC S-SS On/Off Query

### Function

This command queries whether to include (On) or exclude (Off) Secondary Synchronization Signal for the CC as the measurement target.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe]?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | CC S-SS On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query the setting for Secondary Synchronization Signal for the CC0.

```
CALC:BATC:CC:SSS?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:AUTO OFF|ON|0|1

CC S-SS Power Auto

### Function

This command enables or disables automatic detection of secondary synchronization signal power for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:AUTO <switch>
```

### Parameter

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

### Details

This command is available when CC Test Model is set to Off and CC S-SS is set to Off.

### Example of Use

To enable automatic detection of secondary synchronization signal power for the CC0.

```
CALC:BATC:CC:SSS:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:AUTO?

CC S-SS Power Auto Query

### Function

This command queries whether automatic detection of secondary synchronization signal power for the CC within the measurement target is enabled.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of secondary synchronization signal power for the CC0 is enabled.

```
CALC:BATC:CC:SSS:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:BOOSting <rel_power>

CC S-SS Power Boosting

**Function**

This command sets the secondary synchronization signal boosting level for the CC.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:BOOSting
<rel_power>
```

**Parameter**

| | |
|---|---|
| `<rel_power>` | CC S-SS boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default | 0 dB |

**Details**

This command is available when CC Test Model is set to Off, CC S-SS is set to On and CC S-SS Power Auto is set to Off.

**Example of Use**

To set the secondary synchronization signal boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:SSS:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:BOOSting?

CC S-SS Power Boosting Query

### Function

This command queries the secondary synchronization signal boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:SSS:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC S-SS boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the secondary synchronization signal boosting level for the CC0.

```
CALC:BATC:CC:SSS:POW:BOOS?
> 10.000
```

## 2.4.27 Setting CC PDCCH

:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh[:STATe] OFF|ON|0|1

CC PDCCH On/Off

Function

This command sets whether to include (On) or exclude (Off) PDCCH of the CC for the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh[:STATe] <switch>
```

Parameter

| | |
|---|---|
| <switch> | CC PDCCH On/Off |
| OFF\|0 | Off |
| ON\|1 | On (Default) |

Details

This command is available when CC Test Model is set to Off.

Example of Use

To configure a setting to include PDCCH of the CC0 as the measurement target.

```
CALC:BATC:CC:PDCC ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh[:STATe]?

CC PDCCH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PDCCH of the CC for the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC PDCCH On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the setting for PDCCH of the CC0.

```
CALC:BATC:CC:PDCC?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:AUTO OFF|ON|0|1

CC PDCCH Power Auto

**Function**

This command enables or disables automatic detection of PDCCH power for the CC.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:AUTO <switch>
```

**Parameter**

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

**Details**

This command is available when CC Test Model is set to Off and CC PDCCH is set to On.

**Example of Use**

To enable automatic detection of PDCCH power for the CC0.

```
CALC:BATC:CC:PDCC:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:AUTO?

CC PDCCH Power Auto Query

**Function**

This command queries whether automatic detection of PDCCH power for the CC is enabled.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:AUTO?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

**Example of Use**

To query whether automatic detection of PDCCH power for the CC0 is enabled.

```
CALC:BATC:CC:PDCC:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:BOOSting <rel_power>

CC PDCCH Power Boosting

### Function

This command sets the PDCCH boosting level for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PDCCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | `DB`<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to Off, CC PDCCH is set to On and CC PDCCH Power Auto is set to Off.

This command is available when CC Test Model is set to Off.

### Example of Use

To set the PDCCH boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PDCC:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:BOOSting?

CC PDCCH Power Boosting Query

### Function

This command queries the PDCCH boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| <rel_power> | CC PDCCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the PDCCH boosting level for the CC0.

```
CALC:BATC:CC:PDCC:POW:BOOS?
> 10.000
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:AUTO OFF|ON|0|1

Number of CC PDCCH Symbol Auto

### Function

This command enables or disables automatic detection of PDCCH symbol count for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:AUTO <switch>
```

### Parameter

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

### Details

This command is available when CC Test Model is set to Off, CC PCFICH is set to On and CC PDCCH is set to On.

### Example of Use

To enable automatic detection of PDCCH symbol count for the CC0.

```
CALC:BATC:CC:PDCC:SYMB:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:AUTO?

Number of CC PDCCH Symbol Auto Query

Function

This command queries whether automatic detection of PDCCH symbol count for the CC is enabled.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query whether automatic detection of PDCCH symbol count for the CC0 is enabled.

```
CALC:BATC:CC:PDCC:SYMB:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:SFRame1|6:NUMBer <integer>

CC Number of PDCCH Symbol for Subframe 1 and 6

### Function

This command sets the number of symbols for CC PDCCH, at Subframe 1 and 6.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:SFRame1|6:NUMBer <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When Channel Bandwidth is 1.4 MHz,<br>2<br>When Channel Bandwidth is not 1.4 MHz,<br>1 or 2 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Details

This command is available when CC Number of PDCCH Symbols Auto is Off.

### Example of Use

To set the number of symbols for CC PDCCH of CC0 to 1, at Subframe 1 and 6.

```
CALC:BATC:CC:PDCC:SYMB:SFR1:NUMB 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:SFRame1|6:NUMBer?

CC Number of PDCCH Symbol for Subframe 1 and 6 Query

### Function

This command queries the number of symbols for CC PDCCH, at Subframe 1 and 6.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:SFRame1|6:NUMBer?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| <integer> | Number of symbols |
| Range | When Channel Bandwidth is 1.4 MHz,<br>2<br>When Channel Bandwidth is not 1.4 MHz,<br>1 or 2 |
| Resolution | 1 |

### Example of Use

To query the number of symbols for CC PDCCH of CC0.

```
CALC:BATC:CC:PDCC:SYMB:SFR1:NUMB?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:NUMBer <integer>

Number of CC PDCCH Symbol

### Function

This command sets the number of symbols for PDCCH of the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:NUMBer
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When CC Channel Bandwidth is set to 1.4 MHz:<br>2 to 4<br>When CC Channel Bandwidth is set to other than 1.4 MHz:<br>1 to 3 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Details

This command is available when CC Number of PDCCH Symbols Auto is set to Off.

### Example of Use

To set 1 as the number of symbols for PDCCH of the CC0.

```
CALC:BATC:CC:PDCC:SYMB:NUMB 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:NUMBer?

Number of CC PDCCH Symbol Query

### Function

This command queries the number of symbols for PDCCH of the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol:NUMBer?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of symbols |
| Range | When CC Channel Bandwidth is set to 1.4 MHz:<br>2 to 4<br>When CC Channel Bandwidth is set to other than 1.4 MHz:<br>1 to 3 |
| Resolution | 1 |

### Example of Use

To query the number of symbols for PDCCH of the CC0.

```
CALC:BATC:CC:PDCC:SYMB:NUMB?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing AUTO|EASY

CC PDCCH Mapping

### Function

This command sets the CC PDCCH mapping specification method.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing <mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | CC PDCCH Mapping specification method |
| `AUTO` | Auto detection (Default) |
| `EASY` | Performs measurement according to the specified CC PDCCH format and the number of CC PDCCHs. |

### Details

This command is available when CC Test Model is set to Off and CC PDCCH is set to On.

### Example of Use

To set the CC PDCCH mapping specification method for the CC0 to AUTO.

```
CALC:BATC:CC:PDCC:MAPP AUTO
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing?

CC PDCCH Mapping Query

**Function**

This command queries the CC PDCCH mapping specification method.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | CC PDCCH Mapping specification method |
| `AUTO` | Auto detection |
| `EASY` | Performs measurement according to the specified CC PDCCH format and the number of CC PDCCHs. |

**Example of Use**

To query the CC PDCCH mapping specification method.

```
CALC:BATC:CC:PDCC:MAPP?
> AUTO
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:FORMat 0|1|2|3

CC PDCCH Format

Function

This command sets the PDCCH format for the CC.

Command

`:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:FORMat <mode>`

Parameter

| | | |
|---|---|---|
| <mode> | | CC PDCCH Format |
| | Range | 0, 1, 2, 3 |
| | Default | 0 |

Details

This command is available when CC Test Model is set to Off, CC PDCCH is set to On and CC PDCCH Mapping is set to Easy.

Example of Use

To set the PDCCH format for the CC0 to 1.

```
CALC:BATC:CC:PDCC:MAPP:EASY:FORM 1
```

## :CALCulate:EVM:PDCCh:MAPPing:EASY:FORMat?

CC PDCCH Format Query

Function

This command queries the PDCCH format for the CC.

Query

`:CALCulate:EVM:PDCCh:MAPPing:EASY:FORMat?`

Response

| | | |
|---|---|---|
| <mode> | | CC PDCCH Format |
| | Range | 0, 1, 2, 3 |
| | Resolution | 1 |

Example of Use

To query the PDCCH format for the CC0.

```
CALC:BATC:CC:PDCC:MAPP:EASY:FORM?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer <integer>

CC Number of PDCCHs

### Function

This command sets the number of CC PDCCH for 1 subframe.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBe
r <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Number of CC PDCCHs |
| Range | 1 to 88 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

### Details

This command is available when CC Test Model is set to Off, CC PDCCH is set to On and CC PDCCH Mapping is set to Easy.

### Example of Use

To set 1 as the number of CC PDCCHs for the CC0 .

```
CALC:BATC:CC:PDCC:MAPP:EASY:NUMB 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer?

CC Number of PDCCHs Query

### Function

This command queries the number of CC PDCCH for 1 subframe.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer
?
```

### Response

`<integer>` Number of CC PDCCHs

Range 1 to 88

Resolution 1

### Example of Use

To query the number of CC PDCCHs for the CC0.

```
CALC:BATC:CC:PDCC:MAPP:EASY:NUMB?
> 1
```

## 2.4.28 Setting CC PCFICH

### :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe] OFF|ON|0|1

CC PCFICH On/Off

**Function**

This command sets whether to include (On) or exclude (Off) PCFICH of the CC for the measurement target.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe] <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | CC PCFICH On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

**Details**

This command is available when CC Test Model is set to Off.

**Example of Use**

To configure a setting to include PCFICH of the CC0 as the measurement target.

```
CALC:BATC:CC:PCF ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe]?

CC PCFICH On/Off Query

Function

This command queries whether to include (On) or exclude (Off) PCFICH of the CC for the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC PCFICH On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting for PCFICH of the CC0.

```
CALC:BATC:CC:PCF?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO OFF|ON|0|1

CC PCFICH Power Auto

Function

This command enables or disables automatic detection of PCFICH power for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO
<switch>
```

Parameter

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

Details

This command is available when CC Test Model is set to Off and CC PCFICH is set to On.

Example of Use

To enable automatic detection of PCFICH power for the CC0.

```
CALC:BATC:CC:PCF:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO?

CC PCFICH Power Auto Query

Function

This command queries whether automatic detection of PCFICH power for the CC is enabled.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PCFICH power for the CC0 is enabled.

```
CALC:BATC:CC:PCF:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting <rel_power>

CC PCFICH Power Boosting

### Function

This command sets the PCFICH boosting level for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PCFICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to Off, CC PCFICH is set to On and CC PCFICH Power Auto is set to Off.

### Example of Use

To set the PCFICH boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PCF:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting?

CC PCFICH Power Boosting Query

### Function

This command queries the PCFICH boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PCFich:POWer:BOOSting?
```

### Response

```
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PCFICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the PCFICH boosting level for the CC0.

```
CALC:BATC:CC:PCF:POW:BOOS?
> 10.000
```

## 2.4.29 Setting CC PHICH

:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe] OFF|ON|0|1

CC PHICH On/Off

Function

This command sets whether to include (On) or exclude (Off) PHICH of the CC for the measurement target.

Command

`:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe] <switch>`

Parameter

| | |
|---|---|
| `<switch>` | CC PHICH On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This command is available when CC Test Model is set to Off.

Example of Use

To configure a setting to include PHICH of the CC0 as the measurement target.

```
CALC:BATC:CC:PHIC ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe]?

CC PHICH On/Off Query

### Function

This command queries whether to include (On) or exclude (Off) PHICH of the CC for the measurement target.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh[:STATe]?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | CC PHICH On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query the setting for PHICH of the CC0.

```
CALC:BATC:CC:PHIC?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO OFF|ON|0|1

CC PHICH Power Auto

### Function

This command enables or disables automatic detection of PHICH power for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO <switch>
```

### Parameter

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

### Details

This command is available when CC Test Model is set to Off and CC PHICH is set to On.

### Example of Use

To enable automatic detection of PHICH power for the CC0.

```
CALC:BATC:CC:PHIC:POW:AUTO ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO?

CC PHICH Power Auto Query

### Function

This command queries whether automatic detection of PHICH power for the CC is enabled.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:AUTO?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query whether automatic detection of PHICH power for the CC0 is enabled.

```
CALC:BATC:CC:PHIC:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting <rel_power>

CC PHICH Power Boosting

**Function**

This command sets the PHICH boosting level for the CC.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting
<rel_power>
```

**Parameter**

| | |
|---|---|
| `<rel_power>` | CC PHICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | `DB`<br>dB is used when omitted. |
| Default | 0 dB |

**Details**

This command is available when CC Test Model is set to Off, CC PHICH is set to On and CC PHICH Power Auto is set to Off.

**Example of Use**

To set the PHICH boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PHIC:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting?

CC PHICH Power Boosting Query

**Function**

This command queries the PHICH boosting level for the CC.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:POWer:BOOSting?
```

**Response**

```
<rel_power>
```

**Parameter**

| | |
|---|---|
| `<rel_power>` | CC PHICH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

**Example of Use**

To query the PHICH boosting level for the CC0.

```
CALC:BATC:CC:PHIC:POW:BOOS?
> 10.000
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:MI1 OFF|ON|0|1

CC PHICH TDD m_i=1 (E-TM)

**Function**

This command sets the mi of CC PHICH.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:MI1 <switch>
```

**Parameter**

| | |
|---|---|
| <switch> | mi of CC PHICH |
| OFF\|0 | Value defined in 3GPP TS36.211 (Default) |
| ON\|1 | 1 for all subframes |

**Details**

This command is available when CC Test Model is set to Off. Fixed to On if the CC Test Model is not Off,

**Example of Use**

To set the mi of CC PHICH of the CC0 to On.

```
CALC:BATC:CC:PHIC:MI1 ON
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:MI1?

CC PHICH TDD m_i=1 (E-TM) Query

**Function**

This command queries the mi of CC PHICH.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:MI1?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| <switch> | mi of CC PHICH |
| OFF\|0 | Value defined in 3GPP TS36.211 |
| ON\|1 | 1 for all subframes |

**Example of Use**

To query the mi of CC PHICH of the CC0.

```
CALC:BATC:CC:PHIC:MI1?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG R1BY6|R1BY2|R1|R2

CC PHICH Ng

Function

This command sets Ng of CC PHICH.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG <mode>
```

Parameter

| | |
|---|---|
| <mode> | Ng of CC PHICH |
| R1BY6 | Ng 1/6 (Default) |
| R1BY2 | Ng 1/2 |
| R1 | Ng 1 |
| R2 | Ng 2 |

Details

This command is available when CC Test Model is set to Off and CC PHICH is set to On.

Example of Use

To set Ng of CC PHICH for the CC0 to 1.

```
CALC:BATC:CC:PHIC:NG R1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG?

CC PHICH Ng Query

Function

This command queries Ng of CC PHICH.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:NG?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Ng of CC PHICH |
| R1BY6 | Ng 1/6 |
| R1BY2 | Ng 1/2 |
| R1 | Ng 1 |
| R2 | Ng 2 |

Example of Use

To query Ng of CC PHICH for the CC0.

```
CALC:BATC:CC:PHIC:NG?
> R1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation NORMal|EXTended

CC PHICH Duration

**Function**

This command sets the PHICH duration for the CC.

**Command**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation <mode>
```

**Parameter**

| | |
|---|---|
| <mode> | CC PHICH Duration |
| NORMal | Normal (Default) |
| EXTended | Extended |

**Details**

This command is available when CC Test Model is Off and CC PHICH is set to On.

**Example of Use**

To set the PHICH duration for the CC0 to Normal.

```
CALC:BATC:CC:PHIC:DUR NORM
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation?

CC PHICH Duration Query

**Function**

This command queries the PHICH duration for the CC.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PHICh:DURation?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | CC PHICH Duration |
| NORM | Normal |
| EXT | Extended |

**Example of Use**

To query the PHICH duration for the CC0.

```
CALC:BATC:CC:PHIC:DUR?
> NORM
```

## 2.4.30 Setting CC PDSCH

### :CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO OFF|ON|0|1

CC PDSCH Power Auto

Function

This command enables or disables automatic detection of PDSCH power for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO <switch>
```

Parameter

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

Details

This command is available when CC Test Model is set to Off and when CC PDSCH Modulation Scheme is NOT set to AUTO.

Example of Use

To enable automatic detection of PDSCH power for the CC0.

```
CALC:BATC:CC:PDSC:POW:AUTO ON
```

### :CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO?

CC PDSCH Power Auto Query

Function

This command queries whether automatic detection of PDSCH power for the CC within the target measurement is enabled.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether automatic detection of PDSCH power for the CC0 is enabled.

```
CALC:BATC:CC:PDSC:POW:AUTO?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting <rel_power>

CC PDSCH Power Boosting

### Function

This command sets the PDSCH boosting level for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting
<rel_power>
```

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PDSCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |
| Suffix code | DB<br>dB is used when omitted. |
| Default | 0 dB |

### Details

This command is available when CC Test Model is set to On and CC PDSCH Power Auto is set to Off.

### Example of Use

To set the PDSCH boosting level for the CC0 to +10 dB.

```
CALC:BATC:CC:PDSC:POW:BOOS 10
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting?

CC PDSCH Power Boosting Query

### Function

This command queries the PDSCH boosting level for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:POWer:BOOSting?
```

### Response

`<rel_power>`

### Parameter

| | |
|---|---|
| `<rel_power>` | CC PDSCH boosting level |
| Range | –20.000 to +20.000 dB |
| Resolution | 0.001 dB |

### Example of Use

To query the PDSCH boosting level for the CC0.

```
CALC:BATC:CC:PDSC:POW:BOOS?
> 10.000
```

## 2.4.31 Batch Modulation Analysis

### [:SENSe]:BATCh:EVM[:STATe] OFF|ON|0|1

Batch Modulation Analysis

**Function**

This command sets the Modulation Analysis to On/Off.

**Command**

```
[:SENSe]:BATCh:EVM[:STATe] <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | On/Off |
| `OFF|0` | Off |
| `ON|1` | On |
| Default | `ON` |

**Example of Use**

To set the Modulation Analysis to On.

```
BATC:EVM ON
```

### [:SENSe]:BATCh:EVM[:STATe]?

Batch Modulation Analysis Query

**Function**

This command queries the On/Off status of the Modulation Analysis.

**Query**

```
[:SENSe]:BATCh:EVM[:STATe]?
```

**Response**

```
<switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

**Example of Use**

To query the On/Off status of the Modulation Analysis.

```
BATC:EVM?
> 1
```

## 2.4.32 Batch OBW

### [:SENSe]:BATCh:OBW[:STATe] OFF|ON|0|1

Batch OBW

Function

This command sets the OBW measurement to On/Off.

Command

```
[:SENSe]:BATCh:OBW[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `OFF|0` | Off |
| `ON|1` | On |
| Default | `ON` |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To set the OBW measurement to On.

```
BATC:OBW ON
```

### [:SENSe]:BATCh:OBW[:STATe]?

Batch OBW Query

Function

This command queries the On/Off status of the OBW measurement.

Query

```
[:SENSe]:BATCh:OBW[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To query the On/Off status of the OBW measurement.

```
BATC:OBW?
> 1
```

## 2.4.33 Batch ACLR

### [:SENSe]:BATCh:ACLR[:STATe] OFF|ON|0|1

Batch ACLR

Function

This command sets the ACLR measurement to On/Off.

Command

`[:SENSe]:BATCh:ACLR[:STATe] <switch>`

Parameter

| | |
|---|---|
| <switch> | On/Off |
| OFF\|0 | Off |
| ON\|1 | On |
| Default | ON |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To set the ACLR measurement to On.

```
BATC:ACLR ON
```

### [:SENSe]:BATCh:ACLR[:STATe]?

Batch ACLR Query

Function

This command queries the On/Off status of the ACLR measurement.

Query

`[:SENSe]:BATCh:ACLR[:STATe]?`

Response

`<switch>`

Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To query the On/Off status of the ACLR measurement.

```
BATC:ACLR?
> 1
```

## 2.4.34 Batch OBUE

### [:SENSe]:BATCh:OBUE[:STATe] OFF|ON|0|1

Batch OBUE

Function

This command sets the OBUE (Operating Band Unwanted Emissions) measurement to On/Off.

Command

```
[:SENSe]:BATCh:OBUE[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `OFF|0` | Off |
| `ON|1` | On |
| Default | `ON` |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To set the OBUE measurement to On.

```
BATC:OBUE ON
```

### [:SENSe]:BATCh:OBUE[:STATe]?

Batch OBUE Query

Function

This command queries the On/Off status of the OBUE measurement.

Query

```
[:SENSe]:BATCh:OBUE[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Details

The measurement is not executed if the required frequency bandwidth exceeds the analysis bandwidth.

Example of Use

To query the On/Off status of the OBUE measurement.

```
BATC:OBUE?
> 1
```

### 2.4.35 Batch Measurement Band

## [:SENSe]:BATCh:BAND[0]|1|2[:STATe] OFF|ON|0|1

Batch Measure Band

Function

This command sets the specified Band measurement to On/Off.

Command

`[:SENSe]:BATCh:BAND[0]|1|2[:STATe] <switch>`

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `OFF|0` | Off |
| `ON|1` | On |
| Default | `ON` (Band0) |
| | `OFF` (Band1, 2) |

Details

Band1 and 2 are available when the MX269022A-001 is installed. However, they are unavailable if the MS2830A-078 is installed.

Example of Use

To set the Band0 measurement to On.

```
BATC:BAND ON
```

## [:SENSe]:BATCh:BAND[0]|1|2[:STATe]?

Batch Measure Band Query

Function

This command queries the On/Off status of the specified Band measurement.

Query

`[:SENSe]:BATCh:BAND[0]|1|2[:STATe]?`

Response

`<switch>`

Parameter

| | |
|---|---|
| `<switch>` | On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the On/Off status of the Band0 measurement.

```
BATC:BAND?
> 1
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe] OFF|ON|0|1

Batch Measure CC

### Function

This command sets the specified CC measurement to On/Off.

### Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe] <switch>
```

### Parameter

| | |
|---|---|
| <switch> | On/Off |
| OFF\|0 | Off |
| ON\|1 | On |

Default

When the MX269022A-001 is installed, and MS269xA-004/104/078/178 or MS2830A-078 are installed.

| | |
|---|---|
| CC0 | ON |
| CC1,2,3,4 | OFF |

When the MX269022A-001 is installed, but the MS269xA-004/104/078/178 or MS2830A-078 is not installed,

| | |
|---|---|
| CC0,1,2 | ON fixed |
| CC3,4 | OFF fixed |

When the MX269022A-001 is not installed,

| | |
|---|---|
| CC0 | ON fixed |
| CC1,2,3,4 | OFF fixed |

### Example of Use

To set the CC0 measurement to On.

```
BATC:CC ON
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe]?

Batch Measure CC Query

### Function

This command queries the On/Off status of the specified CC measurement.

### Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe]?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | On/Off |
| 0 | Off |
| 1 | On |

### Example of Use

To query the On/Off status of the CC0 measurement.

```
BATC:CC?
> 1
```

## 2.4.36 Band Contiguous Mode

### [:SENSe]:BATCh:BAND[0]|1|2[:STATe] OFF|ON|0|1

Band Contiguous Mode

Function

This command sets the band to Contiguous/Non-contiguous.

Command

```
[:SENSe]:BATCh:BAND[0]|1|2:CONTiguous <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Contiguous/Non-Contiguous |
| `OFF|0` | Non-Contiguous (Default) |
| `ON|1` | Contiguous |

Details

This setting is available only when the MX269022A-001 and, MS269xA-004/104/078/178 or MS2830A-078/178 are installed. If they are not installed, it is fixed to Off.

Example of Use

To set Band0 to Contiguous.

```
BATC:BAND:CONT ON
```

### [:SENSe]:BATCh:BAND[0]|1|2:CONTiguous?

Band Contiguous Mode Query

Function

This command queries the band Contiguous/Non-contiguous setting.

Query

```
[:SENSe]:BATCh:BAND[0]|1|2:CONTiguous?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Contiguous/Non-Contiguous |
| `0` | Non-Contiguous |
| `1` | Contiguous |

Example of Use

To query the Band0 Contiguous/Non-contiguous setting.

```
BATC:BAND:CONT?
> 1
```

### 2.4.37 Band OBUE Standard

[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard WIDE_A_U1G|WIDE_A_O1G_U3G|WIDE_A_O3G|WIDE_B1_U1G|WIDE_B1_O1G_U3G|WIDE_B1_O3G|WIDE_B2|LOCAL_U3G|LOCAL_O3G|HOME_U3G|HOME_O3G

Band OBUE Standard





Function

This command sets the standard template for OBUE measurement.

Command

```
[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard <mode>
```

Parameter

| | |
|---|---|
| <mode> | Template of the OBUE measurement |
| WIDE_A_U1G | Wide Area BS Category A <1G (Default) |
| WIDE_A_O1G_U3G | Wide Area BS Category A 1-3G |
| WIDE_A_O3G | Wide Area BS Category A >3G |
| WIDE_B1_U1G | Wide Area BS Category B Option 1 <1G |
| WIDE_B1_O1G_U3G | Wide Area BS Category B Option 1 1-3G |
| WIDE_B1_O3G | Wide Area BS Category B Option 1 >3G |
| WIDE_B2 | Wide Area BS Category B Option 2 |
| LOCAL_U3G | Local Area BS ≤3G |
| LOCAL_O3G | Local Area BS >3G |
| HOME_U3G | Home BS ≤3G |
| HOME_O3G | Home BS >3G |

Example of Use

To set the standard template for OBUE measurement of Band0 to Home BS <3G.

```
BATC:BAND:OBUE:STAN HOME_U3G
```

## [:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard?

Band OBUE Standard Query

### Function

This command queries the standard template for OBUE measurement.

### Query

```
[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| <mode> | Template of the OBUE measurement |
| `WIDE_A_U1G` | Wide Area BS Category A <1G |
| `WIDE_A_O1G_U3G` | Wide Area BS Category A 1-3G |
| `WIDE_A_O3G` | Wide Area BS Category A >3G |
| `WIDE_B1_U1G` | Wide Area BS Category B Option 1 <1G |
| `WIDE_B1_O1G_U3G` | Wide Area BS Category B Option 1 1-3G |
| `WIDE_B1_O3G` | Wide Area BS Category B Option 1 >3G |
| `WIDE_B2` | Wide Area BS Category B Option 2 |
| `LOCAL_U3G` | Local Area BS ≤3G |
| `LOCAL_O3G` | Local Area BS >3G |
| `HOME_U3G` | Home BS ≤3G |
| `HOME_O3G` | Home BS >3G |

### Example of Use

To query the standard template for OBUE measurement of Band0.

```
BATC:BAND:OBUE:STAN?
> HOME_U3G
```

## 2.4.38 Band OBUE Standard Additional

### [:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional WIDEBS_A|WIDEBS_B1|WIDEBS_B2|LOCALBS|HOMEBS

Band OBUE Standard Additional

Function

This command sets the additional standard template for OBUE measurement.

Command

```
[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional
<mode>
```

Parameter

| <mode> | Template |
|---|---|
| OFF | Not use the additional standard template (Default) |
| 2 | Band 2,4,10,23,25,35,36,41 |

Example of Use

To set the additional standard template for OBUE measurement of Band0 to OFF.

```
BATC:BAND:OBUE:STAN:ADD OFF
```

### [:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional?

Band OBUE Standard Additional Query

Function

This command queries the additional standard template for OBUE measurement.

Query

```
[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional?
```

Response

```
<mode>
```

Parameter

| <mode> | Template |
|---|---|
| OFF | Not use the additional standard template (Default) |
| 2 | Band 2,4,10,23,25,35,36,41 |

Example of Use

To query the additional standard template for OBUE measurement of Band0.

```
BATC:BAND:OBUE:STAN:ADD?
> OFF
```

## 2.4.39 CC Frequency Band

### [:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND 0|1|2

CC Frequency Band

Function

This command sets the band of the CC .

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND <mode>
```

Parameter

| <mode> | Band |
|---|---|
| 0 | Band0 |
| 1 | Band1 |
| 2 | Band2 |
| Default | 0 |

Details

When the MX269022A-001 is not installed, it is fixed to Band 0.

When MS2830A-078 is installed, it is fixed to Band 0.

Example of Use

To set CC0 to Band1.

```
BATC:CC:FREQ:BAND 1
```

### [:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND?

CC Frequency Band Query

Function

This command queries the band of the CC.

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND?
```

Response

```
<mode>
```

Parameter

| <mode> | Band |
|---|---|
| 0 | Band0 |
| 1 | Band1 |
| 2 | Band2 |

Example of Use

To query the band of CC0.

```
BATC:CC:FREQ:BAND?
> 1
```

## 2.4.40 CC Frequency Offset

### [:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet <freq>

CC Frequency Offset

**Function**

This command sets the center frequency of the CC with the relative value from the center frequency of the band.

**Command**

```
[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet <freq>
```

**Parameter**

`<freq>` Center frequency of the CC (Relative value)

Range ± ((100 MHz – CC Channel Bandwidth)/2)
(When MS269xA-004/104/078/178 or MS2830A-078 are installed.)
± ((31.25MHz–CC Channel Bandwidth)/2)
(When MS269xA-004/104/078/178 or MS2830A-078 are not installed.)

Resolution 300 kHz
(When Band Settings: Contiguous Mode is set to On.)
1 Hz
(When Band Settings: Contiguous Mode is set to Off.)

Suffix code `HZ`,`KHZ`,`KZ`,`MHZ`,`MZ`,`GHZ`,`GZ`
Hz is used when omitted.

Default 0 Hz

**Details**

This setting is available when the MX269022A-001.

**Example of Use**

To set the center frequency of CC0 to 5 MHz.

```
BATC:CC:FREQ:OFFS 5MHZ
```

## [:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet?

CC Frequency Offset Query

### Function

This command queries the center frequency of the CC with the relative value from the center frequency of the band.

### Query

`[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet?`

### Response

`<freq>`

### Parameter

`<freq>` Center frequency of the CC (Relative value)

Range ± ((100 MHz – CC Channel Bandwidth)/2)
(When MS269xA-004/104/078/178 or MS2830A-078 are installed.)
± ((31.25MHz–CC Channel Bandwidth)/2)
(When MS269xA-004/104/078/178 or MS2830A-078 are not installed.)

Resolution 300 kHz
(When Band Settings: Contiguous Mode is set to On.)
1 Hz
(When Band Settings: Contiguous Mode is set to Off.)

Value is returned in Hz units.

### Example of Use

To query the center frequency (Relative value) of CC0.

```
BATC:CC:FREQ:OFFS?
> 5000000
```

### 2.4.41 Setting CC CSI-RS

#### :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe] OFF|ON|0|1

CC CSI-RS On/Off

Function

This command sets whether to include (On) or exclude (Off) CSI-RS for the CC as the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe] <switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC CSI-RS On/Off |
| `OFF|0` | Off |
| `ON|1` | On (Default) |

Details

This can be set only when MX269022A-001 is installed.
This command is available when CC Test Model is set to Off.

Example of Use

To configure a setting to include PBCH for the CC0.

```
CALC:BATC:CC:CSIR ON
```

#### :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe]?

CC CSI-RS On/Off Query

Function

This command queries whether to include (On) or exclude (Off) CSI-RS for the CC as the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | CC CSI-RS On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the setting for CSI-RS of the CC0.

```
CALC:BATC:CC:CSIR?
> 1
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig <integer>

CC CSI-RS Configuration

### Function

This command sets the CSI-RS configuration for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig <integer>
```

### Parameter

| | | |
|---|---|---|
| `<integer>` | | CSI-RS configuration |
| | Range | When CC CSI-RS Number of Antenna Ports is 8 : 0 to 4, 20 to 22<br>When CC CSI-RS Number of Antenna Ports is 4 : 0 to 9, 20 to 25<br>When CC CSI-RS Number of Antenna Ports is 1 or 2 : 0 to 31 |
| | Resolution | 1 |
| | Suffix code | None |
| | Default | 0 |

### Details

This command is available when the MX269022A-001 is installed and CC CSI-RS is set to On.

### Example of Use

To set the CSI-RS configuration for the CC0 to 2.

```
CALC:BATC:CC:CSIR:CONF 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig?

CC CSI-RS Configuration Query

### Function

This command queries the CSI-RS configuration for the CC.

### Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | CSI-RS configuration |
| Range | When CC CSI-RS Number of Antenna Ports is 8 : 0 to 4, 20 to 22 |
| | When CC CSI-RS Number of Antenna Ports is 4 : 0 to 9, 20 to 25 |
| | When CC CSI-RS Number of Antenna Ports is 1 or 2 : 0 to 31 |
| Resolution | 1 |

### Example of Use

To query the CSI-RS configuration for the CC0.

```
CALC:BATC:CC:CSIR:CONF?
> 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity 5|10

CC CSI-RS Periodicity T

Function

This command sets the CSI-RS periodicity for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity <mode>
```

Parameter

| | |
|---|---|
| <mode> | CSI-RS periodicity |
| 5 | 5 (Default) |
| 10 | 10 |

Details

This command is available when the MX269022A-001 is installed and CC CSI-RS is set to On.

Example of Use

To set the CSI-RS periodicity for the CC0 to 5.

```
CALC:BATC:CC:CSIR:PER 5
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity?

CC CSI-RS Periodicity T Query

Function

This command queries the CSI-RS periodicity for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | CSI-RS periodicity |
| 5 | 5 |
| 10 | 10 |

Example of Use

To query the CSI-RS periodicity for the CC0.

```
CALC:BATC:CC:CSIR:PER?
> 5
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet <integer>

CC CSI-RS Subframe Offset

### Function

This command sets the CSI-RS subframe offset for the CC.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | CSI-RS subframe offset |
| Range | When CC CSI-RS Periodicity T is 10 : 0 to 9<br>When CC CSI-RS Periodicity T is 5 : 0 to 4 |
| Resolution | 1 |
| Suffix code | None |
| Default | 0 |

### Details

This command is available when the MX269022A-001 is installed and CC CSI-RS is set to On.

### Example of Use

To set the CSI-RS subframe offset for the CC0 to 2.

```
CALC:BATC:CC:CSIR:SUBF:OFFS 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet?

CC CSI-RS Subframe Offset Query

### Function

This command queries the CSI-RS subframe offset for the CC.

### Query

`:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet?`

### Response

`<integer>`

### Parameter

| | |
|---|---|
| `<integer>` | CSI-RS subframe offset |
| Range | When CC CSI-RS Periodicity T is 10 : 0 to 9 |
| | When CC CSI-RS Periodicity T is 5 : 0 to 4 |
| Resolution | 1 |

### Example of Use

To query the CSI-RS subframe offset for the CC0.

```
CALC:BATC:CC:CSIR:SUBF:OFFS?
> 5
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer 1|2|4|8

CC CSI-RS Number of Antenna Ports

### Function

This command sets the number of CC CSI-RS antennas.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer
<mode>
```

### Parameter

| | |
|---|---|
| <mode> | Number of antennas |
| 1 | Uses 1 antenna for transmission. (Default) |
| 2 | Uses 2 antennas for transmission. |
| 4 | Uses 4 antennas for transmission. |
| 8 | Uses 8 antennas for transmission. (This can be selected only when MX269022A-001 is installed.) |

### Details

This command is available when the MX269022A-001 is installed and CC CSI-RS is set to On.

### Example of Use

To set 2 for the number of CC CSI-RS antennas for the CC0.

```
CALC:BATC:CC:CSIR:ANT:NUMB 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer?

CC CSI-RS Number of Antenna Ports Query

**Function**

This command queries the number of CC CSI-RS antennas.

**Query**

`:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer?`

**Response**

`<mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | Number of antennas |
| 1 | One antenna is used for transmission. |
| 2 | Two antennas are used for transmission. |
| 4 | Four antennas are used for transmission. |
| 8 | Eight antennas are used for transmission. |

**Example of Use**

To query the number of CC CSI-RS antennas for the CC0.

```
CALC:BATC:CC:CSIR:ANT:NUMB?
> 2
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt <integer>

CC CSI-RS Antenna Port

### Function

This command sets the CC CSI-RS antenna port number.

### Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt <integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Antenna port number |
| Range | When CC CSI-RS Number of Antenna Ports is 8,<br>15 to 22<br>When CC CSI-RS Number of Antenna Ports is 4,<br>15 to 18<br>When CC CSI-RS Number of Antenna Ports is 2,<br>15 to 16<br>When CC CSI-RS Number of Antenna Ports is 1,<br>15 |
| Resolution | 1 |
| Suffix code | None |
| Default | 15 |

### Details

This command is available when the MX269022A-001 is installed and CC CSI-RS is set to On.

### Example of Use

To set the CC CSI-RS antenna port number for the CC0 to 15.

```
CALC:BATC:CC:CSIR:APOR 15
```

## :CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt?

CC CSI-RS Antenna Port Query

**Function**

This command queries the CC CSI-RS antenna port number.

**Query**

```
:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Antenna port number |
| Range | When CC CSI-RS Number of Antenna Ports is 8, 15 to 22<br>When CC CSI-RS Number of Antenna Ports is 4, 15 to 18<br>When CC CSI-RS Number of Antenna Ports is 2, 15 to 16<br>When CC CSI-RS Number of Antenna Ports is 1, 15 |
| Resolution | 1 |

**Example of Use**

To query the CC CSI-RS antenna port number for the CC0.

```
CALC:BATC:CC:CSIR:APOR?
> 15
```

# 2.5 Utility Function

Table 2.5-1 lists the device messages used for the utility function.

**Table 2.5-1 Device Messages for Utility Function**

| Function | Device Message |
|---|---|
| Erase Warm Up Message | :DISPlay:ANNotation:WUP:ERASe |
| Display Title | :DISPlay:ANNotation:TITLe[:STATe] ON\|OFF\|1\|0 |
| | :DISPlay:ANNotation:TITLe[:STATe]? |
| Title Entry | :DISPlay:ANNotation:TITLe:DATA <string> |
| | :DISPlay:ANNotation:TITLe:DATA? |

## 2.5.1 Erase Warm Up Message

### :DISPlay:ANNotation:WUP:ERASe

Erase Warm Up Message

Function

This command cancels the warm up message display immediately after activation.

Command

```
:DISPlay:ANNotation:WUP:ERASe
```

Example of Use

To cancel the warm up message display.

```
DISP:ANN:WUP:ERAS
```

## 2.5.2 Display Title

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

Display Title

Function

This command sets title display On/Off.

Command

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

Parameter

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

Example of Use

To display the title.

```
DISP:ANN:TITL ON
```

### :DISPlay:ANNotation:TITLe[:STATe]?

Display Title Query

Function

This command queries the title display On/Off state.

Query

```
:DISPlay:ANNotation:TITLe[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Title display On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query whether the title is displayed.

```
DISP:ANN:TITL?
> 1
```

## 2.5.3 Title Entry

### :DISPlay:ANNotation:TITLe:DATA <string>

Title Entry

Function

This command sets a title character string.

Command

```
:DISPlay:ANNotation:TITLe:DATA <string>
```

Parameter

| | |
|---|---|
| `<string>` | A character string within 32 characters, enclosed in double quotations (" ") or single quotations (' ') |

Example of Use

To set a title character string.

```
DISP:ANN:TITL:DATA "TEST"
```

### :DISPlay:ANNotation:TITLe:DATA?

Title Entry Query

Function

This command queries the title character string.

Query

```
:DISPlay:ANNotation:TITLe:DATA?
```

Response

```
<string>
```

Parameter

| | |
|---|---|
| `<string>` | A character string within 32 characters, enclosed in double quotations (" ") or single quotations (' ') |

Example of Use

To query the title character string.

```
DISP:ANN:TITL:DATA?
> TEST
```

# 2.6 Common Measurement Function

Table 2.6-1 lists the device messages used for performing operations common to measurement functions.

**Table 2.6-1 Common measurement functions**

| Function | Device Message |
|---|---|
| Continuous Measurement | :INITiate:CONTinuous OFF\|ON\|0\|1 |
| | :INITiate:CONTinuous? |
| | :INITiate:MODE:CONTinuous |
| Single Measurement | :INITiate:MODE:SINGle |
| Initiate | :INITiate[:IMMediate] |
| Calculate | :INITiate:CALCulate |
| Configure | :CONFigure? |
| Save Captured Data | :MMEMory:STORe:IQData <filename>,<device> |
| | :MMEMory:STORe:IQData:CANCel |
| | :MMEMory:STORe:IQData:RATE <freq> |
| | :MMEMory:STORe:IQData:RATE? |
| Capture Time | [:SENSe]:SWEep:TIME:AUTO ON\|OFF\|1\|0 |
| | [:SENSe]:SWEep:TIME:AUTO? |
| | [:SENSe]:SWEep:TIME <time> |
| | [:SENSe]:SWEep:TIME? |
| Trigger Switch | :TRIGger[:SEQuence][:STATe] ON\|OFF\|1\|0 |
| | :TRIGger[:SEQuence][:STATe]? |
| Trigger Source | :TRIGger[:SEQuence]:SOURce EXTernal[1]\|IMMediate\|SG |
| | :TRIGger[:SEQuence]:SOURce? |
| Trigger Slope | :TRIGger[:SEQuence]:SLOPe POSitive\|NEGative |
| | :TRIGger[:SEQuence]:SLOPe? |
| Trigger Delay | :TRIGger[:SEQuence]:DELay <time> |
| | :TRIGger[:SEQuence]:DELay? |

***Note:***

The trigger setting is separately saved for each application, and is commonly applied to the measurement functions of each application.

## 2.6.1 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

When On is set, the Continuous measurement mode is set and measurement is started. When set to Off, the Single measurement mode is set but measurement does not start at that time.

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

#### Example of Use

To perform continuous measurement.

```
INIT:CONT ON
```

## :INITiate:CONTinuous?

Continuous Measurement Query

### Function

This command queries the measurement mode.

### Query

```
:INITiate:CONTinuous?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| <switch> | Measurement mode |
| 0 | Single measurement |
| 1 | Continuous measurement |

### Example of Use

To query the measurement mode.

```
INIT:CONT?
> 0
```

## :INITiate:MODE:CONTinuous

Continuous Measurement

### Function

This command starts continuous measurement.

### Command

```
:INITiate:MODE:CONTinuous
```

### Details

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

### Example of Use

To start continuous measurement.

```
INIT:MODE:CONT
```

## :INITiate:MODE:SINGle

Single Measurement

### Function

This command starts single measurement.

### Command

```
:INITiate:MODE:SINGle
```

### Details

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

### Example of Use

To start single measurement.

```
INIT:MODE:SING
```

## :INITiate[:IMMediate]

Initiate

### Function

This command starts measurement in the current measurement mode.

### Command

```
:INITiate[:IMMediate]
```

### Details

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

### Example of Use

To start measurement in the current measurement mode.

```
INIT
```

## :INITiate:CALCulate

Calculate

### Function

This command executes analysis without capturing waveforms. This command is used when executing analysis for the same captured waveform by changing parameters.

### Command

```
:INITiate:CALCulate
```

### Details

If a waveform is not captured or if a parameter that requires waveform recapturing is changed, the waveform is captured before analysis is executed.

Another command or query can be accepted even if this function is being executed. Note, however, if a command that requires waveform recapturing or trace recalculation is received, this function is stopped and the received command is executed.

To query the measurement results after executing this command, use the *WAI command to control synchronization.

Note that synchronization control during the Continuous mode is not supported.

### Example of Use

To start the measurement in the current measurement mode.

```
INIT:CALC
```

# :CONFigure?

Configure Query

## Function

This command queries the current measurement function.

## Query

```
:CONFigure?
```

## Response

```
<mode>
```

## Parameter

| | |
|---|---|
| `<mode>` | Measurement function |
| `EVM` | Modulation measurement |
| `ACP` | ACP measurement |
| `CHP` | Channel Power measurement |
| `OBW` | OBW measurement |
| `SEM` | SEM measurement |

## Example of Use

To query the current measurement function.

```
CONF?
> EVM
```

## :MMEMory:STORe:IQData <filename>,<device>

Save Captured Data

Function

This command saves the captured waveform data in a file.

Command

```
:MMEMory:STORe:IQData <filename>,<device>
```

Parameter

| | |
|---|---|
| `<filename>` | Name of the file to be saved.<br>Specify with any character string enclosed by double quotes (“ ”) or single quotes (‘ ’) |
| `<device>` | Name of the drive to be saved.<br>Drive name: A, B, D, E |

Details

Files are saved to the following directory in the specified drive.
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\LTE-TDD Downlink
Up to 1000 files can be saved in a folder.
This command is not available when the Batch measurement function is executed.

Example of Use

To save the waveform data to the D drive using the file name DATA.

```
MMEM:STOR:IQD “DATA”,D
```

## :MMEMory:STORe:IQData:CANCel

Cancel Execute Save Captured Data

Function

This command cancels the saving of a waveform data file.

Command

```
:MMEMory:STORe:IQData:CANCel
```

Example of Use

To cancel the saving of a waveform data file.

```
MMEM:STOR:IQD:CANC
```

Details

This command is not available when the Batch measurement function is executed.

## :MMEMory:STORe:IQData:RATE <freq>

Output Rate for Save Captured Data

### Function

This command saves the output rate when executing Save Captured Data.

### Command

```
:MMEMory:STORe:IQData:RATE <freq>
```

### Parameter

| | |
|---|---|
| `<freq>` | Output rate |
| Range | 20 to 50 MHz |
| Default | 50 MHz |
| Suffix code | HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ<br>Hz is used when omitted. |

### Details

This command is not available when the Batch measurement function is executed.

### Example of Use

To set the output rate to 30 MHz.

```
MMEM:STOR:IQD:RATE 30MHZ
```

## :MMEMory:STORe:IQData:RATE?

Output Rate for Save Captured Data Query

Function

This command queries the output rate when executing Save Captured Data.

Query

```
:MMEMory:STORe:IQData:RATE?
```

Response

```
<freq>
```

Parameter

| | |
|---|---|
| <freq> | Output rate |
| Range | 20 to 50 MHz |

No suffix code. Value is returned in Hz units.

Details

This command is not available when the Batch measurement function is executed.

Example of Use

To query the output rate.

```
MMEM:STOR:IQD:RATE?
> 30000000
```

## [:SENSe]:SWEep:TIME:AUTO ON|OFF|1|0

Capture Time Auto

Function

This command selects whether the waveform capture time (Capture Time) is automatically or manually specified.

Command

```
[:SENSe]:SWEep:TIME:AUTO <switch>
```

Parameter

| | |
|---|---|
| <switch> | Automatic/Manual setting of Capture Time |
| ON\|1 | Automatic setting (Default) |
| OFF\|0 | Manual setting |

Details

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

Example of Use

To configure an automatic setting for the capture time.

```
SWE:TIME:AUTO ON
```

## [:SENSe]:SWEep:TIME:AUTO?

Capture Time Auto Query

Function

This command queries whether the waveform capture time (Capture Time) is automatically or manually specified.

Query

```
[:SENSe]:SWEep:TIME:AUTO?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Automatic/Manual setting of Capture Time |
| `1` | Automatic setting |
| `0` | Manual setting |

Details

This command is not available when the Batch measurement function is executed.

Example of Use

To query the setting of the capture time.

```
SWE:TIME:AUTO?
> 1
```

## [:SENSe]:SWEep:TIME <time>

Capture Time Length

Function

This command sets the capture time of the waveform.

Command

```
[:SENSe]:SWEep:TIME <time>
```

Parameter

| | |
|---|---|
| `<time>` | Capture time (in frame units) |
| Range/Resolution | 5 to 150 |
| Default | 5 |
| Suffix code | None |

Details

The automatic mode is switched to the manual mode when the capture time is set.
This command is not available when the Replay function is executed.
This command is not available when the Batch measurement function is executed.

Example of Use

To set 20 frames for the capture time.

```
SWE:TIME 20
```

## [:SENSe]:SWEep:TIME?

Capture Time Length Query

### Function

This command queries the capture time of the waveform.

### Query

```
[:SENSe]:SWEep:TIME?
```

### Response

```
<time>
```

### Parameter

| | |
|---|---|
| `<time>` | Capture time (in frame units) |
| Range/Resolution | 5 to 150 |
| Suffix code | None |

### Details

This command is not available when the Batch measurement function is executed.

### Example of Use

To query the capture time of the waveform.

```
SWE:TIME?
> 20
```

## 2.6.2 Trigger Switch

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

Trigger Switch

Function

This command sets the trigger wait state On/Off.

Command

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

Parameter

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

Details

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

Example of Use

To set the trigger wait state On.

```
TRIG ON
```

### :TRIGger[:SEQuence][:STATe]?

Trigger Switch Query

Function

This command queries the trigger wait state On/Off.

Query

```
:TRIGger[:SEQuence][:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| `<switch>` | Trigger wait On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the trigger wait state On/Off.

```
TRIG?
> 1
```

## 2.6.3 Trigger Source

### :TRIGger[:SEQuence]:SOURce EXTernal[1]|IMMediate|SG

Trigger Source

Function

This command selects the trigger signal source.

Command

```
:TRIGger[:SEQuence]:SOURce <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Trigger signal source |
| `EXTernal[1]` | External input (Default) |
| `IMMediate` | Free run |
| `SG` | SG marker |

Details

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

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

Example of Use

To set the trigger signal source to external input.

```
TRIG:SOUR EXT
```

## :TRIGger[:SEQuence]:SOURce?

Trigger Source Query

### Function

This command queries the trigger signal source.

### Query

```
:TRIGger[:SEQuence]:SOURce?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Trigger signal source |
| `EXT` | External input |
| `IMM` | Free run |
| `SG` | SG marker |

### Details

No response is returned when SG marker is selected but without Vector Signal Generator installed. .

### Example of Use

To query the trigger signal source.

```
TRIG:SOUR?
> EXT
```

## 2.6.4 Trigger Slope

### :TRIGger[:SEQuence]:SLOPe POSitive|NEGative

Trigger Slope

**Function**

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

**Command**

```
:TRIGger[:SEQuence]:SLOPe <mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Trigger detection mode |
| POSitive | Triggers are detected at the rising edge (Default). |
| NEGative | Triggers are detected at the falling edge. |

**Details**

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

**Example of Use**

To detect a trigger at the rising edge.

```
TRIG:SLOP POS
```

### :TRIGger[:SEQuence]:SLOPe?

Trigger Slope Query

**Function**

This command queries the trigger detection mode (rising or falling).

**Query**

```
:TRIGger[:SEQuence]:SLOPe?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| <mode> | Trigger detection mode |
| POS | Triggers are detected at the rising edge. |
| NEG | Triggers are detected at the falling edge. |

**Example of Use**

To query the trigger detection mode.

```
TRIG:SLOP?
> POS
```

## 2.6.5 Trigger Delay

### :TRIGger[:SEQuence]:DELay <time>

Trigger Delay

Function

This command sets the trigger delay time from generation of a trigger to start of a capture operation.

Command

```
:TRIGger[:SEQuence]:DELay <time>
```

Parameter

| | | | |
|---|---|---|---|
| `<time>` | | Trigger delay time | |
| | Range | −2 to +2 s | (When the Measure is Modulation Analysis, Power vs Time or MIMO Summary.) |
| | | −0.5 to +0.5 s | (When the Measure is Batch Measurement.) |
| | Resolution | 20 ns | |
| | Suffix code | NS, US, MS, S<br>s is used when omitted. | |
| | Default value | 0 s | |

Details

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

Example of Use

To set the trigger delay time to 20 ms.

```
TRIG:DEL 20MS
```

## :TRIGger[:SEQuence]:DELay?

Trigger Delay Query

### Function

This command queries the trigger delay time from generation of a trigger to start of a capture operation.

### Query

```
:TRIGger[:SEQuence]:DELay?
```

### Response

```
<time>
```

### Parameter

| | | | |
|---|---|---|---|
| <time> | | Trigger delay time | |
| | Range | –2 to +2 s | (When the Measure is Modulation Analysis, Power vs Time or MIMO Summary.) |
| | | –0.5 to +0.5 s | (When the Measure is Batch Measurement.) |
| | Resolution | 20 ns<br>Value is returned in second units. | |

### Example of Use

To query the trigger delay time.

```
TRIG:DEL?
> 0.02000000
```

# 2.7 ACP/Channel Power/OBW/SEM Measurement Functions

Table 2.7-1 lists the device messages used for calling the ACP, Channel Power, OBW, and SEM measurement functions. The application to be used, the Signal Analyzer or Spectrum Analyzer, must be activated before using these device messages.

For the commands and queries to be used for control after any of these measurement functions is called, refer to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control)* or the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Operation Manual (Spectrum Analyzer Function Remote Control)*.

**Table 2.7-1 Device Messages for ACP, Channel Power, OBW, and SEM Measurement Functions**

| Function | Device Message |
|---|---|
| Configure – ACP | `:CONFigure[:FFT|SWEPt]:ACP` |
| Configure – Channel Power | `:CONFigure[:FFT|SWEPt]:CHPower` |
| Configure – OBW | `:CONFigure[:FFT|SWEPt]:OBWidth` |
| Configure – SEM | `:CONFigure:SWEPt:SEMask` |
| Using application for ACP | `[:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt` |
| | `[:SENSe]:ACPower:INSTrument[:SELect]?` |
| Using application for Channel Power | `[:SENSe]:CHPower:INSTrument[:SELect] FFT|SWEPt` |
| | `[:SENSe]:CHPower:INSTrument[:SELect]?` |
| Using application for OBW | `[:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEPt` |
| | `[:SENSe]:OBWidth:INSTrument[:SELect]?` |
| Coupled Ref & ATT in Swept & FFT | `[:SENSe]:ASETting:CATT OFF|ON|0|1` |

***Note:***

`FETCh:<measure>`, `INITiate:<measure>`, `READ:<measure>`, and `MEASure:<measure>` cannot be used when this application is selected, except for the Modulation measurement. These commands and their corresponding queries can be used when the Signal Analyzer or Spectrum Analyzer is selected after `CONFigure:<measure>` is executed.

## :CONFigure[:FFT|SWEPt]:ACP

ACP

### Function

This command selects the ACP measurement function.

When `FFT` or `SWEPt` is omitted, set the measurement mode by `[:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt`.

### Command

```
:CONFigure[:FFT|SWEPt]:ACP
```

### Details

This command only selects the measurement function and does not start measurement.
`CONFigure[:FFT]:ACP` is effective only when Channel Bandwidth is set to 1.4, 3, or 5 MHz.

### Example of Use

To select the ACP measurement function of the Spectrum Analyzer.

```
CONF:SWEP:ACP
```

## :CONFigure[:FFT|SWEPt]:CHPower

Channel Power

### Function

This command selects the Channel Power measurement function.

When `FFT` or `SWEPt` is omitted, set the measurement mode by `[:SENSe]:CHPower:INSTrument[:SELect] FFT|SWEPt`.

### Command

```
:CONFigure[:FFT|SWEPt]:CHPower
```

### Details

This command only selects the measurement function and does not start measurement.

### Example of Use

To select the Channel Power measurement function of the Spectrum Analyzer.

```
CONF:SWEP:CHP
```

## :CONFigure[:FFT|SWEPt]:OBWidth

OBW

### Function

This command selects the OBW measurement function.

When `FFT` or `SWEPt` is omitted, set the measurement mode by `[:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEPt`.

### Command

```
:CONFigure[:FFT|SWEPt]:OBWidth
```

### Details

This command only selects the measurement function and does not start measurement.

### Example of Use

To select the OBW measurement function of the Spectrum Analyzer.

```
CONF:SWEP:OBW
```

## :CONFigure:SWEPt:SEMask

SEM

### Function

This command selects the SEM measurement function.

### Command

```
:CONFigure[:SWEPt]:SEMask
```

### Details

This command only selects the measurement function and does not start measurement.
The SEM measurement function is enabled only in the Spectrum Analyzer.

### Example of Use

To select the SEM measurement function of the Spectrum Analyzer.

```
CONF:SWEP:SEM
```

## [:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt

Measurement Method for ACP

Function

This command sets the measurement mode to be applied when `:CONFigure:ACP` is executed.

Command

```
[:SENSe]:ACPower:INSTrument[:SELect] <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEPt` | Spectrum Analyzer function (Default) |

Details

This command only selects the measurement mode and does not start measurement.

Example of Use

To use the Signal Analyzer function when executing the ACP measurement function.

```
ACP:INST FFT
```

## [:SENSe]:ACPower:INSTrument[:SELect]?

Measurement Method for ACP Query

Function

This command queries the measurement mode to be applied when `:CONFigure:ACP` is executed.

Query

```
[:SENSe]:ACPower:INSTrument[:SELect]?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEP` | Spectrum Analyzer function |

Example of Use

To query the measurement mode to be applied when executing the ACP measurement function.

```
ACP:INST?
> FFT
```

## [:SENSe]:CHPower:INSTrument[:SELect] FFT|SWEPt

Measurement Method for Channel Power

### Function

This command sets the measurement mode to be applied when `:CONFigure:CHPower` is executed.

### Command

```
[:SENSe]:CHPower:INSTrument[:SELect] <mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEPt` | Spectrum Analyzer function (Default) |

### Details

This command only selects the measurement mode and does not start measurement.

### Example of Use

To use the Signal Analyzer function when executing the Channel Power measurement function.

```
CHP:INST FFT
```

## [:SENSe]:CHPower:INSTrument[:SELect]?

Measurement Method for Channel Power Query

### Function

This command queries the measurement mode to be applied when `:CONFigure:CHPower` is executed.

### Command

```
[:SENSe]:CHPower:INSTrument[:SELect]?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEP` | Spectrum Analyzer function |

### Example of Use

To query the measurement mode to be applied when executing the Channel Power measurement function.

```
CHP:INST?
> FFT
```

## [:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEPt

Measurement Method for OBW

**Function**

This command sets the measurement mode to be applied when `:CONFigure:OBWidth` is executed.

**Command**

```
[:SENSe]:OBWidth:INSTrument[:SELect] <mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEPt` | Spectrum Analyzer function (Default) |

**Details**

This command only selects the measurement mode and does not start measurement.

**Example of Use**

To use the Signal Analyzer function when executing the OBW measurement function.

```
OBW:INST FFT
```

## [:SENSe]:OBWidth:INSTrument[:SELect]?

Measurement Method for OBW Query

**Function**

This command queries the measurement mode to be applied when `:CONFigure:OBWidth` is executed.

**Command**

```
[:SENSe]:OBWidth:INSTrument[:SELect] <mode>
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Measurement mode |
| `FFT` | Signal Analyzer function |
| `SWEP` | Spectrum Analyzer function |

**Example of Use**

To query the measurement mode to be applied when executing the OBW measurement function.

```
OBW:INST?
> FFT
```

## [:SENSe]:ASETting:CATT OFF|ON|0|1

Coupled Ref & ATT in Swept & FFT

**Function**

This command sets whether to inherit ATT setting when switching function among the followings:

ACP (Swept), ACP (FFT), Channel Power (Swept), Channel Power (FFT), OBW (FFT), OBW (Swept), Spectrum Emission Mask (Swept)

**Command**

```
[:SENSe]:ASETting:CATT <switch>
```

**Parameter**

`<switch>`

| | |
|---|---|
| `0|OFF` | Does not inherit the setting (Default) |
| `1|ON` | Inherits the setting |

**Details**

If switching function via other Measure functions or other applications, the ATT setting will not be inherited.

**Example of Use**

To inherit the ATT setting when switching among Measure function (Swept/FFT).

```
ASET:CATT ON
```

## [:SENSe]:ASETting:CATT?

Coupled Ref & ATT in Swept & FFT Query

### Function

This command queries the setting of whether to inherit ATT setting when switching function among the followings:

ACP (Swept), ACP (FFT), Channel Power (Swept), Channel Power (FFT), OBW (FFT), OBW (Swept), Spectrum Emission Mask (Swept)

### Query

```
[:SENSe]:ASETting:CATT?
```

### Response

```
<switch>
```

### Parameter

```
<switch>
```

| | |
|---|---|
| 0 | Does not inherit the setting |
| 1 | Inherits the setting |

### Details

If switching function via other Measure functions or other applications, the ATT setting will not be inherited.

### Example of Use

To query the setting of whether to inherit the ATT setting when switching among Measure function (Swept/FFT).

```
ASET:CATT?
>1
```

# 2.8 Modulation Measurement Function

This section describes the device messages related to Modulation measurement.

Table 2.8-1 lists the device messages used for execution and result query of Modulation measurement.

**Table 2.8-1 Device Messages for Modulation Measurement Functions**

| Function | Device Message |
|---|---|
| Configure | :CONFigure:EVM |
| Initiate | :INITiate:EVM |
| Fetch | :FETCh:EVM[n]? |
| Read/Measure | :READ:EVM[n]? |
| | :MEASure:EVM[n]? |

Table 2.8-2 lists the responses to parameter [n] of the device messages in Table 2.8-1.

**Table 2.8-2 Responses to Modulation Measurement Results**

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Frequency Error (Average) [Hz]<br>2. Frequency Error (Maximum) [Hz]<br>3. Frequency Error PPM (Average) [ppm]<br>4. Frequency Error PPM (Maximum) [ppm]<br>5. Output Power (Average) [dBm]<br>6. Output Power (Maximum) [dBm]<br>7. Mean Power (Average) [dBm]<br>8. Mean Power (Maximum) [dBm]<br>9. EVM rms (Average) [%]<br>10. EVM rms (Maximum) [%]<br>11. EVM peak (Average) [%]<br>12. EVM peak (Maximum) [%]<br>13. EVM peak Symbol Number<br>14. EVM peak Subcarrier Number<br>15. EVM peak Frame Number<br>16. Origin Offset (Average) [dB]<br>17. Origin Offset (Maximum) [dB]<br>18. Time Offset (Average) [seconds]<br>19. Time Offset (Maximum) [seconds]<br>20. Symbol Clock Error (Average) [ppm]<br>21. Symbol Clock Error (Maximum) [ppm] |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 2 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Total EVM result valid (1=valid/0=invalid)<br>2. Total EVM rms (Average)<br>3. Total EVM rms (Maximum)<br>4. Total EVM peak (Average)<br>5. Total EVM peak (Maximum)<br>6. Total EVM peak Symbol Number<br>7. Total EVM peak Subcarrier Number<br>8. Total EVM peak Frame Number<br>9. Total EVM High rms (Average)<br>10. Total EVM High rms (Maximum)<br>11. Total EVM High peak (Average)<br>12. Total EVM High peak (Maximum)<br>13. Total EVM High peak Symbol Number<br>14. Total EVM High peak Subcarrier Number<br>15. Total EVM High peak Frame Number<br>16. Total EVM Low rms (Average)<br>17. Total EVM Low rms (Maximum)<br>18. Total EVM Low peak (Average)<br>19. Total EVM Low peak (Maximum)<br>20. Total EVM Low peak Symbol Number<br>21. Total EVM Low peak Subcarrier Number<br>22. Total EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 3 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH ALL EVM result valid (1=valid/0=invalid)<br>2. PDSCH ALL EVM rms (Average)<br>3. PDSCH ALL EVM rms (Maximum)<br>4. PDSCH ALL EVM peak (Average)<br>5. PDSCH ALL EVM peak (Maximum)<br>6. PDSCH ALL EVM peak Symbol Number<br>7. PDSCH ALL EVM peak Subcarrier Number<br>8. PDSCH ALL EVM peak Frame Number<br>9. PDSCH ALL EVM High rms (Average)<br>10. PDSCH ALL EVM High rms (Maximum)<br>11. PDSCH ALL EVM High peak (Average)<br>12. PDSCH ALL EVM High peak (Maximum)<br>13. PDSCH ALL EVM High peak Symbol Number<br>14. PDSCH ALL EVM High peak Subcarrier Number<br>15. PDSCH ALL EVM High peak Frame Number<br>16. PDSCH ALL EVM Low rms (Average)<br>17. PDSCH ALL EVM Low rms (Maximum)<br>18. PDSCH ALL EVM Low peak (Average)<br>19. PDSCH ALL EVM Low peak (Maximum)<br>20. PDSCH ALL EVM Low peak Symbol Number<br>21. PDSCH ALL EVM Low peak Subcarrier Number<br>22. PDSCH ALL EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 4 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH QPSK EVM result valid (1=valid/0=invalid)<br>2. PDSCH QPSK EVM rms (Average)<br>3. PDSCH QPSK EVM rms (Maximum)<br>4. PDSCH QPSK EVM peak (Average)<br>5. PDSCH QPSK EVM peak (Maximum)<br>6. PDSCH QPSK EVM peak Symbol Number<br>7. PDSCH QPSK EVM peak Subcarrier Number<br>8. PDSCH QPSK EVM peak Frame Number<br>9. PDSCH QPSK EVM High rms (Average)<br>10. PDSCH QPSK EVM High rms (Maximum)<br>11. PDSCH QPSK EVM High peak (Average)<br>12. PDSCH QPSK EVM High peak (Maximum)<br>13. PDSCH QPSK EVM High peak Symbol Number<br>14. PDSCH QPSK EVM High peak Subcarrier Number<br>15. PDSCH QPSK EVM High peak Frame Number<br>16. PDSCH QPSK EVM Low rms (Average)<br>17. PDSCH QPSK EVM Low rms (Maximum)<br>18. PDSCH QPSK EVM Low peak (Average)<br>19. PDSCH QPSK EVM Low peak (Maximum)<br>20. PDSCH QPSK EVM Low peak Symbol Number<br>21. PDSCH QPSK EVM Low peak Subcarrier Number<br>22. PDSCH QPSK EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 5 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 16QAM EVM result valid (1=valid/0=invalid)<br>2. PDSCH 16QAM EVM rms (Average)<br>3. PDSCH 16QAM EVM rms (Maximum)<br>4. PDSCH 16QAM EVM peak (Average)<br>5. PDSCH 16QAM EVM peak (Maximum)<br>6. PDSCH 16QAM EVM peak Symbol Number<br>7. PDSCH 16QAM EVM peak Subcarrier Number<br>8. PDSCH 16QAM EVM peak Frame Number<br>9. PDSCH 16QAM EVM High rms (Average)<br>10. PDSCH 16QAM EVM High rms (Maximum)<br>11. PDSCH 16QAM EVM High peak (Average)<br>12. PDSCH 16QAM EVM High peak (Maximum)<br>13. PDSCH 16QAM EVM High peak Symbol Number<br>14. PDSCH 16QAM EVM High peak Subcarrier Number<br>15. PDSCH 16QAM EVM High peak Frame Number<br>16. PDSCH 16QAM EVM Low rms (Average)<br>17. PDSCH 16QAM EVM Low rms (Maximum)<br>18. PDSCH 16QAM EVM Low peak (Average)<br>19. PDSCH 16QAM EVM Low peak (Maximum)<br>20. PDSCH 16QAM EVM Low peak Symbol Number<br>21. PDSCH 16QAM EVM Low peak Subcarrier Number<br>22. PDSCH 16QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 6 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 64QAM EVM result valid (1=valid/0=invalid)<br>2. PDSCH 64QAM EVM rms (Average)<br>3. PDSCH 64QAM EVM rms (Maximum)<br>4. PDSCH 64QAM EVM peak (Average)<br>5. PDSCH 64QAM EVM peak (Maximum)<br>6. PDSCH 64QAM EVM peak Symbol Number<br>7. PDSCH 64QAM EVM peak Subcarrier Number<br>8. PDSCH 64QAM EVM peak Frame Number<br>9. PDSCH 64QAM EVM High rms (Average)<br>10. PDSCH 64QAM EVM High rms (Maximum)<br>11. PDSCH 64QAM EVM High peak (Average)<br>12. PDSCH 64QAM EVM High peak (Maximum)<br>13. PDSCH 64QAM EVM High peak Symbol Number<br>14. PDSCH 64QAM EVM High peak Subcarrier Number<br>15. PDSCH 64QAM EVM High peak Frame Number<br>16. PDSCH 64QAM EVM Low rms (Average)<br>17. PDSCH 64QAM EVM Low rms (Maximum)<br>18. PDSCH 64QAM EVM Low peak (Average)<br>19. PDSCH 64QAM EVM Low peak (Maximum)<br>20. PDSCH 64QAM EVM Low peak Symbol Number<br>21. PDSCH 64QAM EVM Low peak Subcarrier Number<br>22. PDSCH 64QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 7 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. RS EVM result valid (1=valid/0=invalid)<br>2. RS EVM rms (Average)<br>3. RS EVM rms (Maximum)<br>4. RS EVM peak (Average)<br>5. RS EVM peak (Maximum)<br>6. RS EVM peak Symbol Number<br>7. RS EVM peak Subcarrier Number<br>8. RS EVM peak Frame Number<br>9. RS EVM High rms (Average)<br>10. RS EVM High rms (Maximum)<br>11. RS EVM High peak (Average)<br>12. RS EVM High peak (Maximum)<br>13. RS EVM High peak Symbol Number<br>14. RS EVM High peak Subcarrier Number<br>15. RS EVM High peak Frame Number<br>16. RS EVM Low rms (Average)<br>17. RS EVM Low rms (Maximum)<br>18. RS EVM Low peak (Average)<br>19. RS EVM Low peak (Maximum)<br>20. RS EVM Low peak Symbol Number<br>21. RS EVM Low peak Subcarrier Number<br>22. RS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 8 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PBCH EVM result valid (1=valid/0=invalid)<br>2. PBCH EVM rms (Average)<br>3. PBCH EVM rms (Maximum)<br>4. PBCH EVM peak (Average)<br>5. PBCH EVM peak (Maximum)<br>6. PBCH EVM peak Symbol Number<br>7. PBCH EVM peak Subcarrier Number<br>8. PBCH EVM peak Frame Number<br>9. PBCH EVM High rms (Average)<br>10. PBCH EVM High rms (Maximum)<br>11. PBCH EVM High peak (Average)<br>12. PBCH EVM High peak (Maximum)<br>13. PBCH EVM High peak Symbol Number<br>14. PBCH EVM High peak Subcarrier Number<br>15. PBCH EVM High peak Frame Number<br>16. PBCH EVM Low rms (Average)<br>17. PBCH EVM Low rms (Maximum)<br>18. PBCH EVM Low peak (Average)<br>19. PBCH EVM Low peak (Maximum)<br>20. PBCH EVM Low peak Symbol Number<br>21. PBCH EVM Low peak Subcarrier Number<br>22. PBCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 9 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. P-SS EVM result valid (1=valid/0=invalid)<br>2. P-SS EVM rms (Average)<br>3. P-SS EVM rms (Maximum)<br>4. P-SS EVM peak (Average)<br>5. P-SS EVM peak (Maximum)<br>6. P-SS EVM peak Symbol Number<br>7. P-SS EVM peak Subcarrier Number<br>8. P-SS EVM peak Frame Number<br>9. P-SS EVM High rms (Average)<br>10. P-SS EVM High rms (Maximum)<br>11. P-SS EVM High peak (Average)<br>12. P-SS EVM High peak (Maximum)<br>13. P-SS EVM High peak Symbol Number<br>14. P-SS EVM High peak Subcarrier Number<br>15. P-SS EVM High peak Frame Number<br>16. P-SS EVM Low rms (Average)<br>17. P-SS EVM Low rms (Maximum)<br>18. P-SS EVM Low peak (Average)<br>19. P-SS EVM Low peak (Maximum)<br>20. P-SS EVM Low peak Symbol Number<br>21. P-SS EVM Low peak Subcarrier Number<br>22. P-SS EVM Low peak Frame Number |

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Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 10 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. S-SS EVM result valid (1=valid/0=invalid)<br>2. S-SS EVM rms (Average)<br>3. S-SS EVM rms (Maximum)<br>4. S-SS EVM peak (Average)<br>5. S-SS EVM peak (Maximum)<br>6. S-SS EVM peak Symbol Number<br>7. S-SS EVM peak Subcarrier Number<br>8. S-SS EVM peak Frame Number<br>9. S-SS EVM High rms (Average)<br>10. S-SS EVM High rms (Maximum)<br>11. S-SS EVM High peak (Average)<br>12. S-SS EVM High peak (Maximum)<br>13. S-SS EVM High peak Symbol Number<br>14. S-SS EVM High peak Subcarrier Number<br>15. S-SS EVM High peak Frame Number<br>16. S-SS EVM Low rms (Average)<br>17. S-SS EVM Low rms (Maximum)<br>18. S-SS EVM Low peak (Average)<br>19. S-SS EVM Low peak (Maximum)<br>20. S-SS EVM Low peak Symbol Number<br>21. S-SS EVM Low peak Subcarrier Number<br>22. S-SS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 11 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDCCH EVM result valid (1=valid/0=invalid)<br>2. PDCCH EVM rms (Average)<br>3. PDCCH EVM rms (Maximum)<br>4. PDCCH EVM peak (Average)<br>5. PDCCH EVM peak (Maximum)<br>6. PDCCH EVM peak Symbol Number<br>7. PDCCH EVM peak Subcarrier Number<br>8. PDCCH EVM peak Frame Number<br>9. PDCCH EVM High rms (Average)<br>10. PDCCH EVM High rms (Maximum)<br>11. PDCCH EVM High peak (Average)<br>12. PDCCH EVM High peak (Maximum)<br>13. PDCCH EVM High peak Symbol Number<br>14. PDCCH EVM High peak Subcarrier Number<br>15. PDCCH EVM High peak Frame Number<br>16. PDCCH EVM Low rms (Average)<br>17. PDCCH EVM Low rms (Maximum)<br>18. PDCCH EVM Low peak (Average)<br>19. PDCCH EVM Low peak (Maximum)<br>20. PDCCH EVM Low peak Symbol Number<br>21. PDCCH EVM Low peak Subcarrier Number<br>22. PDCCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 12 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PCFICH EVM result valid (1=valid/0=invalid)<br>2. PCFICH EVM rms (Average)<br>3. PCFICH EVM rms (Maximum)<br>4. PCFICH EVM peak (Average)<br>5. PCFICH EVM peak (Maximum)<br>6. PCFICH EVM peak Symbol Number<br>7. PCFICH EVM peak Subcarrier Number<br>8. PCFICH EVM peak Frame Number<br>9. PCFICH EVM High rms (Average)<br>10. PCFICH EVM High rms (Maximum)<br>11. PCFICH EVM High peak (Average)<br>12. PCFICH EVM High peak (Maximum)<br>13. PCFICH EVM High peak Symbol Number<br>14. PCFICH EVM High peak Subcarrier Number<br>15. PCFICH EVM High peak Frame Number<br>16. PCFICH EVM Low rms (Average)<br>17. PCFICH EVM Low rms (Maximum)<br>18. PCFICH EVM Low peak (Average)<br>19. PCFICH EVM Low peak (Maximum)<br>20. PCFICH EVM Low peak Symbol Number<br>21. PCFICH EVM Low peak Subcarrier Number<br>22. PCFICH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 13 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PHICH EVM result valid (1=valid/0=invalid)<br>2. PHICH EVM rms (Average)<br>3. PHICH EVM rms (Maximum)<br>4. PHICH EVM peak (Average)<br>5. PHICH EVM peak (Maximum)<br>6. PHICH EVM peak Symbol Number<br>7. PHICH EVM peak Subcarrier Number<br>8. PHICH EVM peak Frame Number<br>9. PHICH EVM High rms (Average)<br>10. PHICH EVM High rms (Maximum)<br>11. PHICH EVM High peak (Average)<br>12. PHICH EVM High peak (Maximum)<br>13. PHICH EVM High peak Symbol Number<br>14. PHICH EVM High peak Subcarrier Number<br>15. PHICH EVM High peak Frame Number<br>16. PHICH EVM Low rms (Average)<br>17. PHICH EVM Low rms (Maximum)<br>18. PHICH EVM Low peak (Average)<br>19. PHICH EVM Low peak (Maximum)<br>20. PHICH EVM Low peak Symbol Number<br>21. PHICH EVM Low peak Subcarrier Number<br>22. PHICH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 14 | A/B | The Constellation graph display data is returned with comma-separated value formats in the following order:<br>1. I-phase data of the 0th subcarrier<br>2. Q-phase data of the 0th subcarrier<br>3. I-phase data of the 1st subcarrier<br>4. Q-phase data of the 1st subcarrier<br>…<br>2×N–1. I-phase data of the (N–1)th subcarrier<br>2×N. Q-phase data of the (N–1)th subcarrier<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |
| 15 | A/B | The EVM (rms) vs Subcarrier graph display data is returned with comma-separated value formats in the following order:<br>1. EVM (rms) of the 0th subcarrier<br>2. EVM (rms) of the 1st subcarrier<br>…<br>N. EVM (rms) of the (N–1)th subcarrier<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |
| 16 | A/B | The EVM (peak) vs Subcarrier graph display data is returned with comma-separated value formats in the following order:<br>1. EVM (peak) of the 0th subcarrier<br>2. EVM (peak) of the 1st subcarrier<br>…<br>N. EVM (peak) of the (N–1)th subcarrier<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |
| 17 | A/B | The EVM (rms) vs Symbol graph display data is returned with comma-separated value formats in the following order:<br>1. EVM (rms) of the 0th symbol<br>2. EVM (rms) of the 1st symbol<br>…<br>140. EVM (rms) of the 139th symbol |
| 18 | A/B | The EVM (peak) vs Symbol graph display data is returned with comma-separated value formats in the following order:<br>1. EVM (peak) of the 0th symbol<br>2. EVM (peak) of the 1st symbol<br>…<br>140. EVM (peak) of the 139th symbol |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 19 | A/B | The Spectral Flatness (Amplitude vs Subcarrier) graph display data is returned with comma-separated value formats in the following order:<br>1. Spectral flatness amplitude of the 0th subcarrier<br>2. Spectral flatness amplitude of the 1st subcarrier<br>…<br>N. Spectral flatness amplitude of the (N–1)th subcarrier<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |
| 20 | A/B | The Spectral Flatness (Difference Amplitude vs Subcarrier) graph display data is returned with comma-separated value formats in the following order:<br>1. Spectral flatness differential amplitude of the 1st subcarrier, relative to the 0th subcarrier.<br>2. Spectral flatness differential amplitude of the 2nd subcarrier, relative to the 1st subcarrier.<br>…<br>N/2–1. Spectral flatness differential amplitude of the N/2–1 subcarrier, relative to the N/2–2 subcarrier.<br>N/2. Spectral flatness differential amplitude of the N/2 subcarrier, relative to the N/2+1 subcarrier.<br>…<br>N–2. Spectral flatness differential amplitude of the N–2 subcarrier, relative to the N–1 subcarrier.<br><br>N : N: Number of Subcarriers determined by Channel Bandwidth. |
| 21 | A/B | The Spectral Flatness (Phase vs Subcarrier) graph display data is returned with comma-separated value formats in the following order:<br>1. Spectral flatness phase of the 0th subcarrier<br>2. Spectral flatness phase of the 1st subcarrier<br>…<br>N. Spectral flatness phase of the (N–1)th subcarrier<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 22 | A/B | Spectral Flatness (Group Delay vs Subcarrier) graph display data is returned with comma-separated value formats in the following order:<br>1. Spectral flatness group delay of the 1st subcarrier, relative to the 0th subcarrier.<br>2. Spectral flatness group delay of the 2nd subcarrier, relative to the 1st subcarrier.<br>…<br>N/2–1. Spectral flatness group delay of the N/2–1 subcarrier, relative to the N/2–2 subcarrier.<br>N/2. Spectral flatness group delay of the N/2 subcarrier, relative to the N/2+1 subcarrier.<br>…<br>N–2. Spectral flatness group delay of the N–2 subcarrier, relative to the N–1 subcarrier.<br><br>N: Number of Subcarriers determined by Channel Bandwidth. |
| 23 | A/B | As for the Power vs Resource Block graph display data, each resource block's modulation method is returned with comma-separated value formats in the following order:<br>1. RB 0 Modulation method applied to Subframe 0.<br>2. RB 1 Modulation method applied to Subframe 0.<br>…<br>RB M–1 Modulation method applied to M. Subframe 0.<br>1. RB 0 Modulation method applied to M+1. Subframe 1.<br>…<br>RB M–1 Modulation method applied to M×10. Subframe 9.<br><br>Response format:<br>`QPSK`: QPSK<br>`16Q`: 16QAM<br>`64Q`: 64QAM<br>`256Q`: 256QAM<br>`DTX`: invalid<br>`-999.0`: invalid Subframe<br><br>M: The number of resource block per 1 subframe, determined by Channel Bandwidth. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 24 | A/B | As for the Power vs Resource Block graph display data, each resource block's relative power, which is based on the RS Power, is returned with comma-separated value formats in the following order:<br>1. RB 0 Power (dB) applied to Subframe 0.<br>2. RB 1 Modulation Power (dB) applied to Subframe 0.<br>…<br>RB M–1 Power (dB) applied to M. Subframe 0.<br>RB 0 Power (dB) applied to M+1. Subframe 1.<br>…<br>RB M–1 Power (dB) applied to M×10. Subframe 9.<br><br>M: The number of resource block per 1 subframe, determined by Channel Bandwidth. |
| 25 | A/B | As for the EVM vs Resource Block graph display data, each resource block's RMS EVM is returned with comma-separated value formats in the following order:<br>1. RB 0 EVM (rms) applied to Subframe 0.<br>2. RB 1 EVM (rms) applied to Subframe 0.<br>…<br>RB M–1 EVM (rms) applied to M. Subframe 0.<br>RB 0 EVM (rms) applied to M+1. Subframe 1.<br>…<br>RB M–1 EVM (rms) applied to M×10. Subframe 9.<br><br>The unit of the response depends on the setting of EVM Unit (% or dB).<br>M: The number of resource block per 1 subframe, determined by Channel Bandwidth. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 26 | A/B | As for the EVM vs Resource Block graph display data, each resource block's Peak EVM is returned with comma-separated value formats in the following order:<br>1. RB 0 EVM (Peak) applied to Subframe 0.<br>2. RB 1 EVM (Peak) applied to Subframe 0.<br>…<br>RB M–1 EVM (Peak) applied to M. Subframe 0.<br>RB 0 EVM (Peak) applied to M+1. Subframe 1.<br>…<br>RB M–1 EVM (Peak) applied to M×10. Subframe 9.<br><br>The unit of the response depends on the setting of EVM Unit (% or dB).<br>M: The number of resource block per 1 subframe, determined by Channel Bandwidth. |
| 27 | A/B | While displaying Trace Mode as Power/EVM vs Resource Block, the PDSCH Constellation display data is returned in the following order separated by commas (,).<br>1. N<br>2. I-phase data of PDSCH Resource Element 0<br>3. Q-phase data of PDSCH Resource Element 0<br>4. Subcarrier number of PDSCH Resource Element 0<br>5. Symbol number of PDSCH Resource Element 0<br>…<br>4×N–2. I-phase data of PDSCH Resource Element N<br>4×N–1. Q-phase data of PDSCH Resource Element N<br>4×N. Subcarrier number of PDSCH Resource Element N<br>4×N+1. Symbol number of PDSCH Resource Element N<br><br>N: The number of PDSCH resource elements within the designated resource block. |
| 28 | A/B | The Constellation of Reference Signal is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of RS Resource Element 0<br>3. Q-phase data of RS Resource Element 0<br>4. Subcarrier number of RS Resource Element 0<br>5. Symbol number of RS Resource Element 0<br>…<br>4×N–2. I-phase data of RS Resource Element N<br>4×N–1. Q-phase data of RS Resource Element N<br>4×N. Subcarrier number of RS Resource Element N<br>4×N+1. Symbol number of RS Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 29 | A/B | The Constellation of P-SS is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of P-SS Resource Element 0<br>3. Q-phase data of P-SS Resource Element 0<br>4. Subcarrier number of P-SS Resource Element 0<br>5. Symbol number of P-SS Resource Element 0<br>…<br>4×N–2. I-phase data of P-SS Resource Element N<br>4×N–1. Q-phase data of P-SS Resource Element N<br>4×N. Subcarrier number of P-SS Resource Element N<br>4×N+1. Symbol number of P-SS Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |
| 30 | A/B | The Constellation of S-SS is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of S-SS Resource Element 0<br>3. Q-phase data of S-SS Resource Element 0<br>4. Subcarrier number of S-SS Resource Element 0<br>5. Symbol number of S-SS Resource Element 0<br>…<br>4×N–2. I-phase data of S-SS Resource Element N<br>4×N–1. Q-phase data of S-SS Resource Element N<br>4×N Subcarrier number of S-SS Resource Element N<br>4×N+1. Symbol number of S-SS Resource Element N<br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 31 | A/B | The Constellation of PBCH is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of PBCH Resource Element 0<br>3. Q-phase data of PBCH Resource Element 0<br>4. Subcarrier number of PBCH Resource Element 0<br>5. Symbol number of PBCH Resource Element 0<br>…<br>4×N–2. I-phase data of PBCH Resource Element N<br>4×N–1. Q-phase data of PBCH Resource Element N<br>4×N. Subcarrier number of PBCH Resource Element N<br>4×N+1. Symbol number of PBCH Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |
| 32 | A/B | The Constellation of PDCCH is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of PDCCH Resource Element 0<br>3. Q-phase data of PDCCH Resource Element 0<br>4. Subcarrier number of PDCCH Resource Element 0<br>5. Symbol number of PDCCH Resource Element 0<br>…<br>4×N–2. I-phase data of PDCCH Resource Element N<br>4×N–1. Q-phase data of PDCCH Resource Element N<br>4×N. Subcarrier number of PDCCH Resource Element N<br>4×N+1. Symbol number of PDCCH Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 33 | A/B | The Constellation of PCFICH is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of PCFICH Resource Element 0<br>3. Q-phase data of PCFICH Resource Element 0<br>4. Subcarrier number of PCFICH Resource Element 0<br>5. Symbol number of PCFICH Resource Element 0<br>…<br>4×N–2. I-phase data of PCFICH Resource Element N<br>4×N–1. Q-phase data of PCFICH Resource Element N<br>Subcarrier number of PCFICH Resource Element N<br>4×N+1. Symbol number of PCFICH Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |
| 34 | A/B | The Constellation of PHICH is returned with comma-separated value formats in the following order:<br>1. N<br>2. I-phase data of PHICH Resource Element 0.<br>3. Q-phase data of PHICH Resource Element 0<br>4. Subcarrier number of PHICH Resource Element 0<br>5. Symbol number of PHICH Resource Element 0<br>…<br>4×N–2. I-phase data of PHICH Resource Element N<br>4×N–1. Q-phase data of PHICH Resource Element N<br>4×N. Subcarrier number of PHICH Resource Element N<br>4×N+1. Symbol number of PHICH Resource Element N<br><br>Number of Reference Signal resource elements included in 10 subframe of frame specified at N: Frame Offset.<br>Result can be obtained only by Remote control. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 35 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. RS Power (Average) [dBm]<br>2. RS Power (Maximum) [dBm]<br>3. P-SS Power (Average) [dBm]<br>4. P-SS Power (Average) [dB]<br>5. P-SS Power (Maximum) [dBm]<br>6. P-SS Power (Maximum) [dB]<br>7. S-SS Power (Average) [dBm]<br>8. S-SS Power (Average) [dB]<br>9. S-SS Power (Maximum) [dBm]<br>10. S-SS Power (Maximum) [dB]<br>11. PBCH Power (Average) [dBm]<br>12. PBCH Power (Average) [dB]<br>13. PBCH Power (Maximum) [dBm]<br>14. PBCH Power (Maximum) [dB]<br>15. PDCCH Power (Average) [dBm]<br>16. PDCCH Power (Average) [dB]<br>17. PDCCH Power (Maximum) [dBm]<br>18. PDCCH Power (Maximum) [dB]<br>19. PCFICH Power (Average) [dBm]<br>20. PCFICH Power (Average) [dB]<br>21. PCFICH Power (Maximum) [dBm]<br>22. PCFICH Power (Maximum) [dB]<br>23. PHICH Group Power (Average) [dBm]<br>24. PHICH Group Power (Average) [dB]<br>25. PHICH Group Power (Maximum) [dBm]<br>26. PHICH Group Power (Maximum) [dB] |

**Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)**

<table>
<tr><th>n</th><th>Result Mode</th><th>Response</th></tr>
<tr><td>36</td><td>A/B</td><td>The relative power of each PHICH, which is based on the PHICH Group Power, is returned with comma-separated value formats in the following order:<br>1. PHICH Group number of Subframe0<br>2. PHICH Power of Subframe0, Group 0, Sequence Index<br>3. PHICH Power of Subframe0, Group 0, Sequence Index 1<br>…<br>9. PHICH Power of Subframe0, Group 0, Sequence Index 7<br>10. PHICH Power of Subframe0, Group 1, Sequence Index 0<br>11. PHICH Power of Subframe0, Group 1, Sequence Index 1<br>…<br>$N_0 \times 8+1$.<br>PHICH Power of Subframe0, Group N0-1, Sequence Index 7<br>$N_0 \times 8+2$.<br>Subframe1 PHICH Group count N1<br>$N_0 \times 8+3$.<br>PHICH Power of Subframe1, Group 0, Sequence Index 0<br>…<br>$(N_0 + N_1 + \cdots + N_9) \times 8+10$.<br>PHICH Power of Subframe9, Group N–1, Sequence Index 7<br><br>Nx: The number of PHICH Group determined by Channel Bandwidth ,Uplink-downlink Configuration, and Ng.<br><br>–999.0 is returned when PHICH is set to Off.</td></tr>
<tr><td>37</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:<br>1. Power (Average) of Slot 0 [dBm]<br>2. Power (Average) of Slot 1 [dBm]<br>…<br>19. Power (Average) of Slot 18 [dBm]<br>20. Power (Average) of Slot 19 [dBm]<br>21. Power (Maximum) of Slot 0 [dBm]<br>22. Power (Maximum) of Slot 1 [dBm]<br>…<br>39. Power (Maximum) of Slot 18 [dBm]<br>40. Power (Maximum) of Slot 19 [dBm]<br>Note:<br>At measurement across multiple frames, returns value for results averaged between same slot number.</td></tr>
</table>

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 38 | A/B | OFDM Symbol Tx Power is returned with comma-separated value formats in the following order:<br>1. Subframe 0 OSTP (Average) [dBm]<br>2. Subframe 0 OSTP (Maximum) [dBm]<br>…<br>19. OSTP (Average) of Subframe 9 [dBm]<br>20. OSTP (Maximum) of Subframe 9 [dBm]<br>21. Average OSTP (Average) [dBm]<br>22. Average OSTP (Maximum) [dBm] |
| 39 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. RS Power (Average) of Subframe 0 [dBm]<br>2. RS Power (Maximum) of Subframe 0 [dBm]<br>…<br>19. RS Power (Average) of Subframe 9 [dBm]<br>20. RS Power (Maximum) of Subframe 9 [dBm]<br>21. Average RS Power (Average) [dBm]<br>22. Average RS Power (Maximum) [dBm] |
| 40 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Cell ID<br>2. Number of PDCCH Symbols (Subframe 1 and 6)<br>3. Number of PDCCH Symbols (Other subframes) |
| 41 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Frame Type of Subframe 0 (frame offset 0, Subframe 0)<br>2. Frame Type of Subframe 1 (frame offset 0, Subframe 1)<br>…<br>49. Frame Type of Subframe 48 (frame offset 4, Subframe 8)<br>50. Frame Type of Subframe 49 (frame offset 4, Subframe 9) |
| 42 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. RS boosting, $P_B = E_B/E_A$ of subframe 0 (Average)<br>2. RS boosting, $P_B = E_B/E_A$ of subfrAme 0 (Maximum)<br>…<br>99. RS boosting, $P_B = E_B/E_A$ of subframe 49 (Average)<br>100. RS boosting, $P_B = E_B/E_A$ of subfrAme 49 (Maximum)<br>101. RS boosting, $P_B = E_B/E_A$ between Measurement Interval (Average)<br>102. RS boosting, $P_B = E_B/E_A$ between Measurement IntervAl (MAximum) |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 43 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. P-SS EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. P-SS EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. P-SS EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. P-SS EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. P-SS EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. P-SS EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |
| 44 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. S-SS EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. S-SS EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. S-SS EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. S-SS EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. S-SS EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. S-SS EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |
| 45 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PBCH EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PBCH EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. PBCH EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PBCH EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. PBCH EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. PBCH EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |
| 46 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PCFICH EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PCFICH EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. PCFICH EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PCFICH EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. PCFICH EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. PCFICH EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 47 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PHICH EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PHICH EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PHICH EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PHICH EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. PHICH group EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. Average PHICH group EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |
| 48 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDCCH REG EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDCCH REG EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDCCH REG EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDCCH REG EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. PDCCH REG EPRE / $E_{RS}$ [dB] between Measurement Interval (Average)<br>102. Average PDCCH REG EPRE / $E_{RS}$ [dB] between Measurement Interval (Maximum) |
| 49 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH QPSK boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH QPSK boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDSCH QPSK boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH QPSK boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |
| 50 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH QPSK de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH QPSK de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDSCH QPSK de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH QPSK de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 51 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 16QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 16QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. PDSCH 16QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 16QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |
| 52 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 16QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 16QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. PDSCH 16QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 16QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |
| 53 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 64QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 64QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>…<br>99. PDSCH 64QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 64QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 54 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 64QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 64QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDSCH 64QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 64QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |
| 55 | A/B | Frame1 results are returned with comma-separated values in the following order when Test Model is E-TM1.2, 2, 2a, 3.2, and 3.3:<br>1. Frequency Error (Average) in Hz<br>2. Frequency Error (Maximum) in Hz<br>3. Frequency Error PPM (Average) in ppm<br>4. Frequency Error PPM (Maximum) in ppm<br>5. Output Power (Average) in dBm<br>6. Output Power (Maximum) in dBm<br>7. Mean Power (Average) in dBm<br>8. Mean Power (Maximum) in dBm<br>9. EVM rms (Average) in %<br>10. EVM rms (Maximum) in %<br>11. EVM peak (Average) in %<br>12. EVM peak (Maximum) in %<br>13. EVM peak Symbol Number<br>14. EVM peak Subcarrier Number<br>15. EVM peak Frame Number<br>16. Origin Offset (Average) in dB<br>17. Origin Offset (Maximum) in dB<br>18. Time Offset (Average) in seconds<br>19. Time Offset (Maximum) in seconds<br>20. Symbol Clock Error (Average) in ppm<br>21. Symbol Clock Error (Maximum) in ppm |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 56 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. Total EVM result valid (1 = valid/0 = invalid)<br>2. Total EVM rms (Average)<br>3. Total EVM rms (Maximum)<br>4. Total EVM peak (Average)<br>5. Total EVM peak (Maximum)<br>6. Total EVM peak Symbol Number<br>7. Total EVM peak Subcarrier Number<br>8. Total EVM peak Frame Number<br>9. Total EVM High rms (Average)<br>10. Total EVM High rms (Maximum)<br>11. Total EVM High peak (Average)<br>12. Total EVM High peak (Maximum)<br>13. Total EVM High peak Symbol Number<br>14. Total EVM High peak Subcarrier Number<br>15. Total EVM High peak Frame Number<br>16. Total EVM Low rms (Average)<br>17. Total EVM Low rms (Maximum)<br>18. Total EVM Low peak (Average)<br>19. Total EVM Low peak (Maximum)<br>20. Total EVM Low peak Symbol Number<br>21. Total EVM Low peak Subcarrier Number<br>22. Total EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 57 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH ALL EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH ALL EVM rms (Average)<br>3. PDSCH ALL EVM rms (Maximum)<br>4. PDSCH ALL EVM peak (Average)<br>5. PDSCH ALL EVM peak (Maximum)<br>6. PDSCH ALL EVM peak Symbol Number<br>7. PDSCH ALL EVM peak Subcarrier Number<br>8. PDSCH ALL EVM peak Frame Number<br>9. PDSCH ALL EVM High rms (Average)<br>10. PDSCH ALL EVM High rms (Maximum)<br>11. PDSCH ALL EVM High peak (Average)<br>12. PDSCH ALL EVM High peak (Maximum)<br>13. PDSCH ALL EVM High peak Symbol Number<br>14. PDSCH ALL EVM High peak Subcarrier Number<br>15. PDSCH ALL EVM High peak Frame Number<br>16. PDSCH ALL EVM Low rms (Average)<br>17. PDSCH ALL EVM Low rms (Maximum)<br>18. PDSCH ALL EVM Low peak (Average)<br>19. PDSCH ALL EVM Low peak (Maximum)<br>20. PDSCH ALL EVM Low peak Symbol Number<br>21. PDSCH ALL EVM Low peak Subcarrier Number<br>22. PDSCH ALL EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 58 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH QPSK EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH QPSK EVM rms (Average)<br>3. PDSCH QPSK EVM rms (Maximum)<br>4. PDSCH QPSK EVM peak (Average)<br>5. PDSCH QPSK EVM peak (Maximum)<br>6. PDSCH QPSK EVM peak Symbol Number<br>7. PDSCH QPSK EVM peak Subcarrier Number<br>8. PDSCH QPSK EVM peak Frame Number<br>9. PDSCH QPSK EVM High rms (Average)<br>10. PDSCH QPSK EVM High rms (Maximum)<br>11. PDSCH QPSK EVM High peak (Average)<br>12. PDSCH QPSK EVM High peak (Maximum)<br>13. PDSCH QPSK EVM High peak Symbol Number<br>14. PDSCH QPSK EVM High peak Subcarrier Number<br>15. PDSCH QPSK EVM High peak Frame Number<br>16. PDSCH QPSK EVM Low rms (Average)<br>17. PDSCH QPSK EVM Low rms (Maximum)<br>18. PDSCH QPSK EVM Low peak (Average)<br>19. PDSCH QPSK EVM Low peak (Maximum)<br>20. PDSCH QPSK EVM Low peak Symbol Number<br>21. PDSCH QPSK EVM Low peak Subcarrier Number<br>22. PDSCH QPSK EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 59 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 16QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 16QAM EVM rms (Average)<br>3. PDSCH 16QAM EVM rms (Maximum)<br>4. PDSCH 16QAM EVM peak (Average)<br>5. PDSCH 16QAM EVM peak (Maximum)<br>6. PDSCH 16QAM EVM peak Symbol Number<br>7. PDSCH 16QAM EVM peak Subcarrier Number<br>8. PDSCH 16QAM EVM peak Frame Number<br>9. PDSCH 16QAM EVM High rms (Average)<br>10. PDSCH 16QAM EVM High rms (Maximum)<br>11. PDSCH 16QAM EVM High peak (Average)<br>12. PDSCH 16QAM EVM High peak (Maximum)<br>13. PDSCH 16QAM EVM High peak Symbol Number<br>14. PDSCH 16QAM EVM High peak Subcarrier Number<br>15. PDSCH 16QAM EVM High peak Frame Number<br>16. PDSCH 16QAM EVM Low rms (Average)<br>17. PDSCH 16QAM EVM Low rms (Maximum)<br>18. PDSCH 16QAM EVM Low peak (Average)<br>19. PDSCH 16QAM EVM Low peak (Maximum)<br>20. PDSCH 16QAM EVM Low peak Symbol Number<br>21. PDSCH 16QAM EVM Low peak Subcarrier Number<br>22. PDSCH 16QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 60 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 64QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 64QAM EVM rms (Average)<br>3. PDSCH 64QAM EVM rms (Maximum)<br>4. PDSCH 64QAM EVM peak (Average)<br>5. PDSCH 64QAM EVM peak (Maximum)<br>6. PDSCH 64QAM EVM peak Symbol Number<br>7. PDSCH 64QAM EVM peak Subcarrier Number<br>8. PDSCH 64QAM EVM peak Frame Number<br>9. PDSCH 64QAM EVM High rms (Average)<br>10. PDSCH 64QAM EVM High rms (Maximum)<br>11. PDSCH 64QAM EVM High peak (Average)<br>12. PDSCH 64QAM EVM High peak (Maximum)<br>13. PDSCH 64QAM EVM High peak Symbol Number<br>14. PDSCH 64QAM EVM High peak Subcarrier Number<br>15. PDSCH 64QAM EVM High peak Frame Number<br>16. PDSCH 64QAM EVM Low rms (Average)<br>17. PDSCH 64QAM EVM Low rms (Maximum)<br>18. PDSCH 64QAM EVM Low peak (Average)<br>19. PDSCH 64QAM EVM Low peak (Maximum)<br>20. PDSCH 64QAM EVM Low peak Symbol Number<br>21. PDSCH 64QAM EVM Low peak Subcarrier Number<br>22. PDSCH 64QAM EVM Low peak Frame Number |

**Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)**

| N | Result Mode | Response |
|---|---|---|
| 61 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. RS EVM result valid (1 = valid/0 = invalid)<br>2. RS EVM rms (Average)<br>3. RS EVM rms (Maximum)<br>4. RS EVM peak (Average)<br>5. RS EVM peak (Maximum)<br>6. RS EVM peak Symbol Number<br>7. RS EVM peak Subcarrier Number<br>8. RS EVM peak Frame Number<br>9. RS EVM High rms (Average)<br>10. RS EVM High rms (Maximum)<br>11. RS EVM High peak (Average)<br>12. RS EVM High peak (Maximum)<br>13. RS EVM High peak Symbol Number<br>14. RS EVM High peak Subcarrier Number<br>15. RS EVM High peak Frame Number<br>16. RS EVM Low rms (Average)<br>17. RS EVM Low rms (Maximum)<br>18. RS EVM Low peak (Average)<br>19. RS EVM Low peak (Maximum)<br>20. RS EVM Low peak Symbol Number<br>21. RS EVM Low peak Subcarrier Number<br>22. RS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 62 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PBCH EVM result valid (1 = valid/0 = invalid)<br>2. PBCH EVM rms (Average)<br>3. PBCH EVM rms (Maximum)<br>4. PBCH EVM peak (Average)<br>5. PBCH EVM peak (Maximum)<br>6. PBCH EVM peak Symbol Number<br>7. PBCH EVM peak Subcarrier Number<br>8. PBCH EVM peak Frame Number<br>9. PBCH EVM High rms (Average)<br>10. PBCH EVM High rms (Maximum)<br>11. PBCH EVM High peak (Average)<br>12. PBCH EVM High peak (Maximum)<br>13. PBCH EVM High peak Symbol Number<br>14. PBCH EVM High peak Subcarrier Number<br>15. PBCH EVM High peak Frame Number<br>16. PBCH EVM Low rms (Average)<br>17. PBCH EVM Low rms (Maximum)<br>18. PBCH EVM Low peak (Average)<br>19. PBCH EVM Low peak (Maximum)<br>20. PBCH EVM Low peak Symbol Number<br>21. PBCH EVM Low peak Subcarrier Number<br>22. PBCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 63 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. P-SS EVM result valid (1 = valid/0 = invalid)<br>2. P-SS EVM rms (Average)<br>3. P-SS EVM rms (Maximum)<br>4. P-SS EVM peak (Average)<br>5. P-SS EVM peak (Maximum)<br>6. P-SS EVM peak Symbol Number<br>7. P-SS EVM peak Subcarrier Number<br>8. P-SS EVM peak Frame Number<br>9. P-SS EVM High rms (Average)<br>10. P-SS EVM High rms (Maximum)<br>11. P-SS EVM High peak (Average)<br>12. P-SS EVM High peak (Maximum)<br>13. P-SS EVM High peak Symbol Number<br>14. P-SS EVM High peak Subcarrier Number<br>15. P-SS EVM High peak Frame Number<br>16. P-SS EVM Low rms (Average)<br>17. P-SS EVM Low rms (Maximum)<br>18. P-SS EVM Low peak (Average)<br>19. P-SS EVM Low peak (Maximum)<br>20. P-SS EVM Low peak Symbol Number<br>21. P-SS EVM Low peak Subcarrier Number<br>22. P-SS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 64 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. S-SS EVM result valid (1 = valid/0 = invalid)<br>2. S-SS EVM rms (Average)<br>3. S-SS EVM rms (Maximum)<br>4. S-SS EVM peak (Average)<br>5. S-SS EVM peak (Maximum)<br>6. S-SS EVM peak Symbol Number<br>7. S-SS EVM peak Subcarrier Number<br>8. S-SS EVM peak Frame Number<br>9. S-SS EVM High rms (Average)<br>10. S-SS EVM High rms (Maximum)<br>11. S-SS EVM High peak (Average)<br>12. S-SS EVM High peak (Maximum)<br>13. S-SS EVM High peak Symbol Number<br>14. S-SS EVM High peak Subcarrier Number<br>15. S-SS EVM High peak Frame Number<br>16. S-SS EVM Low rms (Average)<br>17. S-SS EVM Low rms (Maximum)<br>18. S-SS EVM Low peak (Average)<br>19. S-SS EVM Low peak (Maximum)<br>20. S-SS EVM Low peak Symbol Number<br>21. S-SS EVM Low peak Subcarrier Number<br>22. S-SS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 65 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDCCH EVM result valid (1 = valid/0 = invalid)<br>2. PDCCH EVM rms (Average)<br>3. PDCCH EVM rms (Maximum)<br>4. PDCCH EVM peak (Average)<br>5. PDCCH EVM peak (Maximum)<br>6. PDCCH EVM peak Symbol Number<br>7. PDCCH EVM peak Subcarrier Number<br>8. PDCCH EVM peak Frame Number<br>9. PDCCH EVM High rms (Average)<br>10. PDCCH EVM High rms (Maximum)<br>11. PDCCH EVM High peak (Average)<br>12. PDCCH EVM High peak (Maximum)<br>13. PDCCH EVM High peak Symbol Number<br>14. PDCCH EVM High peak Subcarrier Number<br>15. PDCCH EVM High peak Frame Number<br>16. PDCCH EVM Low rms (Average)<br>17. PDCCH EVM Low rms (Maximum)<br>18. PDCCH EVM Low peak (Average)<br>19. PDCCH EVM Low peak (Maximum)<br>20. PDCCH EVM Low peak Symbol Number<br>21. PDCCH EVM Low peak Subcarrier Number<br>22. PDCCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 66 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PCFICH EVM result valid (1 = valid/0 = invalid)<br>2. PCFICH EVM rms (Average)<br>3. PCFICH EVM rms (Maximum)<br>4. PCFICH EVM peak (Average)<br>5. PCFICH EVM peak (Maximum)<br>6. PCFICH EVM peak Symbol Number<br>7. PCFICH EVM peak Subcarrier Number<br>8. PCFICH EVM peak Frame Number<br>9. PCFICH EVM High rms (Average)<br>10. PCFICH EVM High rms (Maximum)<br>11. PCFICH EVM High peak (Average)<br>12. PCFICH EVM High peak (Maximum)<br>13. PCFICH EVM High peak Symbol Number<br>14. PCFICH EVM High peak Subcarrier Number<br>15. PCFICH EVM High peak Frame Number<br>16. PCFICH EVM Low rms (Average)<br>17. PCFICH EVM Low rms (Maximum)<br>18. PCFICH EVM Low peak (Average)<br>19. PCFICH EVM Low peak (Maximum)<br>20. PCFICH EVM Low peak Symbol Number<br>21. PCFICH EVM Low peak Subcarrier Number<br>22. PCFICH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 67 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PHICH EVM result valid (1 = valid/0 = invalid)<br>2. PHICH EVM rms (Average)<br>3. PHICH EVM rms (Maximum)<br>4. PHICH EVM peak (Average)<br>5. PHICH EVM peak (Maximum)<br>6. PHICH EVM peak Symbol Number<br>7. PHICH EVM peak Subcarrier Number<br>8. PHICH EVM peak Frame Number<br>9. PHICH EVM High rms (Average)<br>10. PHICH EVM High rms (Maximum)<br>11. PHICH EVM High peak (Average)<br>12. PHICH EVM High peak (Maximum)<br>13. PHICH EVM High peak Symbol Number<br>14. PHICH EVM High peak Subcarrier Number<br>15. PHICH EVM High peak Frame Number<br>16. PHICH EVM Low rms (Average)<br>17. PHICH EVM Low rms (Maximum)<br>18. PHICH EVM Low peak (Average)<br>19. PHICH EVM Low peak (Maximum)<br>20. PHICH EVM Low peak Symbol Number<br>21. PHICH EVM Low peak Subcarrier Number<br>22. PHICH EVM Low peak Frame Number |
| 68 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. Power (Average) of Slot 0 [dBm]<br>2. Power (Average) of Slot 1 [dBm]<br>…<br>19. Power (Average) of Slot 18 [dBm]<br>20. Power (Average) of Slot 19 [dBm]<br>21. Power (Maximum) of Slot 0 [dBm]<br>22. Power (Maximum) of Slot 1 [dBm]<br>…<br>39. Power (Maximum) of Slot 18 [dBm]<br>40. Power (Maximum) of Slot 19 [dBm]<br>***Note:***<br>At measurement across multiple frames, returns value for results averaged between same slot number. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 69 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. Subframe 0 OSTP (Average) [dBm]<br>2. Subframe 0 OSTP (Maximum)[dBm]<br>…<br>19. OSTP (Average) of Subframe 9 [dBm]<br>20. OSTP (Maximum) of Subframe 9 [dBm]<br>21.Average OSTP (Average) [dBm]<br>22.Average OSTP (Maximum) [dBm] |
| 70 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. RS Power (Average) of Subframe 0 [dBm]<br>2. RS Power (Maximum) of Subframe 0 [dBm]<br>…<br>19. RS Power (Average) of Subframe 9 [dBm]<br>20. RS Power (Maximum) of Subframe 9 [dBm]<br>21. Average RS Power (Average) [dBm]<br>22. Average RS Power (Maximum) [dBm] |
| 71 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order when Test Mode is E-TM1.2, 2, 2a, 3.2, 3.3:<br>1. Frequency Error (Average in Hz<br>2. Frequency Error (Maximum) in Hz<br>3. Frequency Error PPM (Average) in ppm<br>4. Frequency Error PPM (Maximum) in ppm<br>5. Output Power (Average) in dBm<br>6. Output Power (Maximum) in dBm<br>7. Mean Power (Average) in dBm<br>8. Mean Power (Maximum) in dBm<br>9. EVM rms (Average) in %<br>10. EVM rms (Maximum) in %<br>11. EVM peak (Average) in %<br>12. EVM peak (Maximum) in %<br>13. EVM peak Symbol Number<br>14. EVM peak Subcarrier Number<br>15. EVM peak Frame Number<br>16. Origin Offset (Average) in dB<br>17. Origin Offset (Maximum) in dB<br>18. Time Offset (Average) in seconds<br>19. Time Offset (Maximum) in seconds<br>20. Symbol Clock Error (Average) in ppm<br>21. Symbol Clock Error (Maximum) in ppm |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 72 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. Total EVM result valid (1 = valid/0 = invalid)<br>2. Total EVM rms (Average)<br>3. Total EVM rms (Maximum)<br>4. Total EVM peak (Average)<br>5. Total EVM peak (Maximum)<br>6. Total EVM peak Symbol Number<br>7. Total EVM peak Subcarrier Number<br>8. Total EVM peak Frame Number<br>9. Total EVM High rms (Average)<br>10. Total EVM High rms (Maximum)<br>11. Total EVM High peak (Average)<br>12. Total EVM High peak (Maximum)<br>13. Total EVM High peak Symbol Number<br>14. Total EVM High peak Subcarrier Number<br>15. Total EVM High peak Frame Number<br>16. Total EVM Low rms (Average)<br>17. Total EVM Low rms (Maximum)<br>18. Total EVM Low peak (Average)<br>19. Total EVM Low peak (Maximum)<br>20. Total EVM Low peak Symbol Number<br>21. Total EVM Low peak Subcarrier Number<br>22. Total EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 73 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH ALL EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH ALL EVM rms (Average)<br>3. PDSCH ALL EVM rms (Maximum)<br>4. PDSCH ALL EVM peak (Average)<br>5. PDSCH ALL EVM peak (Maximum)<br>6. PDSCH ALL EVM peak Symbol Number<br>7. PDSCH ALL EVM peak Subcarrier Number<br>8. PDSCH ALL EVM peak Frame Number<br>9. PDSCH ALL EVM High rms (Average)<br>10. PDSCH ALL EVM High rms (Maximum)<br>11. PDSCH ALL EVM High peak (Average)<br>12. PDSCH ALL EVM High peak (Maximum)<br>13. PDSCH ALL EVM High peak Symbol Number<br>14. PDSCH ALL EVM High peak Subcarrier Number<br>15. PDSCH ALL EVM High peak Frame Number<br>16. PDSCH ALL EVM Low rms (Average)<br>17. PDSCH ALL EVM Low rms (Maximum)<br>18. PDSCH ALL EVM Low peak (Average)<br>19. PDSCH ALL EVM Low peak (Maximum)<br>20. PDSCH ALL EVM Low peak Symbol Number<br>21. PDSCH ALL EVM Low peak Subcarrier Number<br>22. PDSCH ALL EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 74 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH QPSK EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH QPSK EVM rms (Average)<br>3. PDSCH QPSK EVM rms (Maximum)<br>4. PDSCH QPSK EVM peak (Average)<br>5. PDSCH QPSK EVM peak (Maximum)<br>6. PDSCH QPSK EVM peak Symbol Number<br>7. PDSCH QPSK EVM peak Subcarrier Number<br>8. PDSCH QPSK EVM peak Frame Number<br>9. PDSCH QPSK EVM High rms (Average)<br>10. PDSCH QPSK EVM High rms (Maximum)<br>11. PDSCH QPSK EVM High peak (Average)<br>12. PDSCH QPSK EVM High peak (Maximum)<br>13. PDSCH QPSK EVM High peak Symbol Number<br>14. PDSCH QPSK EVM High peak Subcarrier Number<br>15. PDSCH QPSK EVM High peak Frame Number<br>16. PDSCH QPSK EVM Low rms (Average)<br>17. PDSCH QPSK EVM Low rms (Maximum)<br>18. PDSCH QPSK EVM Low peak (Average)<br>19. PDSCH QPSK EVM Low peak (Maximum)<br>20. PDSCH QPSK EVM Low peak Symbol Number<br>21. PDSCH QPSK EVM Low peak Subcarrier Number<br>22. PDSCH QPSK EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 75 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 16QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 16QAM EVM rms (Average)<br>3. PDSCH 16QAM EVM rms (Maximum)<br>4. PDSCH 16QAM EVM peak (Average)<br>5. PDSCH 16QAM EVM peak (Maximum)<br>6. PDSCH 16QAM EVM peak Symbol Number<br>7. PDSCH 16QAM EVM peak Subcarrier Number<br>8. PDSCH 16QAM EVM peak Frame Number<br>9. PDSCH 16QAM EVM High rms (Average)<br>10. PDSCH 16QAM EVM High rms (Maximum)<br>11. PDSCH 16QAM EVM High peak (Average)<br>12. PDSCH 16QAM EVM High peak (Maximum)<br>13. PDSCH 16QAM EVM High peak Symbol Number<br>14. PDSCH 16QAM EVM High peak Subcarrier Number<br>15. PDSCH 16QAM EVM High peak Frame Number<br>16. PDSCH 16QAM EVM Low rms (Average)<br>17. PDSCH 16QAM EVM Low rms (Maximum)<br>18. PDSCH 16QAM EVM Low peak (Average)<br>19. PDSCH 16QAM EVM Low peak (Maximum)<br>20. PDSCH 16QAM EVM Low peak Symbol Number<br>21. PDSCH 16QAM EVM Low peak Subcarrier Number<br>22. PDSCH 16QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 76 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 64QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 64QAM EVM rms (Average)<br>3. PDSCH 64QAM EVM rms (Maximum)<br>4. PDSCH 64QAM EVM peak (Average)<br>5. PDSCH 64QAM EVM peak (Maximum)<br>6. PDSCH 64QAM EVM peak Symbol Number<br>7. PDSCH 64QAM EVM peak Subcarrier Number<br>8. PDSCH 64QAM EVM peak Frame Number<br>9. PDSCH 64QAM EVM High rms (Average)<br>10. PDSCH 64QAM EVM High rms (Maximum)<br>11. PDSCH 64QAM EVM High peak (Average)<br>12. PDSCH 64QAM EVM High peak (Maximum)<br>13. PDSCH 64QAM EVM High peak Symbol Number<br>14. PDSCH 64QAM EVM High peak Subcarrier Number<br>15. PDSCH 64QAM EVM High peak Frame Number<br>16. PDSCH 64QAM EVM Low rms (Average)<br>17. PDSCH 64QAM EVM Low rms (Maximum)<br>18. PDSCH 64QAM EVM Low peak (Average)<br>19. PDSCH 64QAM EVM Low peak (Maximum)<br>20. PDSCH 64QAM EVM Low peak Symbol Number<br>21. PDSCH 64QAM EVM Low peak Subcarrier Number<br>22. PDSCH 64QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 77 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. RS EVM result valid (1 = valid/0 = invalid)<br>2. RS EVM rms (Average)<br>3. RS EVM rms (Maximum)<br>4. RS EVM peak (Average)<br>5. RS EVM peak (Maximum)<br>6. RS EVM peak Symbol Number<br>7. RS EVM peak Subcarrier Number<br>8. RS EVM peak Frame Number<br>9. RS EVM High rms (Average)<br>10. RS EVM High rms (Maximum)<br>11. RS EVM High peak (Average)<br>12. RS EVM High peak (Maximum)<br>13. RS EVM High peak Symbol Number<br>14. RS EVM High peak Subcarrier Number<br>15. RS EVM High peak Frame Number<br>16. RS EVM Low rms (Average)<br>17. RS EVM Low rms (Maximum)<br>18. RS EVM Low peak (Average)<br>19. RS EVM Low peak (Maximum)<br>20. RS EVM Low peak Symbol Number<br>21. RS EVM Low peak Subcarrier Number<br>22. RS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 78 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PBCH EVM result valid (1 = valid/0 = invalid)<br>2. PBCH EVM rms (Average)<br>3. PBCH EVM rms (Maximum)<br>4. PBCH EVM peak (Average)<br>5. PBCH EVM peak (Maximum)<br>6. PBCH EVM peak Symbol Number<br>7. PBCH EVM peak Subcarrier Number<br>8. PBCH EVM peak Frame Number<br>9. PBCH EVM High rms (Average)<br>10. PBCH EVM High rms (Maximum)<br>11. PBCH EVM High peak (Average)<br>12. PBCH EVM High peak (Maximum)<br>13. PBCH EVM High peak Symbol Number<br>14. PBCH EVM High peak Subcarrier Number<br>15. PBCH EVM High peak Frame Number<br>16. PBCH EVM Low rms (Average)<br>17. PBCH EVM Low rms (Maximum)<br>18. PBCH EVM Low peak (Average)<br>19. PBCH EVM Low peak (Maximum)<br>20. PBCH EVM Low peak Symbol Number<br>21. PBCH EVM Low peak Subcarrier Number<br>22. PBCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 79 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. P-SS EVM result valid (1 = valid/0 = invalid)<br>2. P-SS EVM rms (Average)<br>3. P-SS EVM rms (Maximum)<br>4. P-SS EVM peak (Average)<br>5. P-SS EVM peak (Maximum)<br>6. P-SS EVM peak Symbol Number<br>7. P-SS EVM peak Subcarrier Number<br>8. P-SS EVM peak Frame Number<br>9. P-SS EVM High rms (Average)<br>10. P-SS EVM High rms (Maximum)<br>11. P-SS EVM High peak (Average)<br>12. P-SS EVM High peak (Maximum)<br>13. P-SS EVM High peak Symbol Number<br>14. P-SS EVM High peak Subcarrier Number<br>15. P-SS EVM High peak Frame Number<br>16. P-SS EVM Low rms (Average)<br>17. P-SS EVM Low rms (Maximum)<br>18. P-SS EVM Low peak (Average)<br>19. P-SS EVM Low peak (Maximum)<br>20. P-SS EVM Low peak Symbol Number<br>21. P-SS EVM Low peak Subcarrier Number<br>22. P-SS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 80 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. S-SS EVM result valid (1 = valid/0 = invalid)<br>2. S-SS EVM rms (Average)<br>3. S-SS EVM rms (Maximum)<br>4. S-SS EVM peak (Average)<br>5. S-SS EVM peak (Maximum)<br>6. S-SS EVM peak Symbol Number<br>7. S-SS EVM peak Subcarrier Number<br>8. S-SS EVM peak Frame Number<br>9. S-SS EVM High rms (Average)<br>10. S-SS EVM High rms (Maximum)<br>11. S-SS EVM High peak (Average)<br>12. S-SS EVM High peak (Maximum)<br>13. S-SS EVM High peak Symbol Number<br>14. S-SS EVM High peak Subcarrier Number<br>15. S-SS EVM High peak Frame Number<br>16. S-SS EVM Low rms (Average)<br>17. S-SS EVM Low rms (Maximum)<br>18. S-SS EVM Low peak (Average)<br>19. S-SS EVM Low peak (Maximum)<br>20. S-SS EVM Low peak Symbol Number<br>21. S-SS EVM Low peak Subcarrier Number<br>22. S-SS EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 81 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDCCH EVM result valid (1 = valid/0 = invalid)<br>2. PDCCH EVM rms (Average)<br>3. PDCCH EVM rms (Maximum)<br>4. PDCCH EVM peak (Average)<br>5. PDCCH EVM peak (Maximum)<br>6. PDCCH EVM peak Symbol Number<br>7. PDCCH EVM peak Subcarrier Number<br>8. PDCCH EVM peak Frame Number<br>9. PDCCH EVM High rms (Average)<br>10. PDCCH EVM High rms (Maximum)<br>11. PDCCH EVM High peak (Average)<br>12. PDCCH EVM High peak (Maximum)<br>13. PDCCH EVM High peak Symbol Number<br>14. PDCCH EVM High peak Subcarrier Number<br>15. PDCCH EVM High peak Frame Number<br>16. PDCCH EVM Low rms (Average)<br>17. PDCCH EVM Low rms (Maximum)<br>18. PDCCH EVM Low peak (Average)<br>19. PDCCH EVM Low peak (Maximum)<br>20. PDCCH EVM Low peak Symbol Number<br>21. PDCCH EVM Low peak Subcarrier Number<br>22. PDCCH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 82 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PCFICH EVM result valid (1 = valid/0 = invalid)<br>2. PCFICH EVM rms (Average)<br>3. PCFICH EVM rms (Maximum)<br>4. PCFICH EVM peak (Average)<br>5. PCFICH EVM peak (Maximum)<br>6. PCFICH EVM peak Symbol Number<br>7. PCFICH EVM peak Subcarrier Number<br>8. PCFICH EVM peak Frame Number<br>9. PCFICH EVM High rms (Average)<br>10. PCFICH EVM High rms (Maximum)<br>11. PCFICH EVM High peak (Average)<br>12. PCFICH EVM High peak (Maximum)<br>13. PCFICH EVM High peak Symbol Number<br>14. PCFICH EVM High peak Subcarrier Number<br>15. PCFICH EVM High peak Frame Number<br>16. PCFICH EVM Low rms (Average)<br>17. PCFICH EVM Low rms (Maximum)<br>18. PCFICH EVM Low peak (Average)<br>19. PCFICH EVM Low peak (Maximum)<br>20. PCFICH EVM Low peak Symbol Number<br>21. PCFICH EVM Low peak Subcarrier Number<br>22. PCFICH EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 83 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PHICH EVM result valid (1 = valid/0 = invalid)<br>2. PHICH EVM rms (Average)<br>3. PHICH EVM rms (Maximum)<br>4. PHICH EVM peak (Average)<br>5. PHICH EVM peak (Maximum)<br>6. PHICH EVM peak Symbol Number<br>7. PHICH EVM peak Subcarrier Number<br>8. PHICH EVM peak Frame Number<br>9. PHICH EVM High rms (Average)<br>10. PHICH EVM High rms (Maximum)<br>11. PHICH EVM High peak (Average)<br>12. PHICH EVM High peak (Maximum)<br>13. PHICH EVM High peak Symbol Number<br>14. PHICH EVM High peak Subcarrier Number<br>15. PHICH EVM High peak Frame Number<br>16. PHICH EVM Low rms (Average)<br>17. PHICH EVM Low rms (Maximum)<br>18. PHICH EVM Low peak (Average)<br>19. PHICH EVM Low peak (Maximum)<br>20. PHICH EVM Low peak Symbol Number<br>21. PHICH EVM Low peak Subcarrier Number<br>22. PHICH EVM Low peak Frame Number |
| 84 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. Power (Average) of Slot 0 [dBm]<br>2. Power (Average) of Slot 1 [dBm]<br>…<br>19. Power (Average) of Slot 18 [dBm]<br>20. Power (Average) of Slot 19 [dBm]<br>21. Power (Maximum) of Slot 0 [dBm]<br>22. Power (Maximum) of Slot 1 [dBm]<br>…<br>39. Power (Maximum) of Slot 18 [dBm]<br>40. Power (Maximum) of Slot 19 [dBm]<br>***Note:***<br>At measurement across multiple frames, returns value for results averaged between same slot number. |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 85 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. Subframe 0 OSTP (Average) [dBm]<br>2. Subframe 0 OSTP (Maximum) [dBm]<br>…<br>19. OSTP (Average) of Subframe 9 [dBm]<br>20. OSTP (Maximum) of Subframe 9 [dBm]<br>21. Average OSTP (Average) [dBm]<br>22. Average OSTP (Maximum) [dBm] |
| 86 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. RS Power (Average) of Subframe 0 [dBm]<br>2. RS Power (Maximum) of Subframe 0 [dBm]<br>…<br>19. RS Power (Average) of Subframe 9 [dBm]<br>20. RS Power (Maximum) of Subframe 9 [dBm]<br>21. Average RS Power (Average) [dBm]<br>22. Average RS Power (Maximum) [dBm] |
| 87 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 256QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 256QAM EVM rms (Average)<br>3. PDSCH 256QAM EVM rms (Maximum)<br>4. PDSCH 256QAM EVM peak (Average)<br>5. PDSCH 256QAM EVM peak (Maximum)<br>6. PDSCH 256QAM EVM peak Symbol Number<br>7. PDSCH 256QAM EVM peak Subcarrier Number<br>8. PDSCH 256QAM EVM peak Frame Number<br>9. PDSCH 256QAM EVM High rms (Average)<br>10. PDSCH 256QAM EVM High rms (Maximum)<br>11. PDSCH 256QAM EVM High peak (Average)<br>12. PDSCH 256QAM EVM High peak (Maximum)<br>13. PDSCH 256QAM EVM High peak Symbol Number<br>14. PDSCH 256QAM EVM High peak Subcarrier Number<br>15. PDSCH 256QAM EVM High peak Frame Number<br>16. PDSCH 256QAM EVM Low rms (Average)<br>17. PDSCH 256QAM EVM Low rms (Maximum)<br>18. PDSCH 256QAM EVM Low peak (Average)<br>19. PDSCH 256QAM EVM Low peak (Maximum)<br>20. PDSCH 256QAM EVM Low peak Symbol Number<br>21. PDSCH 256QAM EVM Low peak Subcarrier Number<br>22. PDSCH 256QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 88 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 256QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 256QAM boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDSCH 256QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 256QAM boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |
| 89 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. PDSCH 256QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Average)<br>2. PDSCH 256QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 0 (Maximum)<br>...<br>99. PDSCH 256QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Average)<br>100. PDSCH 256QAM de-boosted EPRE / $E_{RS}$ [dB] of subframe 49 (Maximum)<br>101. –999.0<br>102. –999.0 |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 90 | A/B | Frame 1 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 256QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 256QAM EVM rms (Average)<br>3. PDSCH 256QAM EVM rms (Maximum)<br>4. PDSCH 256QAM EVM peak (Average)<br>5. PDSCH 256QAM EVM peak (Maximum)<br>6. PDSCH 256QAM EVM peak Symbol Number<br>7. PDSCH 256QAM EVM peak Subcarrier Number<br>8. PDSCH 256QAM EVM peak Frame Number<br>9. PDSCH 256QAM EVM High rms (Average)<br>10. PDSCH 256QAM EVM High rms (Maximum)<br>11. PDSCH 256QAM EVM High peak (Average)<br>12. PDSCH 256QAM EVM High peak (Maximum)<br>13. PDSCH 256QAM EVM High peak Symbol Number<br>14. PDSCH 256QAM EVM High peak Subcarrier Number<br>15. PDSCH 256QAM EVM High peak Frame Number<br>16. PDSCH 256QAM EVM Low rms (Average)<br>17. PDSCH 256QAM EVM Low rms (Maximum)<br>18. PDSCH 256QAM EVM Low peak (Average)<br>19. PDSCH 256QAM EVM Low peak (Maximum)<br>20. PDSCH 256QAM EVM Low peak Symbol Number<br>21. PDSCH 256QAM EVM Low peak Subcarrier Number<br>22. PDSCH 256QAM EVM Low peak Frame Number |

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 91 | A/B | Frame 2 measurement results are returned with comma-separated value formats in the following order:<br>1. PDSCH 256QAM EVM result valid (1 = valid/0 = invalid)<br>2. PDSCH 256QAM EVM rms (Average)<br>3. PDSCH 256QAM EVM rms (Maximum)<br>4. PDSCH 256QAM EVM peak (Average)<br>5. PDSCH 256QAM EVM peak (Maximum)<br>6. PDSCH 256QAM EVM peak Symbol Number<br>7. PDSCH 256QAM EVM peak Subcarrier Number<br>8. PDSCH 256QAM EVM peak Frame Number<br>9. PDSCH 256QAM EVM High rms (Average)<br>10. PDSCH 256QAM EVM High rms (Maximum)<br>11. PDSCH 256QAM EVM High peak (Average)<br>12. PDSCH 256QAM EVM High peak (Maximum)<br>13. PDSCH 256QAM EVM High peak Symbol Number<br>14. PDSCH 256QAM EVM High peak Subcarrier Number<br>15. PDSCH 256QAM EVM High peak Frame Number<br>16. PDSCH 256QAM EVM Low rms (Average)<br>17. PDSCH 256QAM EVM Low rms (Maximum)<br>18. PDSCH 256QAM EVM Low peak (Average)<br>19. PDSCH 256QAM EVM Low peak (Maximum)<br>20. PDSCH 256QAM EVM Low peak Symbol Number<br>21. PDSCH 256QAM EVM Low peak Subcarrier Number<br>22. PDSCH 256QAM EVM Low peak Frame Number |

For details on Result Mode, refer to the description of the `:SYSTem:RESult:MODE` command in the *MS2690A/MS2691A/MS2692A or MS2830A/MS2840A Signal Analyzer Operation Manual (Mainframe Remote Control)*.

Table 2.8-3 lists device messages for setting parameters for Modulation measurement.

**Table 2.8-3 Device Messages for Setting Parameters for Modulation Measurement**

| Parameter | Device message |
|---|---|
| Storage Mode | `[:SENSe]:EVM:AVERage[:STATe] OFF\|ON\|AMAXimum\|0\|1\|2` |
| | `[:SENSe]:EVM:AVERage[:STATe]?` |
| Storage Count | `[:SENSe]:EVM:AVERage:COUNt <integer>` |
| | `[:SENSe]:EVM:AVERage:COUNt?` |
| Scale–EVM Unit | `:DISPlay:EVM[:VIEW]:WINDow2\|3\|5\|6\|7:TRACe:Y[:SCALe]:SPACing LINear\|LOGarithmic\|PERCent\|DB` |
| | `:DISPlay:EVM[:VIEW]:WINDow2\|3\|5\|6\|7:TRACe:Y[:SCALe]:SPACing?` |
| Scale–EVM | `:DISPlay:EVM[:VIEW]:WINDow2\|3\|6:TRACe:Y[:SCALe]:RLEVel 2\|5\|10\|20\|-40\|-20\|0` |
| | `:DISPlay:EVM[:VIEW]:WINDow2\|3\|6:TRACe:Y[:SCALe]:RLEVel?` |
| Scale–Flatness | `:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 10\|3\|1\|0.3\|0.1\|60\|20\|6\|50\|100` |
| | `:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?` |
| Trace Mode | `:DISPlay:EVM[:VIEW]:SELect EVSubcarrier\|EVSYmbol\|FLATness\|PVRB\|EVRB\|SUMMary` |
| | `:DISPlay:EVM[:VIEW]:SELect?` |
| Flatness Type | `:CALCulate:EVM:WINDow4:TYPE AMPLitude\|DAMPlitude\|PHASe\|GDELay` |
| | `:CALCulate:EVM:WINDow4:TYPE?` |

Table 2.8-3 Device Messages for Setting Parameters for Modulation Measurement (Cont'd)

| Parameter | Device Message |
|---|---|
| Graph View Setting | :CALCulate:EVM:WINDow2:MODE EACH\|AVERage |
| | :CALCulate:EVM:WINDow2:MODE? |
| | :CALCulate:EVM:WINDow2:GVIew RMS\|RPEak |
| | :CALCulate:EVM:WINDow2:GVIew? |
| | :CALCulate:EVM:WINDow3:MODE EACH\|AVERage |
| | :CALCulate:EVM:WINDow3:MODE? |
| | :CALCulate:EVM:WINDow3:GVIew RMS\|RPEak |
| | :CALCulate:EVM:WINDow3:GVIew? |
| | :CALCulate:EVM:WINDow5:MODE EACH\|ALL |
| | :CALCulate:EVM:WINDow5:MODE? |
| | :CALCulate:EVM:WINDow5:GVIew RMS\|RPEak |
| | :CALCulate:EVM:WINDow5:GVIew? |
| | :CALCulate:EVM:WINDow6:GVIew RMS\|RPEak |
| | :CALCulate:EVM:WINDow6:GVIew? |
| Constellation Display Range | :DISPlay:EVM[:VIEW]:WINDow[1]:RANGe SYMBol\|COMPosite |
| | :DISPlay:EVM[:VIEW]:WINDow[1]:RANGe? |
| Constellation Symbol Number | :CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer> |
| | :CALCulate:EVM:WINDow[1]:SYMBol:NUMBer? |
| Bottom Graph Symbol Number | :CALCulate:EVM:WINDow2:SYMBol:NUMBer <integer> |
| | :CALCulate:EVM:WINDow2:SYMBol:NUMBer? |
| EVM vs Symbol Subcarrier Number | :CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer> |
| | :CALCulate:EVM:WINDow3:SUBCarrier:NUMBer? |
| Subframe Number | :CALCulate:EVM:WINDow5\|6:SUBFrame:NUMBer <integer> |
| | :CALCulate:EVM:WINDow5\|6:SUBFrame:NUMBer? |
| Resource Block Number | :CALCulate:EVM:WINDow5\|6:RBLock:NUMBer <integer> |
| | :CALCulate:EVM:WINDow5\|6:RBLock:NUMBer? |
| Display Page | :DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer> |
| | :DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer? |
| Frame Offset | :DISPlay:EVM[:VIEW]:WINDow[1]\|2\|3\|4\|5\|6:TRACe:X:FRAMe:OFFSet <integer> |
| | :DISPlay:EVM[:VIEW]:WINDow[1]\|2\|3\|4\|5\|6:TRACe:X:FRAMe:OFFSet? |

Table 2.8-4 lists the device messages for setting the marker and reading out the value at the marker position for Modulation measurement.

**Table 2.8-4 Device Messages Related to Marker for Modulation Measurement**

| Parameter | Device Message |
|---|---|
| Marker – On/Off | :CALCulate:EVM:MARKer[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:EVM:MARKer[:STATe]? |
| Active Trace | :CALCulate:EVM:MARKer:ACTive CONStellation\|BOTTom |
| | :CALCulate:EVM:MARKer:ACTive? |
| Marker Position Number | :CALCulate:EVM:MARKer:SUBCarrier <integer> |
| | :CALCulate:EVM:MARKer:SUBCarrier? |
| | :CALCulate:EVM:MARKer:SYMBol <integer> |
| | :CALCulate:EVM:MARKer:SYMBol? |
| | :CALCulate:EVM:MARKer:RELement <integer> |
| | :CALCulate:EVM:MARKer:RELement? |
| Marker Value | :CALCulate:EVM:MARKer:X? |
| | :CALCulate:EVM:MARKer:Y[:RMS]? |
| | :CALCulate:EVM:MARKer:Y:PEAK? |
| | :CALCulate:EVM:MARKer:EVM[:RMS]? |
| | :CALCulate:EVM:MARKer:EVM:PEAK? |
| | :CALCulate:EVM:MARKer:POWer[:RELative]? |
| | :CALCulate:EVM:MARKer:POWer:ABSolute? |
| Peak Search | :CALCulate:MARKer:MAXimum |
| Next Peak Search | :CALCulate:MARKer:MAXimum:NEXT |
| Dip Search | :CALCulate:MARKer:MINimum |
| Next Dip Search | :CALCulate:MARKer:MINimum:NEXT |

## 2.8.1 Measure

### :CONFigure:EVM

Modulation

Function

This command selects the Modulation measurement function.

Command

```
:CONFigure:EVM
```

Details

This command only selects the measurement function and does not start measurement.

Example of Use

To select the Modulation measurement function.

```
CONF:EVM
```

### :INITiate:EVM

Modulation

Function

This command starts Modulation measurement.

Command

```
:INITiate:EVM
```

Example of Use

To start Modulation measurement.

```
INIT:EVM
```

## :FETCh:EVM[n]?

Modulation Query

### Function

This command queries the result of Modulation measurement.

### Query

```
:FETCh:EVM[n]?
```

### Response

See Table 2.8-2.

### Details

–999.0 is returned when measurement is not performed or an error has occurred. Note, however, that “999999999999” is returned in the case of Frequency Error.

### Example of Use

To query the result of Modulation measurement.

```
FETC:EVM?
```

## :READ:EVM[n]?

Modulation Query

### Function

This command performs Modulation measurement once (single measurement) with the current settings, and then queries the measured result.

### Query

```
:READ:EVM[n]?
```

### Response

See Table 2.8-2.

### Example of Use

To perform Modulation measurement and queries the measured result.

```
READ:EVM?
```

### Related Command

This command functions the same as the following command.

```
:MEASure:EVM[n]?
```

## :MEASure:EVM[n]?

Modulation Query

### Function

This command performs Modulation measurement once (single measurement) with the current settings, and then queries the measured result.

### Query

```
:MEASure:EVM[n]?
```

### Response

See Table 2.8-2.

### Example of Use

To perform Modulation measurement and query the measurement result.

```
MEAS:EVM?
```

### Related Command

This command functions the same as the following command.

```
READ:EVM[n]?
```

## 2.8.2 Storage Mode

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

Storage Mode

**Function**

This command sets the storage mode.

**Command**

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

**Parameter**

| | |
|---|---|
| `<mode>` | Storage Mode |
| `OFF|0` | Off (Default) |
| `ON|1` | Average |
| `AMAXimum|2` | Average & Max |

**Example of Use**

To set the storage mode to Average.

`EVM:AVER ON`

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

Storage Mode Query

**Function**

This command queries the storage mode.

**Query**

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

**Response**

`<mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | Storage Mode |
| `0` | Off |
| `1` | Average |
| `2` | Average & Max |

**Example of Use**

To query the storage mode.

```
EVM:AVER?
> 1
```

### 2.8.3 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

When Capture Time Auto is On: 2 to 9999

When Capture Time Auto is Off: 2 to Capture Time Length/5

Resolution 1

Default value 10

Example of Use

To set the storage count to 10.

```
EVM:AVER:COUN 10
```

## [:SENSe]:EVM:AVERage:COUNt?

Storage Count Query

### Function

This command queries the storage count.

### Query

```
[:SENSe]:EVM:AVERage:COUNt?
```

### Response

```
<integer>
```

### Parameter

`<integer>` Storage Count

Range

When Capture Time Auto is On: 2 to 9999

When Capture Time Auto is Off: 2 to Capture Time Length/5

Resolution 1

### Example of Use

To query the storage count.

```
EVM:AVER:COUN?
> 10
```

## 2.8.4 Scale – EVM Unit

:DISPlay:EVM[:VIEW]:WINDow2|3|4|5|6|7:TRACe:Y[:SCALe]:SPACing LINear|LOGarithmic|PERCent|DB

Scale EVM Unit

Function

This command sets the unit for EVM of measurement results.

Command

```
:DISPlay:EVM[:VIEW]:WINDow2|3|4|5|6|7:TRACe:Y[:SCALe]:SPACing <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Scale mode |
| `LINear` | % scale |
| `LOGarithmic` | dB scale |
| `PERCent` | % scale (Default) |
| `DB` | dB scale |

Example of Use

To set the unit for EVM to dB scale.

```
DISP:EVM:WIND2:TRAC:Y:SPAC DB
```

## :DISPlay:EVM[:VIEW]:WINDow2|3|4|5|6|7:TRACe:Y[:SCALe]:SPACing?

Scale EVM Unit Query

### Function

This command queries the scale unit for EVM.

### Query

```
:DISPlay:EVM[:VIEW]:WINDow2|3|4|5|6|7:TRACe:Y[:SCALe]:SPACing?
```

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| <mode> | Scale mode |
| PERC | % scale |
| DB | dB scale |

### Example of Use

To query the unit for EVM.

```
DISP:EVM:WIND2:TRAC:Y:SPAC?
> DB
```

## 2.8.5 Scale – EVM

:DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel 2|5|10|20|-40|-20|0

EVM Scale

Function

Sets maximum value of graph vertical scale (y-axis) displaying EVM. The unit depends on the setting of EVM Unit.

Command

```
:DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Maximum range of vertical scale |

Maximum range of vertical axis scale when EVM Unit is set to %.

| | |
|---|---|
| 2 | 0 to 2% |
| 5 | 0 to 5% (Default) |
| 10 | 0 to 10% |
| 20 | 0 to 20% |

Maximum range of vertical axis scale when EVM Unit is set to dB.

| | |
|---|---|
| -40 | –80 to –40 dB (Default) |
| -20 | –80 to –20 dB |
| 0 | –80 to 0 dB |

Details

The selectable arguments depend on the setting of EVM Unit.

Example of Use

To set the vertical axis scale of the result graph to 10%.

```
DISP:EVM:WIND2:TRAC:Y:RLEV 10
```

## :DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel?

Scale EVM Scale Query

### Function

This command queries the vertical axis scale of the graph in which the vertical axis (Y) indicates EVM. The unit of the readout value depends on the setting of EVM Unit.

### Query

```
:DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel?
```

### Response

```
<mode>
```

### Parameter

Range of vertical axis scale when EVM Unit = %

| | |
|---|---|
| `2` | 0 to 2% |
| `5` | 0 to 5% |
| `10` | 0 to 10% |
| `20` | 0 to 20% |

Range of vertical axis scale when EVM Unit = dB

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

### Example of Use

To query the vertical axis scale of the result graph.

```
DISP:EVM:WIND2:TRAC:Y:RLEV?
> 10
```

### 2.8.6 Scale – Flatness

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 10|3|1|0.3|0.1|60|20|6|50|100

Flatness Scale

Function

This command sets the vertical axis scale of the Flatness graph. The unit depends on the setting of Flatness Type.

Command

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

Parameter

| `<mode>` | Vertical Axis Scale |
|---|---|

Range of vertical axis scale when Flatness Type = Amplitude

| | |
|---|---|
| 10 | –10 to +10 dB |
| 3 | –3 to +3 dB |
| 1 | –1 to +1 dB |

Range of vertical axis scale when Flatness Type = Difference Amplitude

| | |
|---|---|
| 1 | –1 to +1 dB |
| 0.3 | –0.3 to +0.3 dB |
| 0.1 | –0.1 to +0.1 dB |

Range of vertical axis scale when Flatness Type = Phase

| | |
|---|---|
| 60 | –60 to +60 degrees |
| 20 | –20 to +20 degrees |
| 6 | –6 to +6 degrees |

Range of vertical axis scale when Flatness Type = Group Delay

| | |
|---|---|
| 100 | –100 to 100 ns |
| 50 | –50 to 50 ns |
| 10 | –10 to 10 ns |
| 1 | –1 to 1 ns |

Details

The selectable arguments depend on the setting of Flatness Type. Note, however, that `10` can be set when Flatness Type is Amplitude or Group Delay, and `1` can be set when Flatness Type is Amplitude, Difference Amplitude or Group Delay as an argument.

Example of Use

To set the vertical axis scale of the result graph to 10 dB.

```
DISP:EVM:WIND4:TRAC:Y:RLEV 10
```

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

Scale EVM Scale Query

### Function

This command queries the vertical axis scale of the Flatness graph. The unit of the readout value depends on the setting of Flatness Type.

### Query

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

### Response

<mode>

### Parameter

| <mode> | Vertical Axis Scale |
|---|---|

Range of vertical axis scale when Flatness Type = Amplitude

| | |
|---|---|
| 10 | –10 to +10 dB |
| 3 | –3 to +3 dB |
| 1 | –1 to +1 dB |

Range of vertical axis scale when Flatness Type = Difference Amplitude

| | |
|---|---|
| 1 | –1 to +1 dB |
| 0.3 | –0.3 to +0.3 dB |
| 0.1 | –0.1 to +0.1 dB |

Range of vertical axis scale when Flatness Type = Phase

| | |
|---|---|
| 60 | –60 to +60 degrees |
| 20 | –20 to +20 degrees |
| 6 | –6 to +6 degrees |

Range of vertical axis scale when Flatness Type = Group Delay

| | |
|---|---|
| 100 | –100 to 100 ns |
| 50 | –50 to 50 ns |
| 10 | –10 to 10 ns |
| 1 | –1 to 1 ns |

### Example of Use

To query the vertical axis scale of the result graph.

```
DISP:EVM:WIND4:TRAC:Y:RLEV?
> 10
```

### 2.8.7 Trace Mode

:DISPlay:EVM[:VIEW]:SELect EVSubcarrier|EVSYmbol|FLATness|PVRB|EVRB|SUMMary

Trace Mode

Function

This command sets the trace mode.

Command

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

Parameter

| <mode> | Displayed result type |
|---|---|
| EVSubcarrier | Displays EVM vs Subcarrier (Default) |
| EVSYmbol | Displays EVM vs Symbol. |
| FLATness | Displays Spectral Flatness. |
| PVRB | Displays Power vs Resource Block. |
| EVRB | Displays EVM vs Resource Block. |
| SUMMary | Displays Summary. |
| TMSummary | Displays Test Model Summary. |

Details

EVM vs Resource Block can be selected only when Storage is set to OFF.

Power vs Resource Block can be selected only when Storage is set to OFF.

Example of Use

To display the Spectral Flatness to the graph window.

```
DISP:EVM:SEL FLAT
```

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

Trace Mode Query

### Function

This command queries the result type displayed on the graph window.

### Command

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

### Response

```
<mode>
```

### Parameter

| | |
|---|---|
| `<mode>` | Displayed result type |
| `EVS` | EVM vs Subcarrier is displayed. |
| `EVSY` | EVM vs Symbol is displayed. |
| `FLAT` | Spectral Flatness is displayed. |
| `PVRB` | Displays Power vs Resource Block. |
| `EVRB` | Displays EVM vs Resource Block. |
| `SUMM` | Displays Summary. |
| `TMS` | Displays Test Model Summary. |

### Example of Use

To query the result type displayed on the graph window.

```
DISP:EVM:SEL?
> FLAT
```

## 2.8.8 Flatness Type

### :CALCulate:EVM:WINDow4:TYPE AMPLitude|DAMPlitude|PHASe|GDELay

Spectral Flatness Type

Function

This command sets the display type for the spectral flatness graph.

Command

```
:CALCulate:EVM:WINDow4:TYPE <mode>
```

Parameter

| | |
|---|---|
| <mode> | Display type of spectral flatness graph |
| AMPLitude | Displays Amplitude (Default). |
| DAMPlitude | Displays Difference Amplitude. |
| PHASe | Displays Phase. |
| GDELay | Displays Group Delay. |

Example of Use

To set the display type of the spectral flatness graph to Amplitude.

```
CALC:EVM:WIND4:TYPE AMPL
```

### :CALCulate:EVM:WINDow4:TYPE?

Spectral Flatness Type Query

Function

This command queries the display type of the spectral flatness graph.

Query

```
:CALCulate:EVM:WINDow4:TYPE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Display type of spectral flatness graph |
| AMPL | Amplitude is displayed. |
| DAMP | Difference Amplitude is displayed. |
| PHAS | Phase is displayed. |
| GDEL | Group Delay is displayed. |

Example of Use

To query the display type of the spectral flatness graph.

```
CALC:EVM:WIND4:TYPE?
> AMPL
```

## 2.8.9 Graph View Setting

### :CALCulate:EVM:WINDow2:MODE EACH|AVERage

EVM vs Subcarrier View

Function

This command sets whether to display the averaged or unaveraged EVM vs Subcarrier.

Command

```
:CALCulate:EVM:WINDow2:MODE <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Averaging of EVM vs Subcarrier |
| `EACH` | Displays the unaveraged EVM vs Subcarrier. |
| `AVERage` | Displays the averaged EVM vs Subcarrier (Default). |

Example of Use

To display the averaged EVM vs Subcarrier.

```
CALC:EVM:WIND2:MODE AVER
```

### :CALCulate:EVM:WINDow2:MODE?

EVM vs Subcarrier View Query

Function

This command queries whether the EVM vs Subcarrier is averaged.

Query

```
:CALCulate:EVM:WINDow2:MODE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Averaging of EVM vs Subcarrier |
| `EACH` | Unaveraged EVM vs Subcarrier is displayed. |
| `AVER` | Averaged EVM vs Subcarrier is displayed. |

Example of Use

To query whether the EVM vs Subcarrier is averaged.

```
CALC:EVM:WIND2:MODE?
> AVER
```

## :CALCulate:EVM:WINDow2:GVIew RMS|RPEak

EVM vs Subcarrier View Graph View

**Function**

This command sets the display type for the EVM vs Subcarrier graph.

**Command**

```
:CALCulate:EVM:WINDow2:GVIew <mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Display type of EVM vs Subcarrier graph |
| `RMS` | Displays the average value. |
| `RPEak` | Displays the average and peak values (Default). |

**Example of Use**

To display the average value in the EVM vs Subcarrier graph.

```
CALC:EVM:WIND2:GVI RMS
```

## :CALCulate:EVM:WINDow2:GVIew?

EVM vs Subcarrier View Graph View Query

**Function**

This command queries the display type of the EVM vs Subcarrier graph.

**Query**

```
:CALCulate:EVM:WINDow2:GVIew?
```

**Response**

```
<mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Display type of EVM vs Subcarrier graph |
| `RMS` | The average value is displayed. |
| `RPE` | The average and peak values are displayed. |

**Example of Use**

To query the display type of the EVM vs Subcarrier graph.

```
CALC:EVM:WIND2:GVI?
> RMS
```

## :CALCulate:EVM:WINDow3:MODE EACH|AVERage

EVM vs Symbol View

Function

This command sets whether to display the averaged or unaveraged EVM vs Symbol.

Command

```
:CALCulate:EVM:WINDow3:MODE <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Averaging of EVM vs Symbol |
| `EACH` | Displays the unaveraged EVM vs Symbol. |
| `AVERage` | Displays the averaged EVM vs Symbol (Default). |

Example of Use

To display the averaged EVM vs Symbol.

```
CALC:EVM:WIND3:MODE AVER
```

## :CALCulate:EVM:WINDow3:MODE?

EVM vs Symbol View Query

Function

This command queries whether the displayed EVM vs Symbol is averaged.

Query

```
:CALCulate:EVM:WINDow3:MODE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Averaging of EVM vs Symbol |
| `EACH` | Unaveraged EVM vs Symbol is displayed. |
| `AVER` | Averaged EVM vs Symbol is displayed. |

Example of Use

To query whether the displayed EVM vs Symbol is averaged.

```
CALC:EVM:WIND3:MODE?
> EACH
```

## :CALCulate:EVM:WINDow3:GVIew RMS|RPEak

EVM vs Symbol View Graph View

Function

This command sets the display type for the EVM vs Symbol graph.

Command

```
:CALCulate:EVM:WINDow3:GVIew <mode>
```

Parameter

| | |
|---|---|
| <mode> | Display type of EVM vs Symbol graph |
| RMS | Displays the average value. |
| RPEak | Displays the average and peak values (Default). |

Example of Use

To display the average value of the EVM vs Symbol graph.

```
CALC:EVM:WIND3:GVI RMS
```

## :CALCulate:EVM:WINDow3:GVIew?

EVM vs Symbol View Graph View Query

Function

This command queries the display type of the EVM vs Symbol graph.

Query

```
:CALCulate:EVM:WINDow3:GVIew?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Display type of EVM vs Symbol graph |
| RMS | Average value is displayed. |
| RPE | Average and peak values are displayed. |

Example of Use

To query the display type of the EVM vs Symbol graph.

```
CALC:EVM:WIND3:GVI?
> RMS
```

## :CALCulate:EVM:WINDow5:MODE EACH|ALL

Power vs Resource Block View

Function

This command sets the display type of Power vs Resource Block.

Command

```
:CALCulate:EVM:WINDow5:MODE <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Display type |
| `EACH` | Displays Power vs Resource Block for each subframe. |
| `ALL` | Displays Power vs Resource Block for the entire analysis range (Default). |

Example of Use

Displays Power vs Resource Block for each subframe.

```
CALC:EVM:WIND5:MODE EACH
```

## :CALCulate:EVM:WINDow5:MODE?

Power vs Resource Block View Query

Function

This command queries the display type of Power vs Resource Block.

Query

```
:CALCulate:EVM:WINDow5:MODE?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Display type |
| `EACH` | Displays Power vs Resource Block for each subframe. |
| `ALL` | Displays Power vs Resource Block for the entire analysis range (Default). |

Example of Use

To query the display type of Power vs Resource Block.

```
CALC:EVM:WIND5:MODE?
> EACH
```

## :CALCulate:EVM:WINDow5:GVIew RMS|RPEak

Power vs Resource Block Graph View

**Function**

This command sets the display type of EVM displayed in Power vs Resource Block.

**Command**

`:CALCulate:EVM:WINDow5:GVIew <mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | EVM display type |
| `RMS` | Displays the average value. |
| `RPEak` | Displays the average and peak values (Default). |

**Example of Use**

To display the average value of EVM displayed in Power vs Resource Block.

```
CALC:EVM:WIND5:GVI RMS
```

## :CALCulate:EVM:WINDow5:GVIew?

Power vs Resource Block Graph View Query

**Function**

This command queries the graph display type of EVM displayed in Power vs Resource Block.

**Query**

`:CALCulate:EVM:WINDow5:GVIew?`

**Response**

`<mode>`

**Parameter**

| | |
|---|---|
| `<mode>` | EVM display type |
| `RMS` | Average value is displayed. |
| `RPE` | Average and peak values are displayed. |

**Example of Use**

To query the display type of EVM displayed in Power vs Resource Block.

```
CALC:EVM:WIND5:GVI?
> RMS
```

## :CALCulate:EVM:WINDow6:GVIew RMS|RPEak

EVM vs Resource Block Graph View

Function

This command sets the graph display type of EVM vs Resource Block.

Command

```
:CALCulate:EVM:WINDow6:GVIew <mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Graph display type |
| `RMS` | Displays the average value. |
| `RPEak` | Displays the average and peak values (Default). |

Example of Use

To display the average value of EVM vs Resource Block

```
CALC:EVM:WIND6:GVI RMS
```

## :CALCulate:EVM:WINDow6:GVIew?

EVM vs Resource Block Graph View Query

Function

This command queries the graph display type of EVM vs Resource Block.

Query

```
:CALCulate:EVM:WINDow6:GVIew?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| `<mode>` | Graph display type |
| `RMS` | Average value is displayed. |
| `RPE` | Average and peak values are displayed. |

Example of Use

To query the graph display type of EVM vs Resource Block.

```
CALC:EVM:WIND6:GVI?
> RMS
```

## 2.8.10 Constellation Display Range

### :DISPlay:EVM[:VIEW]:WINDow[1]:RANGe SYMBol|COMPosite

Constellation Display Range





**Function**

This command sets the range of symbols to be displayed in a constellation.

**Command**

```
:DISPlay:EVM[:VIEW]:WINDow[1]:RANGe <mode>
```

**Parameter**

| | |
|---|---|
| `<mode>` | Range of symbols to be displayed in a constellation |
| `SYMBol` | Symbol specified for Symbol Number (Default) |
| `COMPosite` | All symbols for frame selected at FrameOffset out of analysis target determined by Starting Subframe Number and Measurement Interval |

**Example of Use**

To display all symbols in a constellation.

```
DISP:EVM:WIND:RANG COMP
```

## :DISPlay:EVM[:VIEW]:WINDow[1]:RANGe?

Constellation Display Range Query

### Function

This command queries the range of symbols to be displayed in a constellation.

### Query

`:DISPlay:EVM[:VIEW]:WINDow[1]:RANGe?`

### Response

`<mode>`

### Parameter

| | |
|---|---|
| `<mode>` | Range of symbols to be displayed in a constellation |
| `SYMB` | Symbol specified for Symbol Number |
| `COMP` | All symbols for frame selected at FrameOffset out of analysis target determined by Starting Subframe Number and Measurement Interval |

### Example of Use

To query the range of symbols to be displayed in a constellation.

```
DISP:EVM:WIND:RANG?
> COMP
```

## 2.8.11 Constellation Symbol Number

### :CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer>

Constellation Symbol Number

Function

This command sets the symbol number of the displayed Constellation.

Command

```
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Example of Use

To set the symbol number of the displayed Constellation to 110.

```
CALC:EVM:WIND1:SYMB:NUMB 110
```

### :CALCulate:EVM:WINDow[1]:SYMBol:NUMBer?

Constellation Symbol Number Query

Function

This command queries the symbol number of the displayed Constellation.

Query

```
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |

Example of Use

To query the symbol number of the displayed Constellation.

```
CALC:EVM:WIND:SYMB:NUMB?
> 110
```

## 2.8.12 EVM vs Subcarrier Symbol Number

:CALCulate:EVM:WINDow2:SYMBol:NUMBer <integer>

EVM vs Subcarrier Symbol Number

Function

This command sets the symbol number of the displayed EVM vs Subcarrier.

Command

```
:CALCulate:EVM:WINDow2:SYMBol:NUMBer <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Details

This can be set when EVM vs Subcarrier View is Each Symbol.

Example of Use

To set the symbol number of the displayed EVM vs Subcarrier to 110.

```
CALC:EVM:WIND2:SYMB:NUMB 110
```

## :CALCulate:EVM:WINDow2:SYMBol:NUMBer?

EVM vs Subcarrier Symbol Number Query

Function

This command queries the symbol number of the displayed EVM vs Subcarrier.

Query

```
:CALCulate:EVM:WINDow2:SYMBol:NUMBer?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| <integer> | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |

Example of Use

To query the symbol number of the displayed EVM vs Subcarrier.

```
CALC:EVM:WIND2:SYMB:NUMB?
> 110
```

## 2.8.13 EVM vs Symbol Subcarrier Number

### :CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer>

EVM vs Symbol Subcarrier Number

Function

This command sets the subcarrier number of the displayed EVM vs Symbol.

Command

```
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Subcarrier number |
| Range | 0 to 1199 (Channel Bandwidth: 20 MHz)<br>0 to 899 (Channel Bandwidth: 15 MHz)<br>0 to 599 (Channel Bandwidth: 10 MHz)<br>0 to 299 (Channel Bandwidth: 5 MHz)<br>0 to 179 (Channel Bandwidth: 3 MHz)<br>0 to 71 (Channel Bandwidth: 1.4 MHz) |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Details

This can be set when EVM vs Symbol View is Each Subcarrier.

Example of Use

To set the subcarrier number of the displayed EVM vs Symbol to 110.

```
CALC:EVM:WIND3:SUBC:NUMB 110
```

## :CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?

EVM vs Symbol Subcarrier Number Query

### Function

This command queries the subcarrier number of displayed EVM vs Symbol.

### Query

```
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?
```

### Response

```
<integer>
```

### Parameter

| | | |
|---|---|---|
| `<integer>` | | Subcarrier number |
| | Range | 0 to 1199 (Channel Bandwidth: 20 MHz) |
| | | 0 to 899 (Channel Bandwidth: 15 MHz) |
| | | 0 to 599 (Channel Bandwidth: 10 MHz) |
| | | 0 to 299 (Channel Bandwidth: 5 MHz) |
| | | 0 to 179 (Channel Bandwidth: 3 MHz) |
| | | 0 to 71 (Channel Bandwidth: 1.4 MHz) |
| | Resolution | 1 |

### Example of Use

To query the subcarrier number of displayed EVM vs Symbol.

```
CALC:EVM:WIND3:SUBC:NUMB?
> 110
```

## 2.8.14 Subframe Number

### :CALCulate:EVM:WINDow5|6:SUBFrame:NUMBer <integer>

Subframe Number

**Function**

This command sets the subframe number to be displayed for Power vs Resource Block and EVM vs Resource Block.

**Command**

```
:CALCulate:EVM:WINDow5|6:SUBFrame:NUMBer <integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Subframe number to be displayed |
| Range | 0 to 9 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

**Example of Use**

To set the subframe number to be displayed for Power vs Resource Block to 1.

```
CALC:EVM:WIND5:SUBF:NUMB 1
```

### :CALCulate:EVM:WINDow5|6:SUBFrame:NUMBer?

Subframe Number Query

**Function**

This command queries the subframe number displayed for Power vs Resource Block and EVM vs Resource Block.

**Query**

```
:CALCulate:EVM:WINDow5|6:SUBFrame:NUMBer?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Subframe number to be displayed |
| Range | 0 to 9 |
| Resolution | 1 |

**Example of Use**

To query the subframe number displayed for Power vs Resource Block.

```
CALC:EVM:WIND5:SUBF:NUMB?
> 1
```

## 2.8.15 Resource Block Number

### :CALCulate:EVM:WINDow5|6:RBLock:NUMBer <integer>

Resource Block Number

**Function**

This command sets the Resource Block number to be displayed for Power vs Resource Block and EVM vs Resource Block.

**Command**

```
:CALCulate:EVM:WINDow5|6:RBLock:NUMBer <integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Resource Block number to be displayed |
| Range | 0 to 99 (Channel Bandwidth: 20 MHz) |
| | 0 to 74 (Channel Bandwidth: 15 MHz) |
| | 0 to 49 (Channel Bandwidth: 10 MHz) |
| | 0 to 24 (Channel Bandwidth: 5 MHz) |
| | 0 to 14 (Channel Bandwidth: 3 MHz) |
| | 0 to 5 (Channel Bandwidth: 1.4 MHz) |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

**Example of Use**

To set the Resource Block number to be displayed for Power vs Resource Block to 10.

```
CALC:EVM:WIND5:RBL:NUMB 10
```

## :CALCulate:EVM:WINDow5|6:RBLock:NUMBer?

Resource Block Number Query

### Function

This command queries the Resource Block number displayed for Power vs Resource Block.

### Query

```
:CALCulate:EVM:WINDow5|6:RBLock:NUMBer?
```

### Response

```
<integer>
```

### Parameter

| | |
|---|---|
| `<integer>` | Resource Block number to be displayed |
| Range | 0 to 99 (Channel Bandwidth: 20 MHz) |
| | 0 to 74 (Channel Bandwidth: 15 MHz) |
| | 0 to 49 (Channel Bandwidth: 10 MHz) |
| | 0 to 24 (Channel Bandwidth: 5 MHz) |
| | 0 to 14 (Channel Bandwidth: 3 MHz) |
| | 0 to 5 (Channel Bandwidth: 1.4 MHz) |
| Resolution | 1 |

### Example of Use

To query the Resource Block number displayed for Power vs Resource Block.

```
CALC:EVM:WIND5:RBL:NUMB?
> 10
```

## 2.8.16 Display Page

### :DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer>

Target Page Number

**Function**

This command sets the page number to be displayed for Summary.

**Command**

```
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer>
```

**Parameter**

| | |
|---|---|
| <integer> | Page number |
| Range | 1 to 16 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

**Example of Use**

To set the page number to be displayed for Summary to 1.

```
DISP:EVM:WIND7:PAGE:NUMB 1
```

### :DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer?

Target Page Number Query

**Function**

This command queries the page number displayed for Summary.

**Query**

```
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| <integer> | Page number |
| Range | 1 to 16 |
| Resolution | 1 |

**Example of Use**

To query the page number displayed for Summary.

```
DISP:EVM:WIND7:PAGE:NUMB?
> 1
```

## :DISPlay:EVM[:VIEW]:WINDow8:PAGE:NUMBer <integer>

Target Page Number

Function

This command sets the page number of Test Model Summary display.

Command

```
:DISPlay:EVM[:VIEW]:WINDow8:PAGE:NUMBer <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Page number |
| Range | 1 to 10 |
| Resolution | 1 |
| Suffix code | None |
| Default | 1 |

Example of Use

To set the page number of the displayed Summary to 1.

```
DISP:EVM:WIND8:PAGE:NUMB 1
```

## :DISPlay:EVM[:VIEW]:WINDow8:PAGE:NUMBer?

Target Page Number Query

Function

This command queries the page number of Test Model Summary display.

Query

```
:DISPlay:EVM[:VIEW]:WINDow8:PAGE:NUMBer?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Page number |
| Range | 1 to 10 |
| Resolution | 1 |

Example of Use

To query the page number of the displayed Summary.

```
DISP:EVM:WIND8:PAGE:NUMB?
> 1
```

## 2.8.17 Frame Offset

### :DISPlay:EVM[:VIEW]:WINDow[1]|2|3|4|5|6:TRACe:X:FRAMe:OFFSet <integer>

Frame Offset

Function

This command sets the frame position to be displayed on a graph.

Command

```
:DISPlay:EVM[:VIEW]:WINDow[1]|2|3|4|5|6:TRACe:X:FRAMe:OFFSet <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Frame Offset |
| Range | 0 to 4 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Example of Use

To set Frame Offset to 1.

```
DISP:EVM:WIND:TRAC:X:FRAM:OFFS 1
```

### :DISPlay:EVM[:VIEW]:WINDow[1]|2|3|4|5|6:TRACe:X:FRAMe:OFFSet?

Frame Offset Query

Function

This command queries the frame position to be displayed on a graph.

Query

```
:DISPlay:EVM[:VIEW]:WINDow[1]|2|3|4|5|6:TRACe:X:FRAMe:OFFSet?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Frame Offset |
| Range | 0 to 4 |
| Resolution | 1 |

Example of Use

To query the Frame Offset.

```
DISP:EVM:WIND:TRAC:X:FRAM:OFFS?
> 1
```

## 2.8.18 Marker – On/Off

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

Marker – On/Off

Function

This command sets the marker state On/Off.

Command

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

Parameter

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

Example of Use

To display the marker.

```
CALC:EVM:MARK 1
```

### :CALCulate:EVM:MARKer[:STATe]?

Marker – On/Off Query

Function

This command queries the marker On/Off state.

Query

```
:CALCulate:EVM:MARKer[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | Marker On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the marker On/Off state.

```
CALC:EVM:MARK?
> 1
```

## 2.8.19 Active Trace

### :CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom

Active Trace

Function

This command sets the target graph of the marker.

Command

```
:CALCulate:EVM:MARKer:ACTive <mode>
```

Parameter

| | |
|---|---|
| <mode> | Target graph |
| CONStellation | Constellation |
| BOTTom | Graph window (Default) |

Example of Use

To set the target graph of the marker to the Constellation.

```
CALC:EVM:MARK:ACT CONS
```

### :CALCulate:EVM:MARKer:ACTive?

Active Trace Query

Function

This command queries the target graph of the marker.

Query

```
:CALCulate:EVM:MARKer:ACTive?
```

Response

```
<mode>
```

Parameter

| | |
|---|---|
| <mode> | Target graph |
| CONS | Constellation |
| BOTT | Graph window |

Example of Use

To query the target graph of the marker.

```
CALC:EVM:MARK:ACT?
> CONS
```

## 2.8.20 Marker Position Number

:CALCulate:EVM:MARKer:SUBCarrier <integer>

Marker Subcarrier Number

Function

This command sets the position of the marker on the Constellation or on the graph window, in subcarrier number. The target graph is set by Active Trace.

Command

```
:CALCulate:EVM:MARKer:SUBCarrier <integer>
```

Parameter

`<integer>` Subcarrier number

Range for Constellation, EVM vs Subcarrier, Amplitude, and Phase:

0 to 1199 (Channel Bandwidth: 20 MHz)
0 to 899 (Channel Bandwidth: 15 MHz)
0 to 599 (Channel Bandwidth: 10 MHz)
0 to 299 (Channel Bandwidth: 5 MHz)
0 to 179 (Channel Bandwidth: 3 MHz)
0 to 71 (Channel Bandwidth: 1.4 MHz)

Range for Difference Amplitude and Group Delay:

1 to 1198 (Channel Bandwidth: 20 MHz)
1 to 898 (Channel Bandwidth: 15 MHz)
1 to 598 (Channel Bandwidth: 10 MHz)
1 to 298 (Channel Bandwidth: 5 MHz)
1 to 178 (Channel Bandwidth: 3 MHz)
1 to 70 (Channel Bandwidth: 1.4 MHz)

| | |
|---|---|
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Details

Valid only for EVM vs Subcarrier and Spectral Flatness.
However, this command can be set only when Active Trace is Constellation for EVM vs Symbol.

Example of Use

To set the position of the marker on the Constellation to 100.

```
CALC:EVM:MARK:SUBC 100
```

## :CALCulate:EVM:MARKer:SUBCarrier?

Marker Subcarrier Number Query

### Function

This command queries the position of the marker on the Constellation or on the graph window, in subcarrier number. The target graph is set by Active Trace.

### Command

```
:CALCulate:EVM:MARKer:SUBCarrier?
```

### Response

```
<integer>
```

### Parameter

`<integer>` Subcarrier number

Range for Constellation, EVM vs Subcarrier, Amplitude, and Phase:

0 to 1199 (Channel Bandwidth: 20 MHz)
0 to 899 (Channel Bandwidth: 15 MHz)
0 to 599 (Channel Bandwidth: 10 MHz)
0 to 299 (Channel Bandwidth: 5 MHz)
0 to 179 (Channel Bandwidth: 3 MHz)
0 to 71 (Channel Bandwidth: 1.4 MHz)

Range for Difference Amplitude and Group Delay

1 to 1198 (Channel Bandwidth: 20 MHz)
1 to 898 (Channel Bandwidth: 15 MHz)
1 to 598 (Channel Bandwidth: 10 MHz)
1 to 298 (Channel Bandwidth: 5 MHz)
1 to 178 (Channel Bandwidth: 3 MHz)
1 to 70 (Channel Bandwidth: 1.4 MHz)

Resolution 1

### Details

This command is not available when Trace Mode is set to Summary.

When Trace Mode is either Power vs Resource Block or EVM vs Resource Block, always queries number of subcarrier for market at PDSCH constellation.

When Trace Mode is EVM vs Symbol and Active Trace is Bottom Graph Select, queries number of subcarrier for marker selected at Bottom Graph of EVM vs Subcarrier and Spectral Flatness.

Example of Use

To query the position of the marker on the Constellation in subcarrier number.

```
CALC:EVM:MARK:SUBC?
> 100
```

## :CALCulate:EVM:MARKer:SYMBol <integer>

Marker Symbol Number

Function

This command sets the position of the marker on the EVM vs Symbol graph in symbol number.

Command

```
:CALCulate:EVM:MARKer:SYMBol <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Example of Use

To set the position of the marker on the EVM vs Symbol graph to 100.

```
CALC:EVM:MARK:SYMB 100
```

## :CALCulate:EVM:MARKer:SYMBol?

Marker Symbol Number Query

**Function**

This command queries the position of the marker on the Constellation or on the EVM vs Symbol graph in symbol number.

**Command**

```
:CALCulate:EVM:MARKer:SYMBol?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Symbol number |
| Range | 0 to 139 |
| Resolution | 1 |

**Details**

For Power vs Resource Block and EVM vs Resource Block, the marker position of Constellation is returned in a symbol number.
Invalid when Trace Mode is set to Summary.

**Example of Use**

To query the position of the marker on the EVM vs Symbol graph in symbol number.

```
CALC:EVM:MARK:SYMB?
> 100
```

## :CALCulate:EVM:MARKer:RELement <integer>

Marker Resource Element Number

Function

This command sets the marker position of PDSCH Constellation in a source element number when Trace Mode is set to Power vs Resource Block or EVM vs Resource Block.

Command

```
:CALCulate:EVM:MARKer:RELement <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Resource element number |
| Range | 0 to (Count of resource elements included in selected resource block – 1). |
| Resolution | 1 |
| Suffix code | None |
| Default value | 0 |

Example of Use

To set the marker target of Constellation to 100.

```
CALC:EVM:MARK:REL 100
```

## :CALCulate:EVM:MARKer:RELement?

Marker Resource Element Number Query

Function

This command queries the marker position of PDSCH Constellation in a resource element number when Trace Mode is set to Power vs Resource Block or EVM vs Resource Block.

Command

```
:CALCulate:EVM:MARKer:RELement?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Resource element number |
| Range | 0 to (Count of resource elements included in selected resource block – 1). |
| Resolution | 1 |

Example of Use

To query the marker target of Constellation.

```
CALC:EVM:MARK:SYMB?
> 100
```

## 2.8.21 Marker Value

### :CALCulate:EVM:MARKer:X?

Marker X Axis Value Query

**Function**

This command queries the X-coordinate value at the marker on the PDSCH Constellation.

**Query**

```
:CALCulate:EVM:MARKer:X?
```

**Response**

```
<real>
```

**Parameter**

| | |
|---|---|
| <real> | X-coordinate value at the marker on the PPSCH Constellation |

**Details**

This command is available when Trace Mode is set to Summary.

**Example of Use**

To query the X-coordinate value at the marker on the Constellation.

```
CALC:EVM:MARK:X?
> 0.12345
```

## :CALCulate:EVM:MARKer:Y[:RMS]?

Marker Y Axis Value (RMS) Query

**Function**

This command queries the RMS value on the Y coordinate at the marker on the target graph.

**Query**

`:CALCulate:EVM:MARKer:Y[:RMS]?`

**Response**

`<real>`

**Parameter**

`<real>` RMS value on Y coordinate at maker on target graph

When Active Trace = Constellation:

Constellation: No unit

When Active Trace = Graph window
and Trace Mode = EVM vs Subcarrier:

When EVM Unit = %: In % units
When EVM Unit = dB: In dB units

When Active Trace = Graph window
and Trace Mode = EVM vs Symbol:

When EVM Unit = %: In % units
When EVM Unit = dB: In dB units

When Active Trace = Graph window
and Trace Mode = Spectral Flatness:

For Amplitude: In dB units
For Difference Amplitude: In dB units
For Phase: In degree units
For Group Delay: In ns units

When Active Trace = Graph window
and Trace Mode = Power vs Resource Block:

Power In dB units

When Active Trace = Graph window
and Trace Mode = EVM vs Resource Block:

When EVM Unit = % In % units
When EVM Unit = dB In dB units

Details

This command is available when Trace Mode is set to Summary.
When Trace Mode is either Power vs Resource Block or EVM vs Resource Block, queries reading of Constellation Q axis or value of marker at bottom of screen using following command.
`:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom`

Example of Use

To query the RMS value on the Y coordinate at the marker on the target graph.

```
CALC:EVM:MARK:Y?
> -20.00
```

## :CALCulate:EVM:MARKer:Y:PEAK?

Marker Y Axis Value (Peak) Query

Function

This command queries the peak value on the Y coordinate at the marker on the graph window.

Query

```
:CALCulate:EVM:MARKer:Y:PEAK?
```

Response

`<real>`

Parameter

| | | |
|---|---|---|
| `<real>` | Peak value on Y coordinate at maker on target graph | |
| | When EVM Unit = %: | % units |
| | When EVM Unit = dB: | dB units |

Details

Disabled when Trace Mode is Summary.

Uses following command to read value when Trace Mode is Power vs RB.

```
:CALCulate:EVM:MARKer:POWer[:RELative]?
:CALCulate:EVM:MARKer:POWer:ABSolute?
```

Disabled when Trace Mode is Summary.

Example of Use

To query the peak value on the Y coordinate at the marker on the target graph.

```
CALC:EVM:MARK:Y:PEAK?
> -20.00
```

## :CALCulate:EVM:MARKer:EVM[:RMS]?

Marker EVM Value (RMS) Query

### Function

This command queries the RMS value of EVM at the marker position in the corresponding graph.

### Query

```
:CALCulate:EVM:MARKer:EVM[:RMS]?
```

### Response

```
<real>
```

### Parameter

| | |
|---|---|
| `<real>` | RMS value at marker on target graph. |
| When EVM Unit is set to %: | Unit: % |
| When EVM Unit is set to dB: | Unit: dB |

### Details

–999.0 is returned when no measurement is made or an error occurs.

### Example of Use

To query the RMS value of EVM at the marker position.

```
CALC:EVM:MARK:EVM?
> -20.00
```

## :CALCulate:EVM:MARKer:EVM:PEAK?

Marker EVM Value (Peak) Query

**Function**

This command queries the Peak value of EVM at the marker position in the graph window.

**Query**

```
:CALCulate:EVM:MARKer:EVM:PEAK?
```

**Response**

<real>

**Parameter**

| | |
|---|---|
| <real> | Peak value of EVM at the marker position in the corresponding graph |

| | |
|---|---|
| When EVM Unit is set to %: | Unit: % |
| When EVM Unit is set to dB: | Unit: dB |

**Details**

–999.0 is returned when Trace Mode is set to Summary.

**Example of Use**

To query the Peak value of EVM at the marker position.

```
CALC:EVM:MARK:EVM:PEAK?
> -20.00
```

## :CALCulate:EVM:MARKer:POWer[:RELative]?

Marker Relative Power Value (RMS) Query

### Function

This command queries the relative power value at the marker position in the corresponding graph.

### Query

```
:CALCulate:EVM:MARKer:POWer[:RELative]?
```

### Response

```
<real>
```

### Parameter

| | |
|---|---|
| `<real>` | Relative power value at the marker position in the corresponding graph |

When Trace Mode is set to EVM vs Resource Block or Power vs Resource Block:

| | |
|---|---|
| Unit | dB |

### Details

Returns –999.0 when Trace Mode is neither Power vs Resource Block nor EVM vs Resource Block.

### Example of Use

To query the relative power value at the marker position.

```
CALC:EVM:MARK:POW?
> -20.000
```

## :CALCulate:EVM:MARKer:POWer:ABSolute?

Marker Absolute Power Value (Peak) Query

**Function**

This command queries the absolute power value at the marker position in the graph window.

**Query**

```
:CALCulate:EVM:MARKer:POWer:ABSolute?
```

**Response**

```
<real>
```

**Parameter**

| | |
|---|---|
| `<real>` | Absolute power value at the marker position in the corresponding graph |
| Unit | dBm |

**Details**

–999.0 is returned when Trace Mode is not set to Power vs Resource Block or EVM vs Resource Block.

**Example of Use**

To query the absolute power value at the marker position.

```
CALC:EVM:MARK:POW:ABS?
> -20.00
```

## :CALCulate:EVM:MARKer:CHANnel?

Marker Channel Query

### Function

This command queries the type of physical channel selected by the marker in the graph window.

### Query

```
:CALCulate:EVM:MARKer:CHANnel?
```

### Response

<channel_type>

### Parameter

| <channel_type> | Physical channel type |
|---|---|
| PSS | P-SS |
| SSS | S-SS |
| PBCH | PBCH |
| PDCC | PDCCH |
| PHIC | PHICH |
| PCF | PCFICH |
| PDSC | PDSCH |
| RSA0 | RS(ANT0) |
| RSA1 | RS(ANT1) |
| RSA2 | RS(ANT2) |
| RSA3 | RS(ANT3) |
| DTX | DTX |
| PDSD | PDSCH DTX |

### Details

–999.0 is returned when no measurement is made or an error occurs.

### Example of Use

To query the type of physical channel selected by the marker.

```
CALC:EVM:MARK:CHAN?
> PDSC
```

### 2.8.22 Peak Search

:CALCulate:MARKer:MAXimum

Peak Search

Function

This command searches for the maximum level point of the active trace and moves the marker point.

Command

```
:CALCulate:MARKer:MAXimum
```

Details

This function is available on the following traces:

- EVM vs Subcarrier
- EVM vs Symbol
- Spectral flatness
- Power vs Resource Block
- EVM vs Resource Block

When reading out a marker value after executing this command, use the `*WAI` command and execute synchronization control.

Note that synchronization control during the Continuous mode is not supported.

Example of Use

To move the marker to the maximum level point and query the marker value.

```
CALC:MARK:MAX
*WAI
CALC:EVM:MARK:Y?
```

## :CALCulate:MARKer:MAXimum:NEXT

Next Peak Search

### Function

This command searches for the feature point on the active trace and moves the marker point to the peak point of a level that is lower than the current marker level.

### Command

```
:CALCulate:MARKer:MAXimum:NEXT
```

### Details

This function is available on the following traces:

- EVM vs Subcarrier
- EVM vs Symbol
- Spectral flatness
- Power vs Resource Block
- EVM vs Resource Block

When reading out a marker value after executing this command, use the `*WAI` command and execute synchronization control.

Note that synchronization control during the Continuous mode is not supported.

### Example of Use

To move the marker to the next peak point and query the marker value.

```
CALC:MARK:MAX:NEXT
*WAI
CALC:EVM:MARK:Y?
```

## :CALCulate:MARKer:MINimum

Dip Search

### Function

This command searches for the minimum level point of the active trace and moves the marker point.

### Command

```
:CALCulate:MARKer:MINimum
```

### Details

This function is available when the following traces are active:

- EVM vs Subcarrier
- EVM vs Symbol
- Spectral flatness
- Power vs Resource Block
- EVM vs Resource Block

When reading out a marker value after executing this command, use the *WAI command and execute synchronization control.

Note that synchronization control during the Continuous mode is not supported.

### Example of Use

To move the marker to the minimum level point and query the marker value.

```
CALC:MARK:MIN
*WAI
CALC:EVM:MARK:Y?
```

## :CALCulate:MARKer:MINimum:NEXT

Next Dip Search

### Function

This command searches for the feature point on the active trace and moves the marker point to the peak point in which the marker value of a level that is lower than the current marker level is minimum.

### Command

```
:CALCulate:MARKer:MINimum:NEXT
```

### Details

This function is available when the following traces are active:

- EVM vs Subcarrier
- EVM vs Symbol
- Spectral flatness
- Power vs Resource Block
- EVM vs Resource Block

When reading out a marker value after executing this command, use the *WAI command and execute synchronization control.

Note that synchronization control during the Continuous mode is not supported.

### Example of Use

To move the marker to the next minimum peak point and query the marker value.

```
CALC:MARK:MIN:NEXT
*WAI
CALC:EVM:MARK:Y?
```

# 2.9 Batch Measurement Function

This section describes the device messages related to Batch measurement.

Table 2.9-1 lists the device messages used for execution and result query of Batch measurement.



**Table 2.9-1 Device Messages for Batch Measurement Functions**

| Function | Device Message |
|---|---|
| Configure | :CONFigure:BATCh |
| Initiate | :INITiate:BATCh |
| Fetch | :FETCh:BATCh[n]? |
| Read/Measure | :READ:BATCh[n]? |
| | :MEASure:BATCh[n]? |

Table 2.9-2 lists the responses to parameter `[n]` of the device messages in Table 2.9-1.

**Table 2.9-2 Responses to Batch Measurement Results**

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Band #0 Measurement status<br>2. Band #0 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>3. Band #0 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>4. Band #0 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>5. Band #0 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>6. Band #0 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>7. Band #0 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>8. Band #0 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>9. Band #0 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>10. Band #0 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>11. Band #0 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>12. Band #0 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>13. Band #0 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>14. Band #0 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm)<br>15. –999.99<br>16. –999.99<br>17. –999.99<br>18. –999.99<br>19. –999.99<br>20. –999.99<br>21. –999.99<br>22. –999.99<br>23. –999.99<br>24. –999.99<br>25. –999.99<br>26. –999.99<br>27. –999.99<br>28. –999.99<br>29. –999.99<br>30. –999.99 |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 31. Band #1 Measurement status<br>32. Band #1 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>33. Band #1 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>34. Band #1 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>35. Band #1 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>36. Band #1 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>37. Band #1 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>38. Band #1 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>39. Band #1 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>40. Band #1 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>41. Band #1 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>42. Band #1 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>43. Band #1 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>44. Band #1 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm)<br>45. –999.99<br>46. –999.99<br>47. –999.99<br>48. –999.99<br>49. –999.99<br>50. –999.99<br>51. –999.99<br>52. –999.99<br>53. –999.99<br>54. –999.99<br>55. –999.99<br>56. –999.99<br>57. –999.99<br>58. –999.99<br>59. –999.99<br>60. –999.99 |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 61. Band #2 Measurement status<br>62. Band #2 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>63. Band #2 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>64. Band #2 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>65. Band #2 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>66. Band #2 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>67. Band #2 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>68. Band #2 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>69. Band #2 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>70. Band #2 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>71. Band #2 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>72. Band #2 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>73. Band #2 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>74. Band #2 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm)<br>75. –999.99<br>76. –999.99<br>77. –999.99<br>78. –999.99<br>79. –999.99<br>80. –999.99<br>81. –999.99<br>82. –999.99<br>83. –999.99<br>84. –999.99<br>85. –999.99<br>86. –999.99<br>87. –999.99<br>88. –999.99<br>89. –999.99<br>90. –999.99 |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 91. CC #0 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>92. CC #0 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>93. CC #0 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>94. CC #0 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>95. CC #0 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>96. CC #0 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>97. CC #0 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>98. CC #0 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>99. CC #0 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>100. CC #0 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>101. CC #0 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>102. CC #0 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>103. CC #0 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm)<br>104. CC #1 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>105. CC #1 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>106. CC #1 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>107. CC #1 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>108. CC #1 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>109. CC #1 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>110. CC #1 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>111. CC #1 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>112. CC #1 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>113. CC #1 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>114. CC #1 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>115. CC #1 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>116. CC #1 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm)<br>117. CC #2 Frequency Error (Average) [Hz] (resolution 0.01 Hz)<br>118. CC #2 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz)<br>119. CC #2 PDSCH EVM (Average) [%] (resolution 0.01 %)<br>120. CC #2 PDSCH EVM (Maximum) [%] (resolution 0.01 %)<br>121. CC #2 Band Power (Average) [dBm] (resolution 0.01 dBm)<br>122. CC #2 Band Power (Maximum) [dBm] (resolution 0.01 dBm)<br>123. CC #2 Band Power (Minimum) [dBm] (resolution 0.01 dBm)<br>124. CC #2 RS Power (Average) [dBm] (resolution 0.01 dBm)<br>125. CC #2 RS Power (Maximum) [dBm] (resolution 0.01 dBm)<br>126. CC #2 RS Power (Minimum) [dBm] (resolution 0.01 dBm)<br>127. CC #2 OSTP Power (Average) [dBm] (resolution 0.01 dBm)<br>128. CC #2 OSTP Power (Maximum) [dBm] (resolution 0.01 dBm)<br>129. CC #2 OSTP Power (Minimum) [dBm] (resolution 0.01 dBm) |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 130. CC #3 Frequency Error(Average) [Hz] (resolution 0.01 Hz)<br>131. CC #3 Frequency Error(Maximum) [Hz] (resolution 0.01 Hz)<br>132. CC #3 PDSCH EVM(Average) [%] (resolution 0.01 %)<br>133. CC #3 PDSCH EVM(Maximum) [%] (resolution 0.01 %)<br>134. CC #3 Band Power(Average) [dBm] (resolution 0.01 dBm)<br>135. CC #3 Band Power(Maximum) [dBm] (resolution 0.01 dBm)<br>136. CC #3 Band Power(Minimum) [dBm] (resolution 0.01 dBm)<br>137. CC #3 RS Power(Average) [dBm] (resolution 0.01 dBm)<br>138. CC #3 RS Power(Maximum) [dBm] (resolution 0.01 dBm)<br>139. CC #3 RS Power(Minimum) [dBm] (resolution 0.01 dBm)<br>140. CC #3 OSTP Power(Average) [dBm] (resolution 0.01 dBm)<br>141. CC #3 OSTP Power(Maximum) [dBm] (resolution 0.01 dBm)<br>142. CC #3 OSTP Power(Minimum) [dBm] (resolution 0.01 dBm)<br>143. CC #4 Frequency Error(Average) [Hz] (resolution 0.01 Hz)<br>144. CC #4 Frequency Error(Maximum) [Hz] (resolution 0.01 Hz)<br>145. CC #4 PDSCH EVM(Average) [%] (resolution 0.01 %)<br>146. CC #4 PDSCH EVM(Maximum) [%] (resolution 0.01 %)<br>147. CC #4 Band Power(Average) [dBm] (resolution 0.01 dBm)<br>148. CC #4 Band Power(Maximum) [dBm] (resolution 0.01 dBm)<br>149. CC #4 Band Power(Minimum) [dBm] (resolution 0.01 dBm)<br>150. CC #4 RS Power(Average) [dBm] (resolution 0.01 dBm)<br>151. CC #4 RS Power(Maximum) [dBm] (resolution 0.01 dBm)<br>152. CC #4 RS Power(Minimum) [dBm] (resolution 0.01 dBm)<br>153. CC #4 OSTP Power(Average) [dBm] (resolution 0.01 dBm)<br>154. CC #4 OSTP Power(Maximum) [dBm] (resolution 0.01 dBm)<br>155. CC #4 OSTP Power(Minimum) [dBm] (resolution 0.01 dBm)<br>156. CC #0 Time Offset(Average) [s] (resolution 0.1 ns)<br>157. CC #0 Time Offset(Maximum) [s] (resolution 0.1 ns)<br>158. CC #1 Time Offset(Average) [s] (resolution 0.1 ns)<br>159. CC #1 Time Offset(Maximum) [s] (resolution 0.1 ns)<br>160. CC #2 Time Offset(Average) [s] (resolution 0.1 ns)<br>161. CC #2 Time Offset(Maximum) [s] (resolution 0.1 ns)<br>162. CC #3 Time Offset(Average) [s] (resolution 0.1 ns)<br>163. CC #3 Time Offset(Maximum) [s] (resolution 0.1 ns)<br>164. CC #4 Time Offset(Average) [s] (resolution 0.1 ns)<br>165. CC #4 Time Offset(Maximum) [s] (resolution 0.1 ns)<br>166. CC #0 Total EVM (Average) [%] (resolution 0.01%)<br>167. CC #0 Total EVM (Maximum) [%] (resolution 0.01%)<br>168. CC #1 Total EVM (Average) [%] (resolution 0.01%)<br>169. CC #1 Total EVM (Maximum) [%] (resolution 0.01%)<br>170. CC #2 Total EVM (Average) [%] (resolution 0.01%))<br>171. CC #2 Total EVM (Maximum) [%] (resolution 0.01%)<br>172. CC #3 Total EVM (Average) [%] (resolution 0.01%) |

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SCPI Device Message Details

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 173. CC #3 Total EVM (Maximum) [%] (resolution 0.01%)<br>174. CC #4 Total EVM (Average) [%] (resolution 0.01%)<br>175. CC #4 Total EVM (Maximum) [%] (resolution 0.01%)<br>176. CC #0 PDSCH QPSK EVM (Average) [%] (resolution 0.01%)<br>177. CC #0 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%)<br>178. CC #1 PDSCH QPSK EVM (Average) [%] (resolution 0.01%)<br>179. CC #1 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%)<br>180. CC #2 PDSCH QPSK EVM (Average) [%] (resolution 0.01%)<br>181. CC #2 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%)<br>182. CC #3 PDSCH QPSK EVM (Average) [%] (resolution 0.01%)<br>183. CC #3 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%)<br>184. CC #4 PDSCH QPSK EVM (Average) [%] (resolution 0.01%)<br>185. CC #4 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%)<br>186. CC #0 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%)<br>187. CC #0 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%)<br>188. CC #1 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%)<br>189. CC #1 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%)<br>190. CC #2 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%)<br>191. CC #2 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%)<br>192. CC #3 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%)<br>193. CC #3 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%)<br>194. CC #4 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%)<br>195. CC #4 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%)<br>196. CC #0 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%)<br>197. CC #0 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%)<br>198. CC #1 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%)<br>199. CC #1 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%)<br>200. CC #2 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%)<br>201. CC #2 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%)<br>202. CC #3 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%)<br>203. CC #3 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%)<br>204. CC #4 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%)<br>205. CC #4 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%)<br>206. CC #0 Origin Offset (Average) [dB] (resolution 0.1 dB)<br>207. CC #0 Origin Offset (Maximum) [dB] (resolution 0.1 dB)<br>208. CC #1 Origin Offset (Average) [dB] (resolution 0.1 dB)<br>209. CC #1 Origin Offset (Maximum) [dB] (resolution 0.1 dB)<br>210. CC #2 Origin Offset (Average) [dB] (resolution 0.1 dB)<br>211. CC #2 Origin Offset (Maximum) [dB] (resolution 0.1 dB)<br>212. CC #3 Origin Offset (Average) [dB] (resolution 0.1 dB)<br>213. CC #3 Origin Offset (Maximum) [dB] (resolution 0.1 dB)<br>214. CC #4 Origin Offset (Average) [dB] (resolution 0.1 dB)<br>215. CC #4 Origin Offset (Maximum) [dB] (resolution 0.1 dB) |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 216. CC #0 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%)<br>217. CC #0 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%)<br>218. CC #1 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%)<br>219. CC #1 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%)<br>220. CC #2 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%)<br>221. CC #2 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%)<br>222. CC #3 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%)<br>223. CC #3 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%)<br>224. CC #4 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%)<br>225. CC #4 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%) |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 2 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Band #0 Measurement Status<br>2. Band #0 OBW [MHz] (resolution 0.0001 MHz)<br>3. Band #0 ACLR E-UTRA L2 [dB] (resolution 0.01 dB)<br>4. Band #0 ACLR E-UTRA L1 [dB] (resolution 0.01 dB)<br>5. Band #0 ACLR E-UTRA U1 [dB] (resolution 0.01 dB)<br>6. Band #0 ACLR E-UTRA U2 [dB] (resolution 0.01 dB)<br>7. Band #0 ACLR UTRA L2 [dB] (resolution 0.01 dB)<br>8. Band #0 ACLR UTRA L1 [dB] (resolution 0.01 dB)<br>9. Band #0 ACLR UTRA U1 [dB] (resolution 0.01 dB)<br>10. Band #0 ACLR UTRA U2 [dB] (resolution 0.01 dB)<br>11. Band #0 OBUE Margin [dB] (resolution 0.01 dB)<br>12. Band #0 OBUE Peak Absolute Level [dBm] (resolution 0.01 dBm)<br>13. Band #0 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz)<br>14. Band #1 Measurement Status<br>15. Band #1 OBW [MHz] (resolution 0.0001 MHz)<br>16. Band #1 ACLR E-UTRA L2 [dB] (resolution 0.01 dB)<br>17. Band #1 ACLR E-UTRA L1 [dB] (resolution 0.01 dB)<br>18. Band #1 ACLR E-UTRA U1 [dB] (resolution 0.01 dB)<br>19. Band #1 ACLR E-UTRA U2 [dB] (resolution 0.01 dB)<br>20. Band #1 ACLR UTRA L2 [dB] (resolution 0.01 dB)<br>21. Band #1 ACLR UTRA L1 [dB] (resolution 0.01 dB)<br>22. Band #1 ACLR UTRA U1 [dB] (resolution 0.01 dB)<br>23. Band #1 ACLR UTRA U2 [dB] (resolution 0.01 dB)<br>24. Band #1 OBUE Margin [dB] (resolution 0.01 dB)<br>25. Band #1 OBUE Peak Absolute Level [dBm] (resolution 0.01 dBm)<br>26. Band #1 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz)<br>27. Band #2 Measurement Status<br>28. Band #2 OBW [MHz] (resolution 0.0001 MHz)<br>29. Band #2 ACLR E-UTRA L2 [dB] (resolution 0.01 dB)<br>30. Band #2 ACLR E-UTRA L1 [dB] (resolution 0.01 dB)<br>31. Band #2 ACLR E-UTRA U1 [dB] (resolution 0.01 dB)<br>32. Band #2 ACLR E-UTRA U2 [dB] (resolution 0.01 dB)<br>33. Band #2 ACLR UTRA L2 [dB] (resolution 0.01 dB)<br>34. Band #2 ACLR UTRA L1 [dB] (resolution 0.01 dB)<br>35. Band #2 ACLR UTRA U1 [dB] (resolution 0.01 dB)<br>36. Band #2 ACLR UTRA U2 [dB] (resolution 0.01 dB)<br>37. Band #2 OBUE Margin [dB] (resolution 0.01 dB)<br>38. Band #2 OBUE Peak Absolute Level [dBm] (resolution 0.01 dBm)<br>39. Band #2 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz)<br>40. CC #0 OBW [MHz] (resolution 0.0001 MHz)<br>41. CC #1 OBW [MHz] (resolution 0.0001 MHz)<br>42. CC #2 OBW [MHz] (resolution 0.0001 MHz)<br>43. CC #3 OBW [MHz] (resolution 0.0001 MHz)<br>44. CC #4 OBW [MHz] (resolution 0.0001 MHz) |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 3 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Band #0 OBW/ACLR Spectrum trace point number<br>2. Band #1 OBW/ACLR Spectrum trace point number<br>3. Band #2 OBW/ACLR Spectrum trace point number |
| 4 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Band #0 Lower OBUE Spectrum(Normal) trace point number<br>2. Band #0 Upper OBUE Spectrum(Normal) trace point number<br>3. Band #1 Lower OBUE Spectrum(Normal) trace point number<br>4. Band #1 Upper OBUE Spectrum(Normal) trace point number<br>5. Band #2 Lower OBUE Spectrum(Normal) trace point number<br>6. Band #2 Upper OBUE Spectrum(Normal) trace point number |
| 5 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Band #0 Lower OBUE Spectrum(Additional) trace point number<br>2. Band #0 Upper OBUE Spectrum(Additional) trace point number<br>3. Band #1 Lower OBUE Spectrum(Additional) trace point number<br>4. Band #1 Upper OBUE Spectrum(Additional) trace point number<br>5. Band #2 Lower OBUE Spectrum(Additional) trace point number<br>6. Band #2 Upper OBUE Spectrum(Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 11 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum absolute level<br>1. Band #0 1st OBW/ACLR Spectrum absolute level<br>2. Band #0 2nd OBW/ACLR Spectrum absolute level<br>…<br>n. Band #0 nth OBW/ACLR Spectrum absolute level<br>***Note:***<br>n is the Band #0 OBW/ACLR Spectrum trace point number |
| 12 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum frequency<br>1. Band #0 1st OBW/ACLR Spectrum frequency<br>2. Band #0 2nd OBW/ACLR Spectrum frequency<br>…<br>n. Band #0 nth OBW/ACLR Spectrum frequency<br>***Note:***<br>n is the Band #0 OBW/ACLR Spectrum trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 13 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal Margin<br>1. Band #0 1st Lower OBUE Spectrum Normal Margin<br>2. Band #0 2nd Lower OBUE Spectrum Normal Margin<br>…<br>n. Band #0 nth Lower OBUE Spectrum Normal Margin<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 14 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal Margin<br>1. Band #0 1st Upper OBUE Spectrum Normal Margin<br>2. Band #0 2nd Upper OBUE Spectrum Normal Margin<br>…<br>n. Band #0 nth Upper OBUE Spectrum Normal Margin<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Normal) trace point number |
| 15 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional Margin<br>1. Band #0 1st Lower OBUE Spectrum Additional Margin<br>2. Band #0 2nd Lower OBUE Spectrum Additional Margin<br>…<br>n. Band #0 nth Lower OBUE Spectrum Additional Margin<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Additional) trace point number |
| 16 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional Margin<br>1. Band #0 1st Upper OBUE Spectrum Additional Margin<br>2. Band #0 2nd Upper OBUE Spectrum Additional Margin<br>…<br>n. Band #0 nth Upper OBUE Spectrum Additional Margin<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 17 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal absolute level<br>1. Band #0 1st Lower OBUE Spectrum Normal absolute level<br>2. Band #0 2nd Lower OBUE Spectrum Normal absolute level<br>...<br>n. Band #0 nth Lower OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 18 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal absolute level<br>1. Band #0 1st Upper OBUE Spectrum Normal absolute level<br>2. Band #0 2nd Upper OBUE Spectrum Normal absolute level<br>...<br>n. Band #0 nth Upper OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Normal) trace point number |
| 19 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #0 1st Lower OBUE Spectrum Additional absolute level<br>2. Band #0 2nd Lower OBUE Spectrum Additional absolute level<br>...<br>n. Band #0 nth Lower OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Additional) trace point number |
| 20 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #0 1st Upper OBUE Spectrum Additional absolute level<br>2. Band #0 2nd Upper OBUE Spectrum Additional absolute level<br>...<br>n. Band #0 nth Upper OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Additional) trace point number |

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Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 21 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal standard value<br>1. Band #0 1st Lower OBUE Spectrum Normal standard value<br>2. Band #0 2nd Lower OBUE Spectrum Normal standard value<br>…<br>n. Band #0 nth Lower OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 22 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal standard value<br>1. Band #0 1st Upper OBUE Spectrum Normal standard value<br>2. Band #0 2nd Upper OBUE Spectrum Normal standard value<br>…<br>n. Band #0 nth Upper OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Normal) trace point number |
| 23 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional standard value<br>1. Band #0 1st Lower OBUE Spectrum Additional standard value<br>2. Band #0 2nd Lower OBUE Spectrum Additional standard value<br>…<br>n. Band #0 nth Lower OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Additional) trace point number |
| 24 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional standard value<br>1. Band #0 1st Upper OBUE Spectrum Additional standard value<br>2. Band #0 2nd Upper OBUE Spectrum Additional standard value<br>…<br>n. Band #0 nth Upper OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 25 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal frequency<br>1. Band #0 1st Lower OBUE Spectrum Normal frequency<br>2. Band #0 2nd Lower OBUE Spectrum Normal frequency<br>...<br>n. Band #0 nth Lower OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 26 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal frequency<br>1. Band #0 1st Upper OBUE Spectrum Normal frequency<br>2. Band #0 2nd Upper OBUE Spectrum Normal frequency<br>...<br>n. Band #0 nth Upper OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Normal) trace point number |
| 27 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional frequency<br>1. Band #0 1st Lower OBUE Spectrum Additional frequency<br>2. Band #0 2nd Lower OBUE Spectrum Additional frequency<br>...<br>n. Band #0 nth Lower OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Additional) trace point number |
| 28 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional frequency<br>1. Band #0 1st Upper OBUE Spectrum Additional frequency<br>2. Band #0 2nd Upper OBUE Spectrum Additional frequency<br>...<br>n. Band #0 nth Upper OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 29 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal RBW<br>1. Band #0 1st Lower OBUE Spectrum Normal RBW<br>2. Band #0 2nd Lower OBUE Spectrum Normal RBW<br>…<br>n. Band #0 nth Lower OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 30 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal RBW<br>1. Band #0 1st Upper OBUE Spectrum Normal RBW<br>2. Band #0 2nd Upper OBUE Spectrum Normal RBW<br>…<br>n. Band #0 nth Upper OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Normal) trace point number |
| 31 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional RBW<br>1. Band #0 1st Lower OBUE Spectrum Additional RBW<br>2. Band #0 2nd Lower OBUE Spectrum Additional RBW<br>…<br>n. Band #0 nth Lower OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Additional) trace point number |
| 32 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional RBW<br>1. Band #0 1st Upper OBUE Spectrum Additional RBW<br>2. Band #0 2nd Upper OBUE Spectrum Additional RBW<br>…<br>n. Band #0 nth Upper OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #0 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 41 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum absolute level<br>1. Band #1 1st OBW/ACLR Spectrum absolute level<br>2. Band #1 2nd OBW/ACLR Spectrum absolute level<br>…<br>n. Band #1 nth OBW/ACLR Spectrum absolute level<br>***Note:***<br>n is the Band #1 OBW/ACLR Spectrum trace point number |
| 42 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum frequency<br>1. Band #1 1st OBW/ACLR Spectrum frequency<br>2. Band #1 2nd OBW/ACLR Spectrum frequency<br>…<br>n. Band #1 nth OBW/ACLR Spectrum frequency<br>***Note:***<br>n is the Band #1 OBW/ACLR Spectrum trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 43 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal Margin<br>1. Band #1 1st Lower OBUE Spectrum Normal Margin<br>2. Band #1 2nd Lower OBUE Spectrum Normal Margin<br>…<br>n. Band #1 nth Lower OBUE Spectrum Normal Margin<br>**Note:**<br>n is the Band #1 Lower OBUE Spectrum (Normal) trace point number |
| 44 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal Margin<br>1. Band #1 1st Upper OBUE Spectrum Normal Margin<br>2. Band #1 2nd Upper OBUE Spectrum Normal Margin<br>…<br>n. Band #1 nth Upper OBUE Spectrum Normal Margin<br>**Note:**<br>n is the Band #1 Upper OBUE Spectrum (Normal) trace point number |
| 45 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional Margin<br>1. Band #1 1st Lower OBUE Spectrum Additional Margin<br>2. Band #1 2nd Lower OBUE Spectrum Additional Margin<br>…<br>n. Band #1 nth Lower OBUE Spectrum Additional Margin<br>**Note:**<br>n is the Band #1 Lower OBUE Spectrum (Additional) trace point number |
| 46 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional Margin<br>1. Band #1 1st Upper OBUE Spectrum Additional Margin<br>2. Band #1 2nd Upper OBUE Spectrum Additional Margin<br>…<br>n. Band #1 nth Upper OBUE Spectrum Additional Margin<br>**Note:**<br>n is the Band #1 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 47 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal absolute level<br>1. Band #1 1st Lower OBUE Spectrum Normal absolute level<br>2. Band #1 2nd Lower OBUE Spectrum Normal absolute level<br>…<br>n. Band #1 nth Lower OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Normal) trace point number |
| 48 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal absolute level<br>1. Band #1 1st Upper OBUE Spectrum Normal absolute level<br>2. Band #1 2nd Upper OBUE Spectrum Normal absolute level<br>…<br>n. Band #1 nth Upper OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Normal) trace point number |
| 49 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #1 1st Lower OBUE Spectrum Additional absolute level<br>2. Band #1 2nd Lower OBUE Spectrum Additional absolute level<br>…<br>n. Band #1 nth Lower OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Additional) trace point number |
| 50 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #1 1st Upper OBUE Spectrum Additional absolute level<br>2. Band #1 2nd Upper OBUE Spectrum Additional absolute level<br>…<br>n. Band #1 nth Upper OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 51 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal standard value<br>1. Band #1 1st Lower OBUE Spectrum Normal standard value<br>2. Band #1 2nd Lower OBUE Spectrum Normal standard value<br>…<br>n. Band #1 nth Lower OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Normal) trace point number |
| 52 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal standard value<br>1. Band #1 1st Upper OBUE Spectrum Normal standard value<br>2. Band #1 2nd Upper OBUE Spectrum Normal standard value<br>…<br>n. Band #1 nth Upper OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Normal) trace point number |
| 53 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional standard value<br>1. Band #1 1st Lower OBUE Spectrum Additional standard value<br>2. Band #1 2nd Lower OBUE Spectrum Additional standard value<br>…<br>n. Band #1 nth Lower OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Additional) trace point number |
| 54 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional standard value<br>1. Band #1 1st Upper OBUE Spectrum Additional standard value<br>2. Band #1 2nd Upper OBUE Spectrum Additional standard value<br>…<br>n. Band #1 nth Upper OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 55 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal frequency<br>1. Band #1 1st Lower OBUE Spectrum Normal frequency<br>2. Band #1 2nd Lower OBUE Spectrum Normal frequency<br>...<br>n. Band #1 nth Lower OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #0 Lower OBUE Spectrum (Normal) trace point number |
| 56 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal frequency<br>1. Band #1 1st Upper OBUE Spectrum Normal frequency<br>2. Band #1 2nd Upper OBUE Spectrum Normal frequency<br>...<br>n. Band #1 nth Upper OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Normal) trace point number |
| 57 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional frequency<br>1. Band #1 1st Lower OBUE Spectrum Additional frequency<br>2. Band #1 2nd Lower OBUE Spectrum Additional frequency<br>...<br>n. Band #1 nth Lower OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Additional) trace point number |
| 58 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional frequency<br>1. Band #1 1st Upper OBUE Spectrum Additional frequency<br>2. Band #1 2nd Upper OBUE Spectrum Additional frequency<br>...<br>n. Band #1 nth Upper OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 59 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal RBW<br>1. Band #1 1st Lower OBUE Spectrum Normal RBW<br>2. Band #1 2nd Lower OBUE Spectrum Normal RBW<br>…<br>n. Band #1 nth Lower OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Normal) trace point number |
| 60 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal RBW<br>1. Band #1 1st Upper OBUE Spectrum Normal RBW<br>2. Band #1 2nd Upper OBUE Spectrum Normal RBW<br>…<br>n. Band #1 nth Upper OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Normal) trace point number |
| 61 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional RBW<br>1. Band #1 1st Lower OBUE Spectrum Additional RBW<br>2. Band #1 2nd Lower OBUE Spectrum Additional RBW<br>…<br>n. Band #1 nth Lower OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #1 Lower OBUE Spectrum (Additional) trace point number |
| 62 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional RBW<br>1. Band #1 1st Upper OBUE Spectrum Additional RBW<br>2. Band #1 2nd Upper OBUE Spectrum Additional RBW<br>…<br>n. Band #1 nth Upper OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #1 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 71 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum absolute level<br>1. Band #2 1st OBW/ACLR Spectrum absolute level<br>2. Band #2 2nd OBW/ACLR Spectrum absolute level<br>…<br>n. Band #2 nth OBW/ACLR Spectrum absolute level<br>***Note:***<br>n is the Band #2 OBW/ACLR Spectrum trace point number |
| 72 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n OBW/ACLR Spectrum frequency<br>1. Band #2 1st OBW/ACLR Spectrum frequency<br>2. Band #2 2nd OBW/ACLR Spectrum frequency<br>…<br>n. Band #2 nth OBW/ACLR Spectrum frequency<br>***Note:***<br>n is the Band #2 OBW/ACLR Spectrum trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 73 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal Margin<br>1. Band #2 1st Lower OBUE Spectrum Normal Margin<br>2. Band #2 2nd Lower OBUE Spectrum Normal Margin<br>…<br>n. Band #2 nth Lower OBUE Spectrum Normal Margin<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Normal) trace point number |
| 74 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal Margin<br>1. Band #2 1st Upper OBUE Spectrum Normal Margin<br>2. Band #2 2nd Upper OBUE Spectrum Normal Margin<br>…<br>n. Band #2 nth Upper OBUE Spectrum Normal Margin<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Normal) trace point number |
| 75 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional Margin<br>1. Band #2 1st Lower OBUE Spectrum Additional Margin<br>2. Band #2 2nd Lower OBUE Spectrum Additional Margin<br>…<br>n. Band #2 nth Lower OBUE Spectrum Additional Margin<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Additional) trace point number |
| 76 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional Margin<br>1. Band #2 1st Upper OBUE Spectrum Additional Margin<br>2. Band #2 2nd Upper OBUE Spectrum Additional Margin<br>…<br>n. Band #2 nth Upper OBUE Spectrum Additional Margin<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 77 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal absolute level<br>1. Band #2 1st Lower OBUE Spectrum Normal absolute level<br>2. Band #2 2nd Lower OBUE Spectrum Normal absolute level<br>…<br>n. Band #2 nth Lower OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Normal) trace point number |
| 78 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal absolute level<br>1. Band #2 1st Upper OBUE Spectrum Normal absolute level<br>2. Band #2 2nd Upper OBUE Spectrum Normal absolute level<br>…<br>n. Band #2 nth Upper OBUE Spectrum Normal absolute level<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Normal) trace point number |
| 79 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #2 1st Lower OBUE Spectrum Additional absolute level<br>2. Band #2 2nd Lower OBUE Spectrum Additional absolute level<br>…<br>n. Band #2 nth Lower OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Additional) trace point number |
| 80 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional absolute level<br>1. Band #2 1st Upper OBUE Spectrum Additional absolute level<br>2. Band #2 2nd Upper OBUE Spectrum Additional absolute level<br>…<br>n. Band #2 nth Upper OBUE Spectrum Additional absolute level<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 81 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal standard value<br>1. Band #2 1st Lower OBUE Spectrum Normal standard value<br>2. Band #2 2nd Lower OBUE Spectrum Normal standard value<br>…<br>n. Band #2 nth Lower OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Normal) trace point number |
| 82 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal standard value<br>1. Band #2 1st Upper OBUE Spectrum Normal standard value<br>2. Band #2 2nd Upper OBUE Spectrum Normal standard value<br>…<br>n. Band #2 nth Upper OBUE Spectrum Normal standard value<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Normal) trace point number |
| 83 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional standard value<br>1. Band #2 1st Lower OBUE Spectrum Additional standard value<br>2. Band #2 2nd Lower OBUE Spectrum Additional standard value<br>…<br>n. Band #2 nth Lower OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Additional) trace point number |
| 84 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional standard value<br>1. Band #2 1st Upper OBUE Spectrum Additional standard value<br>2. Band #2 2nd Upper OBUE Spectrum Additional standard value<br>…<br>n. Band #2 nth Upper OBUE Spectrum Additional standard value<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Additional) trace point number |

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

| n | Result Mode | Response |
|---|---|---|
| 85 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal frequency<br>1. Band #2 1st Lower OBUE Spectrum Normal frequency<br>2. Band #2 2nd Lower OBUE Spectrum Normal frequency<br>…<br>n. Band #2 nth Lower OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Normal) trace point number |
| 86 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal frequency<br>1. Band #2 1st Upper OBUE Spectrum Normal frequency<br>2. Band #2 2nd Upper OBUE Spectrum Normal frequency<br>…<br>n. Band #2 nth Upper OBUE Spectrum Normal frequency<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Normal) trace point number |
| 87 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional frequency<br>1. Band #2 1st Lower OBUE Spectrum Additional frequency<br>2. Band #2 2nd Lower OBUE Spectrum Additional frequency<br>…<br>n. Band #2 nth Lower OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Additional) trace point number |
| 88 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional frequency<br>1. Band #2 1st Upper OBUE Spectrum Additional frequency<br>2. Band #2 2nd Upper OBUE Spectrum Additional frequency<br>…<br>n. Band #2 nth Upper OBUE Spectrum Additional frequency<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Additional) trace point number |

**Table 2.9-2 Responses to Batch Measurement Results (Cont'd)**

| n | Result Mode | Response |
|---|---|---|
| 89 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Normal RBW<br>1. Band #2 1st Lower OBUE Spectrum Normal RBW<br>2. Band #2 2nd Lower OBUE Spectrum Normal RBW<br>…<br>n. Band #2 nth Lower OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Normal) trace point number |
| 90 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Normal RBW<br>1. Band #2 1st Upper OBUE Spectrum Normal RBW<br>2. Band #2 2nd Upper OBUE Spectrum Normal RBW<br>…<br>n. Band #2 nth Upper OBUE Spectrum Normal RBW<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Normal) trace point number |
| 91 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Lower OBUE Spectrum Additional RBW<br>1. Band #2 1st Lower OBUE Spectrum Additional RBW<br>2. Band #2 2nd Lower OBUE Spectrum Additional RBW<br>…<br>n. Band #2 nth Lower OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #2 Lower OBUE Spectrum (Additional) trace point number |
| 92 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to n Upper OBUE Spectrum Additional RBW<br>1. Band #2 1st Upper OBUE Spectrum Additional RBW<br>2. Band #2 2nd Upper OBUE Spectrum Additional RBW<br>…<br>n. Band #2 nth Upper OBUE Spectrum Additional RBW<br>***Note:***<br>n is the Band #2 Upper OBUE Spectrum (Additional) trace point number |

For details on Result Mode, refer to the description of the `:SYSTem:RESult:MODE` command in the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Operation Manual (Mainframe Remote Control).*

Table 2.9-3 lists device messages for setting parameters for Batch measurement.

**Table 2.9-3 Device Messages for Setting Parameters for Batch Measurement**

| Parameter | Device message |
|---|---|
| Batch Storage Mode | [:SENSe]:BATCh:AVERage[:STATe] OFF\|ON\|AMAXimum\|0\|1\|2 |
| | [:SENSe]:BATCh:AVERage[:STATe]? |
| Batch Storage Count | [:SENSe]:BATCh:AVERage:COUNt <integer> |
| | [:SENSe]:BATCh:AVERage:COUNt? |
| Storage Mode for Unwanted Emissions | [:SENSe]:BATCh:AVERage:UWEMissions[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:BATCh:AVERage:UWEMissions[:STATe]? |
| Storage Count for Unwanted Emissions | [:SENSe]:BATCh:AVERage:UWEMissions:COUNt <integer> |
| | [:SENSe]:BATCh:AVERage:UWEMissions:COUNt? |

### 2.9.1 Batch Measure

## :CONFigure:BATCh

Batch

Function

This command selects the Batch measurement function.

Command

`:CONFigure:BATCh`

Details

This command only selects the measurement function and does not start measurement.

Example of Use

To select the Batch measurement function.

`CONF:BATC`

## :INITiate:BATCh

Batch

Function

This command starts Batch measurement.

Command

`:INITiate:BATCh`

Example of Use

To start Batch measurement.

`INIT:BATC`

## :FETCh:BATCh[n]?

Batch Query

Function

This command queries the result of Batch measurement.

Query

```
:FETCh:BATCh[n]?
```

Response

See Table 2.9-2.

Details

`–999.0` is returned when measurement is not performed or an error has occurred. Note, however, that “`999999999999`” is returned in the case of Frequency Error.

Example of Use

To query the result of Batch measurement.

```
FETC:BATC?
> 0,1.23,4.56,1.002.00,...
```

## :READ:BATCh[n]?

Batch Query

### Function

This command performs Batch measurement once (single measurement) with the current settings, and then queries the measured result.

### Query

```
:READ:BATCh[n]?
```

### Response

See Table 2.9-2.

### Example of Use

To perform Batch measurement and queries the measured result.

```
READ:BATC?
```

### Related Command

This command functions the same as the following command.

```
:MEASure:BATCh[n]?
```

## :MEASure:BATCh[n]?

Batch Query

### Function

This command performs Batch measurement once (single measurement) with the current settings, and then queries the measured result.

### Query

```
:MEASure:BATCh[n]?
```

### Response

See Table 2.9-2.

### Example of Use

To perform Batch measurement and query the measurement result.

```
MEAS:BATC?
```

### Related Command

This command functions the same as the following command.

```
READ:BATCh[n]?
```

### 2.9.2 Batch Storage Mode

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

Batch Storage Mode

Function

This command sets the Batch storage mode.

Command

```
[:SENSe]:BATCh:AVERage[:STATe] <mode>
```

Parameter

| | |
|---|---|
| <mode> | Batch Storage Mode |
| OFF\|0 | Off (Default) |
| ON\|1 | Average |
| AMAXimum\|2 | Average & Max |

Example of Use

To set the Batch storage mode to Average.

```
BATC:AVER ON
```

#### [:SENSe]:BATCh:AVERage[:STATe]?

Batch Storage Mode Query

Function

This command queries the Batch storage mode.

Query

```
[:SENSe]:BATCh:AVERage[:STATe]?
```

Response

<mode>

Parameter

| | |
|---|---|
| <mode> | Batch Storage Mode |
| 0 | Off |
| 1 | Average |
| 2 | Average & Max |

Example of Use

To query the Batch storage mode.

```
BATC:AVER?
> 1
```

### 2.9.3 Batch Storage Count

## [:SENSe]:BATCh:AVERage:COUNt <integer>

Batch Storage Count

Function

This command sets the Batch storage count.

Command

```
[:SENSe]:BATCh:AVERage:COUNt <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Batch Storage Count |
| Range | 2 to 9999 |
| Resolution | 1 |
| Default | 10 |

Example of Use

To set the Batch storage count to 10.

```
BATC:AVER:COUN 10
```

## [:SENSe]:BATCh:AVERage:COUNt?

Batch Storage Count Query

Function

This command queries the Batch storage count.

Query

```
[:SENSe]:BATCh:AVERage:COUNt?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Batch Storage Count |
| Range | 2 to 9999 |
| Resolution | 1 |

Example of Use

To query the Batch storage count.

```
BATC:AVER:COUN?
> 10
```

### 2.9.4 Batch Storage Mode for Unwanted Emissions

#### [:SENSe]:BATCh:AVERage:UWEMissions[:STATe] OFF|ON|0|1

Batch Storage Mode for Unwanted Emissions

Function

This command sets the Batch storage mode for Unwanted Emissions.

Command

```
[:SENSe]:BATCh:AVERage:UWEMissions[:STATe] <switch>
```

Parameter

| | |
|---|---|
| <switch> | Batch Storage Mode for Unwanted Emissions |
| OFF\|0 | Off (Default) |
| ON\|1 | Average |

Example of Use

To set the Batch storage mode for Unwanted Emissions to Average.

```
BATC:AVER:UWEM ON
```

#### [:SENSe]:BATCh:AVERage:UWEMissions[:STATe]?

Batch Storage Mode for Unwanted Emissions Query

Function

This command queries the Batch storage mode for Unwanted Emissions.

Query

```
[:SENSe]:BATCh:AVERage:UWEMissions[:STATe]?
```

Response

```
<switch>
```

Parameter

| | |
|---|---|
| <switch> | Batch Storage Mode for Unwanted Emissions |
| 0 | Off |
| 1 | Average |

Example of Use

To query the Batch storage mode for Unwanted Emissions.

```
BATC:AVER:UWEM?
> 1
```

## 2.9.5 Batch Storage Count for Unwanted Emissions

### [:SENSe]:BATCh:AVERage:UWEMissions:COUNt <integer>

Batch Storage Count for Unwanted Emissions

Function

This command sets the Batch storage count for Unwanted Emissions.

Command

```
[:SENSe]:BATCh:AVERage:UWEMissions:COUNt <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Batch Storage Count for Unwanted Emissions |
| Range | 2 to 9999 |
| Resolution | 1 |
| Default | 10 |

Example of Use

To set the Batch storage count for Unwanted Emissions to 10.

```
BATC:AVER:UWEM:COUN 10
```

### [:SENSe]:EVM:AVERage:UWEMissions:COUNt?

Batch Storage Count for Unwanted Emissions Query

Function

This command queries the Batch storage count for Unwanted Emissions.

Query

```
[:SENSe]:BATCh:AVERage:UWEMissions:COUNt?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Batch Storage Count for Unwanted Emissions |
| Range | 2 to 9999 |
| Resolution | 1 |

Example of Use

To query the Batch storage count for Unwanted Emissions.

```
BATC:AVER:UWEM:COUN?
> 10
```

# 2.10 Power vs Time Measurement Function

This section describes the device messages related to the Power vs Time measurement.

***Note:***

This function cannot be used with the replay function at the same time.

Table 2.10-1 lists the device messages used for execution and result query of the Power vs Time measurement.

**Table 2.10-1 Power vs Time Measurement Function**

| Function | Device Message |
|---|---|
| Configure | `:CONFigure:PVTime` |
| Initiate | `:INITiate:PVTime` |
| Fetch | `:FETCh:PVTime[n]?` |
| Read/Measure | `:READ:PVTime[n]?` |
| | `:MEASure:PVTime[n]?` |

Table 2.10-2 lists the responses to parameter [n] of the device messages in Table 2.10-1.

**Table 2.10-2 Responses to Power vs Time Measurement Results**

| n | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. Mask judgement – total<br>2. Mask judgement – gap1<br>3. Mask judgement – gap2<br>4. Off power dBm<br>5. –999.0<br>6. Off Power dBm/MHz<br>7. Off Power dBm/MHz- Pass/Fail judgement<br>8. On Power dBm<br>9. –999.0<br>10. Transient Period – Gap1 Ramp down (count by seconds)<br>11. Transient Period – Gap1 Ramp down - Pass/Fail judgement<br>12. Transient Period – Gap1 Ramp up (count by seconds)<br>13. Transient Period – Gap1 Ramp up - Pass/Fail judgement<br>14. Transient Period – Gap2 Ramp down (count by seconds)<br>15. Transient Period – Gap2 Ramp down - Pass/Fail judgement<br>16. Transient Period – Gap2 Ramp up (count by seconds)<br>17. Transient Period – Gap2 Ramp up - Pass/Fail judgement<br>18. Power at Mask Edge – Gap1 Ramp down dBm<br>19. Power at Mask Edge – Gap1 Ramp down - Pass/Fail judgement<br>20. Power at Mask Edge – Gap1 Ramp up dBm<br>21. Power at Mask Edge – Gap1 Ramp up - Pass/Fail judgement<br>22. Power at Mask Edge – Gap2 Ramp down dBm<br>23. Power at Mask Edge – Gap2 Ramp down - Pass/Fail judgement<br>24. Power at Mask Edge – Gap2 Ramp up dBm<br>25. Power at Mask Edge – Gap2 Ramp up - Pass/Fail judgement<br>26. to 40. –999.0 |

Table 2.10-3 lists device messages for setting parameters for the Power vs Time measurement.

**Table 2.10-3 Device Messages for Setting Parameters for Power vs Time Measurement**

| Function | Device Message |
|---|---|
| Wide Dynamic Range | [:SENSe]:PVTime:WDRange OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:WDRange? |
| Noise Correction | [:SENSe]:PVTime:NCORrection OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:NCORrection? |
| Pre-Amp Mode | [:SENSe]:PVTime:PAMode OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:PAMode? |
| Select Mask | [:SENSe]:PVTime:MASK:SELect STANdard\|USER |
| | [:SENSe]:PVTime:MASK:SELect? |
| Mask Setup – Time Reference | [:SENSe]:PVTime:MASK:TIME:REFerence ABSolute\|RELative |
| | [:SENSe]:PVTime:MASK:TIME:REFerence? |
| Mask Setup – Start Time | [:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute<time_1>,<time_2> |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute? |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative <time_1>,<time_2> |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative? |
| Mask Setup – Stop Time | [:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute <time_1>,<time_2> |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute? |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative <time_1>,<time_2> |
| | [:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative? |
| Mask Setup – Off Power limit | [:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute <level> |
| | [:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute? |
| Load Standard Setting | [:SENSe]:PVTime:MASK:LSSetting |
| Smoothing Mode | [:SENSe]:PVTime:SMOothing[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:SMOothing[:STATe]? |
| Smoothing Length | [:SENSe]:PVTime:SMOothing:LENGth <integer> |
| | [:SENSe]:PVTime:SMOothing:LENGth? |
| Smoothing Range | [:SENSe]:PVTime:SMOothing:RANGe MASK\|ENTire |
| | [:SENSe]:PVTime:SMOothing:RANGe? |
| Storage Mode | [:SENSe]:PVTime:AVERage[:STATe] OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:AVERage[:STATe]? |

**Table 2.10-3 Device Messages for Setting Parameters for Power vs Time Measurement (Cont'd)**

| Function | Device Message |
|---|---|
| Storage Count | [:SENSe]:PVTime:AVERage:COUNt <integer> |
| | [:SENSe]:PVTime:AVERage:COUNt? |
| Marker – ON/OFF | :CALCulate:PVTime:MARKer[:STATe] OFF\|ON\|0\|1 |
| | :CALCulate:PVTime:MARKer[:STATe]? |
| Top Graph Marker Number | :CALCulate:PVTime:WINDow[1]:MARKer:SYMBol <real> |
| | :CALCulate:PVTime:WINDow[1]:MARKer:SYMBol? |
| Top Graph Marker to Transient | :CALCulate:PVTime:WINDow[1]:MARKer:TRANsient |
| Top Graph Marker to Fail | :CALCulate:PVTime:WINDow[1]:MARKer:FAIL |
| Bottom Graph Marker Number | :CALCulate:PVTime:WINDow2:MARKer:TS <integer> |
| | :CALCulate:PVTime:WINDow2:MARKer:TS? |
| | :CALCulate:PVTime:WINDow2:MARKer:TIME? |
| Bottom Graph Marker Value | :CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute[1]? |
| | :CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute2? |
| | :CALCulate:PVTime:WINDow2:MARKer:JUDGe? |
| Frame Sync | [:SENSe]:PVTime:FSYNc OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:FSYNc? |
| Peak Search (Margin) | :CALCulate:PVTime:WINDow2:MARKer:MAXimum |
| | :CALCulate:PVTime:WINDow2:MARKer:MAXimum:NEXT |
| Frame Sync | [:SENSe]:PVTime:FSYNc OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:FSYNc? |
| Limiter Mode | [:SENSe]:PVTime:LMODe OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:LMODe? |
| Limiter Mode ATT | [:SENSe]:PVTime:LMODe:ATTenuation <rel_ampl> |
| | [:SENSe]:PVTime:LMODe:ATTenuation? |
| Limiter Mode Offset | [:SENSe]:PVTime:LMODe:OFFSet:STATe OFF\|ON\|0\|1 |
| | [:SENSe]:PVTime:LMODe:OFFSet:STATe? |
| Limiter Mode Offset Value | [:SENSe]:PVTime:LMODe:OFFSet <rel_power> |
| | [:SENSe]:PVTime:LMODe:OFFSet? |
| Noise Correction Mode | [:SENSe]:PVTime:LMODe:NCORrection:MODE AUTO\|MANual |
| | [:SENSe]:PVTime:LMODe:NCORrection:MODE? |
| Noise Calculate | [:SENSe]:PVTime:LMODe:NCORrection:CALCulate |
| Power vs Time Limiter Mode Continue | :INITiate:PVTime:LMODe:CONTinue |
| | :INITiate:PVTime:LMODe:STATe? |

## 2.10.1 Measure

### :CONFigure:PVTime

Modulation

Function

This command selects the Power vs Time function.

Command

```
:CONFigure:PVTime
```

Details

The measurement is not performed.

Example of Use

To select the Power vs Time function:

```
CONF:PVT
```

### :INITiate:PVTime

Modulation

Function

This command performs the Power vs Time measurement.

Command

```
:INITiate:PVTime
```

Example of Use

To perform the Power vs Time measurement:

```
INIT:PVT
```

## :FETCh:PVTime[n]?

Modulation Query

### Function

This command queries the Power vs Time Measurement results.

### Query

`:FETCh:PVTime[n]?`

### Response

Refer to Table 2.10-2.

### Details

-999.0 is returned when no measurement is made or an error occurs.

### Example of Use

To query the Power vs Time measurement results:

`FETC:PVT?`

## :READ:PVTime [n]?

Modulation Query

### Function

This command performs the Power vs Time measurement once (single measurement) using the current settings, and then queries the measurement results.

### Query

```
:READ:PVTime[n]?
```

### Response

Refer to Table 2.10-2.

### Example of Use

To perform the Power vs time measurement and query the measurement results:

```
READ:PVT?
```

### Related Command

This command has the same function as the following command.

```
:MEASure:PVTime[n]?
```

## :MEASure:PVTime[n]?

Modulation Query

### Function

This command performs the Power vs Time measurement once (single measurement) using the current settings, and then queries the measurement results.

### Query

`:MEASure:PVTime[n]?`

### Response

Refer to Table 2.10-2.

### Example of Use

To perform the Power vs time measurement and query the measurement results:

`MEAS:PVT?`

### Related Command

This command has the same function as the following command.

`READ:PVTime[n]?`

## 2.10.2 Wide Dynamic Range

### [:SENSe]:PVTime:WDRange OFF|ON|0|1

Wide Dynamic Range

**Function**

This command sets the Wide Dynamic Range On/Off.
When Wide Dynamic Range is set to On, changing the measurement parameter internally at the Off Power measurement can improve the measurement accuracy.

**Command**

```
[:SENSe]:PVTime:WDRange <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | Wide Dynamic Range On/Off |
| `ON|1` | On |
| `OFF|0` | Off |

**Details**

When changing to a measurement function other than the Power vs Time, Wide Dynamic Range is changed to Off automatically.

**Example of Use**

To set Wide Dynamic Range to On:

```
PVT:WDR ON
```

## [:SENSe]:PVTime:WDRange?

Wide Dynamic Range Query

### Function

This command queries the Wide Dynamic Range settings.

### Query

```
[:SENSe]:PVTime:WDRange?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| `<switch>` | Wide Dynamic Range On/Off |
| `1` | On |
| `0` | Off |

### Example of Use

To query the Wide Dynamic Range settings:

```
PVT:WDR?
> 1
```

### 2.10.3 Noise Correction

## [:SENSe]:PVTime:NCORrection OFF|ON|0|1

Noise Correction

**Function**

This command sets the noise correction On/Off.

**Command**

```
[:SENSe]:PVTime:NCORrection <switch>
```

**Parameter**

| | |
|---|---|
| <switch> | Noise correction On/Off |
| ON\|1 | On |
| OFF\|0 | Off |

**Details**

Noise Correction can be set only when Wide Dynamic Range is set to On.

When Limiter Mode is On, Both Noise Correction and Pre-Amp Mode can be set to On at the same time.
When Limiter Mode is Off, Both Noise Correction and Pre-Amp Mode cannot be set to On at the same time.

If the measurement function is changed from Power vs Time to the other one, Noise Correction is switched to Off.

**Example of Use**

To set the noise correction to On:

```
PVT:NCOR ON
```

## [:SENSe]:PVTime:NCORrection?

Noise Correction Query

### Function

This command queries the Noise Correction settings.

### Query

```
[:SENSe]:PVTime:NCORrection?
```

### Response

```
<switch>
```

### Parameter

| | |
|---|---|
| `<switch>` | Noise correction On/Off |
| `1` | On |
| `0` | Off |

### Example of Use

To query the Noise Correction settings:

```
PVT:NCOR?
> 1
```

## 2.10.4 Pre-Amp Mode

[:SENSe]:PVTime:PAMode OFF|ON|0|1

Pre-Amp Mode

Function

This command sets the Pre-Amp Mode On/Off.
When the Pre-Amp mode is set to On, the Off Power measurement starts after setting Pre-Amp to On.

Command

```
[:SENSe]:PVTime:PAMode <switch>
```

Parameter

| | |
|---|---|
| <switch> | Pre-Amp Mode On/Off |
| OFF\|0 | Off |
| ON\|1 | On |

Details

This command is invalid if the Option 008 is NOT installed.

Details

Pre-Amp Mode can be set only when Wide Dynamic Range is On and Trigger Switch is On.
When Limiter Mode is On, Both Noise Correction and Pre-Amp Mode can be set to On at the same time. When Limiter Mode is Off, Both Noise Correction and Pre-Amp Mode cannot be set to On at the same time.

When the Pre-Amp Mode is On, the Peak value of the signal input to RF input is +10 dBm.

If the measurement function is changed from Power vs Time to the other one, Pre-Amp Mode is switched to Off.

Example of Use

To set Pre-Amp Mode to On:

```
PVT:PAM ON
```

## [:SENSe]:PVTime:PAMode?

Pre-Amp Mode Query

### Function

This command queries the Pre-Amp Mode settings.

### Query

`[:SENSe]:PVTime:PAMode?`

### Response

`<switch>`

### Parameter

| | |
|---|---|
| `<switch>` | Pre-Amp Mode On/Off |
| `0` | Off |
| `1` | On |

### Details

This command returns the Off value if the Option 008 is not installed.

### Example of Use

To query the Pre-Amp Mode settings:

```
PVT:PAM?
> 1
```

## 2.10.5 Select Mask

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

Select Mask

Function

This command sets the Mask line to be used for the judgement.

Command

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

Parameter

`<mode>`

| | |
|---|---|
| `STANdard` | Mask line specified by 3GPP |
| `USER` | Mask line set by User |

Example of Use

To set the user defined Mask line:

`PVT:MASK:SEL USER`

### [:SENSe]:PVTime:MASK:SELect?

Select Mask Query

Function

This command queries the Mask line to be used for the judgement.

Query

`[:SENSe]:PVTime:MASK:SELect?`

Response

`<mode>`

Parameter

`<mode>`

| | |
|---|---|
| `STAN` | Mask line specified by 3GPP |
| `USER` | Mask line set by User |

Example of Use

To query the Mask line:

```
PVT:MASK:SEL?
> USER
```

## 2.10.6 Mask Setup – Time Reference

### [:SENSe]:PVTime:MASK:TIME:REFerence ABSolute|RELative

Time Reference

Function

This command sets the Time Reference for the Start Time and Stop Time of the Mask line.

Command

```
[:SENSe]:PVTime:MASK:TIME:REFerence <mode>
```

Parameter

```
<mode>
```

| | |
|---|---|
| ABSolute | Time Reference: Abs. |
| RELative | Time Reference: Rel. |

Details

When Time Reference is Abs., the Start Time and Stop Time are absolute times referenced to the frame header.

When Time Reference is Rel., the Start Time and Stop Time are relative times referenced to the Transient section (On/Off switching boundary). The Transient position is calculated from the Uplink-downlink Configuration and Special Subframe Configuration settings.

Example of Use

To set Time Reference for Mask Start Time and Stop Time to Abs.

```
PVT:MASK:TIME:REF ABS
```

## [:SENSe]:PVTime:MASK:TIME:REFerence?

Time Reference Query

### Function

This command queries the Time Reference for the Start Time and Stop Time of the Mask line.

### Query

`[:SENSe]:PVTime:MASK:TIME:REFerence?`

### Response

`<mode>`

### Parameter

`<mode>`

| | |
|---|---|
| ABS | Time Reference:abs. |
| REL | Time Reference:rel. |

### Example of Use

To query the Time Reference for the Start Time and Stop Time of the Mask line:

```
PVT:MASK:TIME:REF?
>ABS
```

## 2.10.7 Mask Setup – Start Time

### [:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute <time_1>,<time_2>

Mask Setup – Start Time absolute

Function

This command sets the Start Time for UserMask to the absolute time from the start of the frame.

Command

```
[:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute
<time_1>,<time_2>
```

Parameter

| | |
|---|---|
| `<time_n>` | Start time (Gap n) |
| Range | 0 to 10 ms |
| Resolution | 10 ns |
| Unit | s |
| Suffix code | NS,US,MS,S<br>S is used when the suffix code is omitted. |

Example of Use

To set UserMask Start Time to 1 and 6 ms as absolute time from frame header.

```
PVT:MASK:LIST:TIME:STAR:ABS 0.001,0.006
```

## [:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute?

Mask Setup – Start Time absolute Query

### Function

This command reads the UserMask Start Time as an absolute value from the frame header.

### Query

```
[:SENSe]:PVTime:MASK:LIST:TIME:STARt:ABSolute?
```

### Response

```
<time_1>,<time_2>
```

### Parameter

| | |
|---|---|
| <time_n> | Start time (Gap n) |
| Range | 0 to 10 ms |
| Resolution | 10 ns |
| Unit | s |
| Suffix code | NS,US,MS,S<br>S is used when the suffix code is omitted. |

### Example of Use

To query UserMask Start Time as absolute time from frame header

```
PVT:MASK:LIST:TIME:STAR:ABS?
> 0.00100000,0.00600000
```

## [:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative <time_1>,<time_2>

Mask Setup – Start Time Relative

Function

This command sets the User Mask Start Time as a relative time from the Transient part.

Command

`[:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative <time_1>,<time_2>`

Parameter

`<time_n>` Start time (Gap n)

Range when U/D Config is 0 to 6 at GAP1

–1.21458 to 8.78542 ms (When SS Config is 0 or 5)
–1.64323 to 8.35677 ms (When SS Config is 1 or 6)
–1.71458 to 8.28542 ms (When SS Config is 2 or 7)
–1.78594 to 8.21406 ms (When SS Config is 3 or 8)
–1.85729 to 8.14271 ms (When SS Config is 4)

Range when U/D Config is 0, 1, 2 and 6 at GAP2

–6.21458 to 3.78542 ms (When SS Config is 0 or 5)
–6.64323 to 3.35677 ms (When SS Config is 1 or 6)
–6.71458 to 3.28542 ms (When SS Config is 2 or 7)
–6.78594 to 3.21406 ms (When SS Config is 3 or 8)
–6.85729 to 3.14271 ms (When SS Config is 4)

Resolution 10 ns
Unit s
Suffix code NS,US,MS,S
S is used when the suffix code is omitted.

Example of Use

To set the User Mask Start Time to 17 and 17 ms as a relative time from the Transient part.

`PVT:MASK:LIST:TIME:STAR:REL 17US,17US`

## [:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative?

Mask Setup - Start Time Relative Query

### Function

This command queries the User Mask Start Time as a relative time from the Transient part.

### Query

```
[:SENSe]:PVTime:MASK:LIST:TIME:STARt:RELative?
```

### Response

```
<time_1>,<time_2>
```

### Parameter

`<time_n>` Start time (Gap n)

Range when U/D Config is 0 to 6 at GAP1

–1.21458 to 8.78542 ms (When SS Config is 0 or 5)
–1.64323 to 8.35677 ms (When SS Config is 1 or 6)
–1.71458 to 8.28542 ms (When SS Config is 2 or 7)
–1.78594 to 8.21406 ms (When SS Config is 3 or 8)
–1.85729 to 8.14271 ms (When SS Config is 4)

Range when U/D Config is 0, 1, 2 and 6 at GAP2

–6.21458 to 3.78542 ms (When SS Config is 0 or 5)
–6.64323 to 3.35677 ms (When SS Config is 1 or 6)
–6.71458 to 3.28542 ms (When SS Config is 2 or 7)
–6.78594 to 3.21406 ms (When SS Config is 3 or 8)
–6.85729 to 3.14271 ms (When SS Config is 4)

Resolution 10 ns
Unit S
Suffix code NS,US,MS,S
S is used when the suffix code is omitted.

### Example of Use

To query the User Mask Start Time as a relative time from the Transient part

```
PVT:MASK:LIST:TIME:STAR:REL?
> 0.00001700,0.00001700
```

SCPI Device Message Details

## 2.10.8 Mask Setup – Stop Time

### [:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute <time_1>,<time_2>

Mask Setup – Stop Time Absolute

Function

This command sets the User Mask Stop Time as an absolute time from the frame header.

Command

```
[:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute
<time_1>,<time_2>
```

Parameter

| | |
|---|---|
| `<time_n>` | Stop time (Gap n) |
| Range | 0 to 10 ms |
| Resolution | 10 ns |
| Unit | s |
| Suffix code | NS,US,MS,S<br>S is used when the suffix code is omitted. |

Example of Use

To set the User Mask Stop Time to 5 and 8 ms as an absolute time from the frame header.

```
PVT:MASK:LIST:TIME:STOP:ABS 0.005,0.008
```

## [:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute?

Mask Setup – Stop Time Absolute Query

Function

This command queries the User Mask Stop Time as an absolute time from the frame header.

Query

[:SENSe]:PVTime:MASK:LIST:TIME:STOP:ABSolute?

Response

```
<time_1>,<time_2>
```

Parameter

| | |
|---|---|
| <time_n> | Stop time (Gap n) |
| Range | 0 to 10 ms |
| Resolution | 10 ns |
| Unit | S |
| Suffix code | NS,US,MS,S<br>S is used when the suffix code is omitted. |

Example of Use

To query the User Mask Stop Time as an absolute time from the frame header.

```
PVT:MASK:LIST:TIME:STOP:ABS?
> 0.00500000,0.00800000
```

## [:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative <time_1>,<time_2>

Mask Setup – Stop Time Relative

Function

This command sets the User Mask Stop Time as a relative time from the Transient part.

Command

```
[:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative
<time_1>,<time_2>
```

Parameter

`<time_n>` Stop time (Gap n)

Range at GAP1

–5.00000 to 5.00000 ms (When U/D Config is 0)
–4.00000 to 6.00000 ms (When U/D Config is 1)
–3.00000 to 7.00000 ms (When U/D Config is 2)
–5.00000 to 5.00000 ms (When U/D Config is 3)
–4.00000 to 6.00000 ms (When U/D Config is 4)
–3.00000 to 7.00000 ms (When U/D Config is 5)
–5.00000 to 5.00000 ms (When U/D Config is 6)

Rage at GAP2

–10.00000 to 0.00000 ms (When U/D Config is 0)
–9.00000 to 1.00000 ms (When U/D Config is 1)
–8.00000 to 2.00000 ms (When U/D Config is 2)
— (When U/D Config is 3)
— (When U/D Config is 4)
— (When U/D Config is 5)
–9.00000 to 1.00000 ms (When U/D Config is 6)

| | |
|---|---|
| Resolution | 10 ns |
| Unit | S |
| Suffix code | NS,US,MS,S<br>S is used when the suffix code is omitted |

Example of Use

To set the User Mask Stop Time as a relative time from the Transient part to 17 μs

```
PVT:MASK:LIST:TIME:STOP:REL -0.000017,-0.000017
```

## [:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative?

Mask Setup – Stop Time Relative Query

Function

This command queries the User Mask Stop Time as a relative time from the Transient part.

Query

```
[:SENSe]:PVTime:MASK:LIST:TIME:STOP:RELative?
```

Response

```
<time_1>,<time_2>
```

Parameter

`<time_n>` Stop time (Gap n)

Range at GAP1

–5.00000 to 5.00000 ms (When U/D Config is 0)
–4.00000 to 6.00000 ms (When U/D Config is 1)
–3.00000 to 7.00000 ms (When U/D Config is 2)
–5.00000 to 5.00000 ms (When U/D Config is 3)
–4.00000 to 6.00000 ms (When U/D Config is 4)
–3.00000 to 7.00000 ms (When U/D Config is 5)
–5.00000 to 5.00000 ms (When U/D Config is 6

Rage at GAP2

–10.00000 to 0.00000 ms (When U/D Config is 0)
–9.00000 to 1.00000 ms (When U/D Config is 1)
–8.00000 to 2.00000 ms (When U/D Config is 2)
— (When U/D Config is 3))
— (When U/D Config is 4)
— (When U/D Config is 5)
–9.00000 to 1.00000 ms (When U/D Config is 6)

Resolution 10 ns
Unit s

Example of Use

To query the User Mask Stop Time as a relative time from the Transient part.

```
PVT:MASK:LIST:TIME:STOP:REL?
> -0.00001700,-0.00001700
```

## 2.10.9 Mask Setup – Off Power limit

### [:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute <level>

Mask Setup - Level

Function

This command sets the Off Power limit of the User Mask.

Command

```
[:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute <level>
```

Parameter

<level>

| | |
|---|---|
| Range | –110.00 to –40.00 |
| Resolution | 0.01 |
| Unit | dBm/MHz |
| Suffix code | DBM<br>dBm/MHz is used when the suffix code is omitted<br>dBm/MHz is used even when DBM is used. |

Example of Use

To set the Off Power limit of the User Mask to –85.0 dBm/MHz.

```
PVT:MASK:LIST:LIM:ABS -85.0
```

### [:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute?

Mask Setup - Level Query

Function

This command queries the level of the User Mask.

Query

```
[:SENSe]:PVTime:MASK:LIST:LIMit:ABSolute?
```

Response

<level>

Parameter

<level>

| | |
|---|---|
| Range: | –110.00 to –40.00 |
| Resolution: | 0.01 |
| Unit: | dBm/MHz |

Example of Use

To query the level of the User Mask

```
PVT:MASK:LIST:LIM:ABS?
> -85.00
```

## 2.10.10 Load Standard Setting

### [:SENSe]:PVTime:MASK:LSSetting

Load Standard Setting

Function

This command copies the Standar Mask settings to the User Mask.

Command

```
[:SENSe]:PVTime:MASK:LSSetting
```

Example of Use

To copy the Standard Mask settings to the User Mask.

```
PVT:MASK:LSS
```

## 2.10.11 Smoothing Mode

### [:SENSe]:PVTime:SMOothing[:STATe] OFF|ON|0|1

Smoothing Mode

**Function**

This command sets the Smoothing On/Off.

**Command**

```
[:SENSe]:PVTime:SMOothing[:STATe] <switch>
```

**Parameter**

| | |
|---|---|
| <Switch> | Smoothing On/Off |
| 0\|OFF | Off |
| 1\|ON | On |

**Example of Use**

To set Smoothing to On.

```
PVT:SMO ON
```

### [:SENSe]:PVTime:SMOothing[:STATe]?

Smoothing Query

**Function**

This command queries the Smoothing settings.

**Query**

```
[:SENSe]:PVTime:SMOothing[:STATe]?
```

**Response**

| | |
|---|---|
| <Switch> | Smoothing On/Off |
| 0 | Off |
| 1 | On |

**Example of Use**

To query the smoothing settings.

```
PVT:SMO?
>1
```

## 2.10.12 Smoothing Length

### [:SENSe]:PVTime:SMOothing:LENGth <integer>

Smoothing Length

Function

This command sets the Smoothing length.

Command

```
[:SENSe]:PVTime:SMOothing:LENGth <integer>
```

Parameter

`<integer>`

| | |
|---|---|
| Range | 1 to 2151 |
| Resolution | 1 |
| Default | 2151 |
| Unit: | Ts |

Example of Use

To set the Smoothing length to 101 Ts.

```
PVT:SMO:LENG 101
```

### [:SENSe]:PVTime:SMOothing:LENGth?

Smoothing Length Query

Function

This command queries the Smoothing length.

Query

```
[:SENSe]:PVTime:SMOothing:LENGth?
```

Response

`<Integer>`

| | |
|---|---|
| Resolution | 1 |
| Unit | Ts |

Example of Use

To read the Smoothing length.

```
PVT:SMO:LENG?
> 101
```

## 2.10.13 Smoothing Range

### [:SENSe]:PVTime:SMOothing:RANGe MASK|ENTire

Smoothing Range

Function

This command sets the Smoothing range.

Command

```
[:SENSe]:PVTime:SMOothing:RANGe <mode>
```

Parameter

| | |
|---|---|
| <mode> | Smoothing range |
| MASK | Only between the Mask lines set by Mask Setup |
| ENTire | Entire waveform |

Example of Use

To set the Smoothing range to Mask.

```
PVT:SMO:RANG MASK
```

### [:SENSe]:PVTime:SMOothing:RANGe?

Smoothing Range Query

Function

This command queries the Smoothing range.

Query

```
[:SENSe]:PVTime:SMOothing:RANGe?
```

Response

| | |
|---|---|
| <mode> | Smoothing range |
| MASK | Only between the Mask lines set by Mask Setup |
| ENT | Entire waveform |

Example of Use

To query the Smoothing range.

```
PVT:SMO:RANG?
> MASK
```

## 2.10.14 Storage Mode

### [:SENSe]:PVTime:AVERage[:STATe] OFF|ON|0|1

Storage Mode for Power vs Time

Function

This command sets the Storage mode.

Command

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

Parameter

<mode>

| | |
|---|---|
| 0\|OFF | Sets Storage Mode to Off (Disable). |
| 1\|ON | Sets Storage Mode to Average (Enable). |

Example of Use

To set the Storage Mode to On (Average):

```
PVT:AVER ON
```

### [:SENSe]:PVTime:AVERage[:STATe]?

Storage Mode for Power vs Time Query

Function

This command queries the Storage mode settings.

Query

```
[:SENSe]:PVTime:AVERage[:STATe]?
```

Response

<mode>

| | |
|---|---|
| 0 | Storage mode: Off |
| 1 | Storage mode: Average |

Example of Use

To query the Storage mode settings.

```
PVT:AVER?
> 1
```

## 2.10.15 Storage Count

### [:SENSe]:PVTime:AVERage:COUNt <integer>

Average Count for Power vs Time

Function

This command sets the Storage count.

Command

`[:SENSe]:PVTime:AVERage:COUNt <integer>`

Parameter

`<integer>`

| | |
|---|---|
| Range | 2 to 999 |
| Default | 10 |
| Resolution | 1 |
| Unit | None |

Example of Use

To set the Storage count to 20:

```
PVT:AVER:COUN 20
```

### [:SENSe]:PVTime:AVERage:COUNt?

Average Count for Power vs Time Query

Function

This command queries the Storage count.

Query

`[:SENSe]:PVTime:AVERage:COUNt?`

Response

`<integer>`

Resolution 1

Example of Use

To query the Storage count.

```
PVT:AVER:COUN?
>20
```

## 2.10.16 Marker – ON/OFF

### :CALCulate:PVTime:MARKer[:STATe] OFF|ON|0|1

Marker On/Off for Power vs Time

Function

This command sets the Marker On/Off.

Command

```
:CALCulate:PVTime:MARKer[:STATe] <switch>
```

Parameter

| | |
|---|---|
| <switch> | Marker On/Off |
| OFF\|0 | Off |
| ON\|1 | On |

Example of Use

To display the marker.

```
CALC:PVT:MARK ON
```

### :CALCulate:PVTime:MARKer[:STATe]?

Marker On/Off for Power vs Time Query

Function

This command queries the Marker settings.

Query

```
:CALCulate:PVTime:MARKer[:STATe]?
```

Response

| | |
|---|---|
| <switch> | Marker On/Off |
| 0 | Off |
| 1 | On |

Example of Use

To query the Marker settings.

```
CALC:PVT:MARK?
> 1
```

## 2.10.17 Top Graph Marker Number

### :CALCulate:PVTime:WINDow[1]:MARKer:SYMBol <real>

Marker Position for Top Graph

Function

This command sets the Top Graph Marker.

Command

`:CALCulate:PVTime:WINDow[1]:MARKer:SYMBol <real>`

Parameter

`<real>`

| | |
|---|---|
| Range | 0 to 139.75 |
| Resolution | 0.25 |
| Unit | Symbol |

Example of Use

To set Top Graph Marker to 100 symbol:

`CALC:PVT:WIND:MARK:SYMB 100`

### :CALCulate:PVTime:WINDow[1]:MARKer :SYMBol?

Marker Position for Top Graph – Query

Function

This command queries the Top Graph Marker position.

Query

`:CALCulate:PVTime:WINDow[1]:MARKer:SYMBol?`

Response

`<symbol>`

| | |
|---|---|
| Resolution | 0.25 |
| Unit | Symbol |

Example of Use

To query the Top Graph Marker position:

```
CALC:PVT:WIND:MARK:SYMB?
> 100.00
```

### 2.10.18 Top Graph Marker to Transient

:CALCulate:PVTime:WINDow[1]:MARKer:TRANsient

Top Graph Marker Position move to Transient

Function

This command moves the Top Graph Marker to the Transient part.

Command

```
:CALCulate:PVTime:WINDow[1]:MARKer:TRANsient
```

Details

The position of the Transient part is calculated from the Uplink-downlink Configuration and Special Subframe Configuration settings.

Example of Use

To move the Top Graph Marker to the Transient part.

```
CALC:PVT:WIND:MARK:TRAN
```

### 2.10.19 Top Graph Marker to Fail

:CALCulate:PVTime:WINDow[1]:MARKer:FAIL

Top Graph Marker Position move to Fail

Function

This command moves the Top Graph Marker to the Fail part.

Command

```
:CALCulate:PVTime:WINDow[1]:MARKer:FAIL
```

Example of Use

To move the Top Graph Marker to the Fail part.

```
CALC:PVT:WIND:MARK:FAIL
```

## 2.10.20 Bottom Graph Marker Number

### :CALCulate:PVTime:WINDow2:MARKer:TS <integer>

Bottom Graph Marker

Function

This command sets the Bottom Graph Marker Position.

Command

```
:CALCulate:PVTime:WINDow2:MARKer:TS <integer>
```

Parameter

`<integer>`

| | |
|---|---|
| Range | Display range for Bottom Graph |
| Resolution | 1 |
| Unit | Ts |

Example of Use

To set the Bottom Graph Marker position to 1536 Ts.

```
CALC:PVT:WIND2:MARK:TS 1536
```

### :CALCulate:PVTime:WINDow2:MARKer:TS?

Bottom Graph Marker Query

Function

This command queries the Bottom Graph Marker position in Ts units.

Query

```
:CALCulate:PVTime:WINDow2:MARKer:TS?
```

Response

`<integer>`

Parameter

`<integer>`

| | |
|---|---|
| Resolution | 1 |
| Unit | Ts |

Example of Use

To query the Bottom Graph Marker position in Ts units.

```
CALC:PVT:WIND2:MARK:TS?
> 1536
```

## :CALCulate:PVTime:WINDow2:MARKer:TIME?

Bottom Graph Marker Query

**Function**

This command queries the Bottom Graph Marker position in seconds.

**Query**

```
:CALCulate:PVTime:WINDow2:MARKer:TIME?
```

**Response**

```
<time>
```

**Parameter**

```
<time>
```

Unit s

**Example of Use**

To query the Bottom Graph Marker position in second units.

```
CALC:PVT:WIND2:MARK:TIME?
> 0.000050000
```

## 2.10.21 Bottom Graph Marker Value

:CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute[1]?

Bottom Graph Marker Power

Function

This command queries the Power value of the Bottom Graph Marker position in dBm units.

Query

```
:CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute[1]?
```

Response

```
<power>
```

Parameter

```
<power>
```

| | |
|---|---|
| Resolution | 0.01 |
| Unit | dBm |

Example of Use

To query the Power value of the Bottom Graph Marker position.

```
CALC:PVT:WIND2:MARK:POW:ABS?
> -78.45
```

## :CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute2?

Bottom Graph Marker Power

**Function**

This command queries the Power value of the Bottom Graph Marker position in dBm/MHz units.

**Query**

```
:CALCulate:PVTime:WINDow2:MARKer:POWer:ABSolute[2]?
```

**Response**

```
<power>
```

**Parameter**

```
<power>
```

| | |
|---|---|
| Resolution | 0.01 |
| Unit | dBm/MHz |

**Example of Use**

To query the Power value of the Bottom Graph Marker position.

```
CALC:PVT:WIND2:MARK:POW:ABS2?
> -85.00
```

## :CALCulate:PVTime:WINDow2:MARKer:JUDGe?

Bottom Graph Marker Judge

Function

This command queries the Pass/Fail judgement of the Bottom Graph Marker position.

Query

```
:CALCulate:PVTime:WINDow2:MARKer:JUDGe?
```

Response

```
<judge>
```

Parameter

```
<judge>
```

| | |
|---|---|
| 0 | Pass |
| 1 | Fail |

Example of Use

To query the Pass/Fail judgement of the Bottom Graph Marker position.

```
CALC:PVT:WIND2:MARK:JUDG?
> 0
```

### 2.10.22 Peak Search(Margin)

:CALCulate:PVTime:WINDow2:MARKer:MAXimum

Peak Search

Function

This command finds the point with the maximum difference between the Bottom Graph Mask value and measured value and moves the marker to that point.

Command

```
:CALCulate:PVTime:WINDow2:MARKer:MAXimum
```

Details

To query the measurement results after executing this command, use the *WAI command to control synchronization.
Note that synchronization control during the Continuous mode is not supported.

Example of Use

To move the marker to the maximum level point and query the marker value.

```
CALC:PVT:WIND2:MARK:MAX
*WAI
CALC:PVT:WIND2:MARK:POW:ABS?
> -85.10
```

## :CALCulate:PVTime:WINDow2:MARKer:MAXimum:NEXT

Next Peak Search

### Function

This command finds the point where difference between the Bottom Graph Mask value and measured value is smaller than the difference from the current marker point and moves the marker to that point.

### Command

```
:CALCulate:PVTime:WINDow2:MARKer:MAXimum:NEXT
```

### Details

To query the measurement results after executing this command, use the *WAI command to control synchronization
Note that synchronization control during the Continuous mode is not supported.

### Example of Use

To move the marker to the next peak point and query the marker value.

```
CALC:PVT:WIND2:MARK:MAX:NEXT
*WAI
CALC:PVT:WIND2:MARK:POW:ABS?
> -85.20
```

## 2.10.23 Frame Sync

### [:SENSe]:PVTime:FSYNc OFF|ON|0|1

Frame Sync

Function

This command sets the Frame Sync On/Off.

Command

`[:SENSe]:PVTime:FSYNc <switch>`

Parameter

| | |
|---|---|
| `<switch>` | Frame Sync On/Off |
| `0|OFF` | Off |
| `1|ON` | On |

Details

If Trigger Switch is set to Off, this function is fixed to On.
If Limiter Mode is set to On, this function is fixed to Off.

Example of Use

To set the Frame Sync to Off.

```
PVT:FSYN OFF
```

### [:SENSe]:PVTime:FSYNc?

Frame Sync Query

Function

This command queries the Frame Sync settings.

Query

`[:SENSe]:PVTime:FSYNc?`

Response

| | |
|---|---|
| `<switch>` | Frame Sync On/Off |
| `0` | Off |
| `1` | On |

Example of Use

To query the Frame Sync settings.

```
PVT:FSYN?
> 0
```

2

SCPI Device Message Details

## 2.10.24 Limiter Mode

### [:SENSe]:PVTime:LMODe OFF|ON|0|1

Limiter Mode

Function

This command sets the Limiter Mode On/Off.

Command

```
[:SENSe]:PVTime:LMODe <switch>
```

Parameter

| | |
|---|---|
| <switch> | Limiter Mode On/Off |
| 0\|OFF | Off |
| 1\|ON | On |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

This can be set only when Wide Dynamic Range is On and Trigger Switch is On. If the measurement function is changed from Power vs Time to the other one, Limiter Mode is switched to Off.

Example of Use

To set the Limiter Mode to On.

```
PVT:LMOD ON
```

### [:SENSe]:PVTime:LMODe?

Limiter Mode Query

Function

This command queries the Limiter Mode settings.

Query

```
[:SENSe]:PVTime:SMOothing:RANGe?
```

Response

| | |
|---|---|
| <switch> | Limiter Mode On/Off |
| 0 | Off |
| 1 | On |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

Example of Use

To query the Limiter Mode settings.

```
PVT:LMOD?
> 1
```

### 2.10.25 Limiter Mode ATT

[:SENSe]:PVTime:LMODe:ATTenuation <rel_ampl>

Limiter Mode ATT

**Function**

This command sets the Limiter Mode ATT value.

**Command**

```
[:SENSe]:PVTime:LMODe:ATTenuation <rel_ampl>
```

**Parameter**

| | |
|---|---|
| `<rel_ampl>` | Attenuation |
| Range | 0 to 60 dB |
| Resolution | 2 dB |
| Suffix code | DB<br>dB when omitted |
| Default | 2 dB |

**Details**

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
This can be set only when Limiter Mode is set to On.
When Limiter Mode is On, the attenuator set by Limiter Mode ATT is set to noise level measurement and Off Power measurement, regardless of Input Level.
The signal to input to the MS2690A/MS2691A/MS2692A must be lower than its maximum input level.
Especially when Pre-AMP Mode is set to On, pay attention to the maximum input level of MS2690A/MS2691A/MS2692A because Pre-Amp is turned on accordingly.

**Example of Use**

To set the Limiter Mode ATT to 0 dB.

```
PVT:LMOD:ATT 0DB
```

## [:SENSe]:PVTime:LMODe:ATTenuation?

Limiter Mode ATT Query

### Function

This command queries the Limiter Mode ATT value.

### Query

```
[:SENSe]:PVTime:LMODe:ATTenuation?
```

### Response

| | |
|---|---|
| <rel_ampl> | Attenuation |
| Range | 0 to 60 dB |
| Resolution | 2 dB |

### Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

### Example of Use

To query the Limiter Mode ATT value.

```
PVT:LMOD:ATT?
> 0
```

### 2.10.26 Limiter Mode Offset

## [:SENSe]:PVTime:LMODe:OFFSet:STATe OFF|ON|0|1

Limiter Mode Offset State

Function

This command sets the Limiter Mode Offset On/Off.

Command

```
[:SENSe]:PVTime:LMODe:OFFSet:STATe <switch>
```

Parameter

| | |
|---|---|
| <switch> | Limiter Mode Offset On/Off |
| 0\|OFF | Off |
| 1\|ON | On |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
This can be set only when Limiter Mode is set to On.

Example of Use

To set the Limiter Mode Offset to On.

```
PVT:LMOD:OFFS:STAT ON
```

## [:SENSe]:PVTime:LMODe:OFFSet:STATe?

Limiter Mode Offset State Query

Function

This command queries the Limiter Mode Offset On/Off.

Query

```
[:SENSe]:PVTime:LMODe:OFFSet:STATe?
```

Response

| | |
|---|---|
| <switch> | Limiter Mode Offset On/Off |
| 0 | Off |
| 1 | On |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

Example of Use

To query the Limiter Mode Offset On/Off.

```
PVT:LMOD:OFFS:STAT?
> 1
```

## 2.10.27 Limiter Mode Offset Value

### [:SENSe]:PVTime:LMODe:OFFSet <rel_power>

Limiter Mode Offset Value

Function

This command sets the Limiter Mode Offset Value.

Command

```
[:SENSe]:PVTime:LMODe:OFFSet <rel_power>
```

Parameter

| | |
|---|---|
| <rel_power> | Offset Value |
| Range | –99.99 to +99.99 dB |
| Resolution | 0.01 dB |
| Suffix code | DB |
| | dB when omitted |
| Default | 0 dB |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
This can be set only when Limiter Mode is set to On.

Example of Use

To set the Limiter Mode Offset Value to 10 dB.

```
PVT:LMOD:OFFS 10DB
```

### [:SENSe]:PVTime:LMODe:OFFSet?

Limiter Mode Offset Value Query

Function

This command queries the Limiter Mode Offset Value.

Query

```
[:SENSe]:PVTime:LMODe:OFFSet?
```

Response

| | |
|---|---|
| <rel_power> | Offset Value |
| Range | –99.99 to +99.99 dB |
| Resolution | 0.01 dB |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

Example of Use

To query the Limiter Mode Offset Value.

```
PVT:LMOD:OFFS?
> 10.00
```

### 2.10.28 Noise Correction Mode

[:SENSe]:PVTime:LMODe:NCORrection:MODE AUTO|MANual

Noise Correction Mode

Function

This command sets the Noise Correction Mode.

Command

```
[:SENSe]:PVTime:LMODe:NCORrection:MODE <mode>
```

Parameter

| | |
|---|---|
| <mode> | Noise Correction Mode |
| AUTO | Performs noise level measurement for Noise Correction every time Power vs Time measurement is performed. |
| MANual | Performs noise level measurement for Noise Correction only when the Noise Calculate command is sent. |

Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

This can be set only when Noise Correction is set to On and Limiter Mode is set to On.

Example of Use

To set the Noise Correction Mode to Manual.

```
PVT:LMOD:NCOR:MODE MAN
```

## [:SENSe]:PVTime:LMODe:NCORrection:MODE?

Noise Correction Mode Query

### Function

This command queries the Noise Correction Mode settings.

### Query

`[:SENSe]:PVTime:LMODe:NCORrection:MODE?`

### Response

| | |
|---|---|
| `<mode>` | Noise Correction Mode |
| AUTO | Performs noise level measurement for Noise Correction every time Power vs Time measurement is performed. |
| MAN | Performs noise level measurement for Noise Correction only when the Noise Calculate command is sent. |

### Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.

### Example of Use

To query the Noise Correction Mode settings

```
PVT:LMOD:NCOR:MODE?
> MAN
```

### 2.10.29 Noise Calculate

[:SENSe]:PVTime:LMODe:NCORrection:CALCulate

Noise Calculate

**Function**

This command performs the Noise Level measurement.

**Command**

```
[:SENSe]:PVTime:LMODe:NCORrection:CALCulate
```

**Details**

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
This can be set only when Noise Correction Mode is set to Manual.
The measured noise level is stored in the memory area for the MX269022A and is used by the Off Power measurement if Noise Correction is set to On. The measured noise level is initialized by turning off the power of the MS2690A/MS2691A/MS2692A or quitting the MX269022A, but is not initialized by Preset or switching the measurement function.

**Example of Use**

To perform the Noise Levele measurement

```
PVT:LMOD:NCOR:CALC
```

## 2.10.30 Power vs Time Limiter Mode Continue

### :INITiate:PVTime:LMODe:CONTinue

Power vs Time Limiter Mode Continue

**Function**

This command resumes the Power vs Time measurement that has been paused in remote control state and in Limiter Mode.

**Command**

`:INITiate:PVTime:LMODe:CONTinue`

**Details**

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
If Wide Dynamic Range is set On and Limiter Mode is set to On, the Power vs Time measurement pauses before:

- Noise Level measurement for Noise Correction (when Noise Correction is On and Noise Correction Mode is Auto)
- Off Power measurement
- On Power measurement

This command is used to resume the paused measurement.

This command is available only when the measurement has been paused in remote control state. If this command is sent in local control state, the paused measurement is aborted. Press 

(Continue) to continue the measurement that is in local control state.

To query the measurement results after executing this command, use the *WAI command to control synchronization

**Example of Use**

To perform the Noise Level measurement.

| | |
|---|---|
| `INIT:PVT` | To start the Power vs Time measurement |
| `*WAI` | To wait until the measurement pauses |
| `INIT:PVT:LMOD:CONT` | To resume the paused measurement (Noise Level measurement) |
| `*WAI` | To wait until the measurement pauses |
| `INIT:PVT:LMOD:CONT` | To resume the paused measurement (Off Power measurement) |
| `*WAI` | To wait until the measurement pauses |
| `INIT:PVT:LMOD:CONT` | To resume the paused measurement (On Power measurement) |

# :INITiate:PVTime:LMODe:STATe?

Power vs Time Limiter Mode Status Query

## Function

This command queries whether the Power vs Time measurement in Limiter Mode is in remote control state and has been paused.

## Query

`:INITiate:PVTime:LMODe:STATe?`

## Response

| | |
|---|---|
| <switch> | State of the Power vs Time measurement |
| 1 | Paused in remote control state |
| 0 | Other |

## Details

This command is available on the MS2690A/MS2691A/MS2692A, and is not available on the MS2830A.
If Wide Dynamic Range is set On and Limiter Mode is set to On, the Power vs Time measurement pauses before:

- Noise Level measurement for Noise Correction (when Noise Correction is On and Noise Correction Mode is Auto)
- Off Power measurement
- On Power measurement

This command is used to query whether the Power vs Time measurement has been paused.

This command is available only when the measurement has been paused in remote control state.

## Example of Use

To query whether the Power vs Time measurement has been paused in remote control state.

```
INIT:PVT:LMOD:STAT?
> 1
```

# 2.11 MIMO Summary Measurement Function

This section describes the device messages related to MIMO Summary measurement.

Table 2.11-1 lists the device messages used for execution and result query of MIMO Summary measurement.

**Table 2.11-1 Device Messages for MIMO Summary Measurement Functions**

| Function | Device Message |
|---|---|
| Configure | :CONFigure:MIMO |
| Initiate | :INITiate:MIMO |
| Fetch | :FETCh:MIMO[n]? |
| Read/Measure | :READ:MIMO[n]? |
| | :MEASure:MIMO[n]? |

Table 2.11-1 lists the responses to parameter [n] of the device messages in Table 2.11-2.

Table 2.11-2 Responses to MIMO Summary Measurement Result

| N | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | Responses are returned with comma-separated value formats in the following order:<br>1. RS power of Antenna port 0 (Average)<br>2. RS power of Antenna port 0 (Max)<br>3. RS EVM (rms) of Antenna port 0 (Average)<br>4. RS EVM (rms) of Antenna port 0 (Max)<br>5. Timing Offset of Antenna port 0 (Average)<br>6. Timing Offset of Antenna port 0 (Max)<br>7. RS Phase of Antenna port 0 (Average)<br>8. RS Phase of Antenna port 0 (Max)<br>9. RS Freq of Antenna port 0 (Average)<br>10. RS Freq of Antenna port 0 (Max)<br>11. RS power (dBm) of Antenna port 0 (Average)<br>12. RS power (dBm) of Antenna port 0 (Max)<br>13. –999.0<br>14. –999.0<br>15. –999.0<br>16. –999.0<br>17. –999.0<br>18. –999.0<br>19. –999.0<br>20. –999.0 |

Table 2.11-2 Responses to MIMO Summary Measurement Result (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 21. RS power of Antenna port 1 (Average)<br>22. RS power of Antenna port 1 (Max)<br>23. RS EVM (rms) of Antenna port 1 (Average)<br>24. RS EVM (rms) of Antenna port 1 (Max)<br>25. Timing Offset of Antenna port 1 (Average)<br>26. Timing Offset of Antenna port 1 (Max)<br>27. RS Phase of Antenna port 1 (Average)<br>28. RS Phase of Antenna port 1 (Max)<br>29. RS Freq of Antenna port 1 (Average)<br>30. RS Freq of Antenna port 1 (Max)<br>31. RS power (dBm) of Antenna port 1 (Average)<br>32. RS power (dBm) of Antenna port 1 (Max)<br>33. –999.0<br>34. –999.0<br>35. –999.0<br>36. –999.0<br>37. –999.0<br>38. –999.0<br>39. –999.0<br>40. –999.0<br>41. RS power of Antenna port 2 (Average)<br>42. RS power of Antenna port 2 (Max)<br>43. RS EVM (rms) of Antenna port 2 (Average)<br>44. RS EVM (rms) of Antenna port 2 (Max)<br>45. Timing Offset of Antenna port 2 (Average)<br>46. Timing Offset of Antenna port 2 (Max)<br>47. RS Phase of Antenna port 2 (Average)<br>48. RS Phase of Antenna port 2 (Max)<br>49. RS Freq of Antenna port 2 (Average)<br>50. RS Freq of Antenna port 2 (Max)<br>51. RS power (dBm) of Antenna port 2 (Average)<br>52. RS power (dBm) of Antenna port 2 (Max)<br>53. –999.0<br>54. –999.0<br>55. –999.0<br>56. –999.0<br>57. –999.0<br>58. –999.0<br>59. –999.0<br>60. –999.0 |

Table 2.11-2 Responses to MIMO Summary Measurement Result (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 1 or omitted | A/B | 61. RS power of Antenna port 3 (Average)<br>62. RS power of Antenna port 3 (Max)<br>63. RS EVM (rms) of Antenna port 3 (Average)<br>64. RS EVM (rms) of Antenna port 3 (Max)<br>65. Timing Offset of Antenna port 3 (Average)<br>66. Timing Offset of Antenna port 3 (Max)<br>67. RS Phase of Antenna port3 (Average)<br>68. RS Phase of Antenna port3 (Max)<br>69. RS Freq of Antenna port 3 (Average)<br>70. RS Freq of Antenna port 3 (Max)<br>71. RS power (dBm) of Antenna port 3 (Average)<br>72. RS power (dBm) of Antenna port 3 (Max)<br>73. –999.0<br>74. –999.0<br>75. –999.0<br>76. –999.0<br>77. –999.0<br>78. –999.0<br>79. –999.0<br>80. –999.0 |
| 10 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna0 Spectrum flatness amplitude<br>1. 0th subcarrier Antenna0 Spectrum flatness amplitude<br>2. 1st subcarrier Antenna0 Spectrum flatness amplitude<br>…<br>N. (N–1)th subcarrier Antenna0 Spectrum flatness amplitude |
| 11 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna1 Spectrum flatness amplitude<br>1. 0th subcarrier Antenna1 Spectrum flatness amplitude<br>2. 1st subcarrier Antenna1 Spectrum flatness amplitude<br>…<br>N. (N–1)th subcarrier Antenna1 Spectrum flatness amplitude |
| 12 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna2 Spectrum flatness amplitude<br>1. 0th subcarrier Antenna2 Spectrum flatness amplitude<br>2. 1st subcarrier Antenna2 Spectrum flatness amplitude<br>…<br>N. (N–1)th subcarrier Antenna2 Spectrum flatness amplitude |

Table 2.11-2 Responses to MIMO Summary Measurement Result (Cont'd)

| N | Result Mode | Response |
|---|---|---|
| 13 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna3 Spectrum flatness amplitude<br>1. 0th subcarrier Antenna3 Spectrum flatness amplitude<br>2. 1st subcarrier Antenna3 Spectrum flatness amplitude<br>…<br>N. (N–1)th subcarrier Antenna3 Spectrum flatness amplitude |
| 18 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna0 Spectrum flatness phase<br>1. 0th subcarrier Antenna0 Spectrum flatness phase<br>2. 1st subcarrier Antenna0 Spectrum flatness phase<br>…<br>N. (N–1)th subcarrier Antenna0 Spectrum flatness phase |
| 19 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna1 Spectrum flatness phase<br>1. 0th subcarrier Antenna1 Spectrum flatness phase<br>2. 1st subcarrier Antenna1 Spectrum flatness phase<br>…<br>N. (N–1)th subcarrier Antenna1 Spectrum flatness phase |
| 20 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna2 Spectrum flatness phase<br>1. 0th subcarrier Antenna2 Spectrum flatness phase<br>2. 1st subcarrier Antenna2 Spectrum flatness phase<br>…<br>N. (N–1)th subcarrier Antenna2 Spectrum flatness phase |
| 21 | A/B | Responses are returned with comma-separated value formats in the following order:<br>1 to N Antenna3 Spectrum flatness phase<br>1. 0th subcarrier Antenna3 Spectrum flatness phase<br>2. 1st subcarrier Antenna3 Spectrum flatness phase<br>…<br>N. (N–1)th subcarrier Antenna3 Spectrum flatness phase |

Table 2.11-3 lists device messages on Parameter Setting for MIMO Summary measurement function.

**Table 2.11-3 Device Messages On Parameter Setting For MIMO Summary**

| Function | Device Message |
|---|---|
| Active Antenna Threshold | :CALCulate:EVM:ANTenna:THReshold <rel_power> |
| | :CALCulate:EVM:ANTenna:THReshold? |
| Time Domain Extension | :CALCulate:EVM:TIME:EXTension OFF\|ON\|0\|1 |
| | :CALCulate:EVM:TIME:EXTension? |
| Time Domain Extension - Subframe Number | :CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer <integer> |
| | :CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer? |

## 2.11.1 MIMO Summary

### :CONFigure:MIMO

MIMO Summary

Function

This command selects the MIMO Summary function.

Command

```
:CONFigure:MIMO
```

Details

This command only selects the measurement function and does not start measurement.

Example of Use

To select the MIMO Summary function.

```
CONF:MIMO
```

### :INITiate:MIMO

MIMO Summary Initiate

Function

This command starts the MIMO Summary function.

Command

```
:INITiate:MIMO
```

Example of Use

To start the MIMO Summary function.

```
INIT:MIMO
```

## :FETCh:MIMO[n]?

MIMO Summary Query

### Function

This command queries the result of MIMO Summary measurement.

### Query

`:FETCh:MIMO[n]?`

### Response

See Table 2.11-2.

### Details

`−999.0` is returned when measurement is not performed or an error has occurred.

### Example of Use

To query the result of MIMO Summary message measurement.

```
FETC:MIMO?
```

## :READ:MIMO[n]?

MIMO Summary Query

Function

This command performs MIMO Summary measurement once (single measurement) with the current settings, and then queries the measured result.

Query

```
:READ:MIMO[n]?
```

Response

See Table 2.11-2.

Example of Use

To perform MIMO Summary measurement and queries the measured result.

```
READ:MIMO?
```

Related Command

This command functions the same as the following command.

```
:MEASure:MIMO[n]?
```

## :MEASure:MIMO[n]?

MIMO Summary Query

Function

This command performs MIMO Summary measurement once (single measurement) with the current settings, and then queries the measured result.

Query

```
:MEASure:MIMO[n]?
```

Response

See Table 2.11-2.

Example of Use

To perform MIMO Summary measurement and query the measurement result.

```
MEAS:MIMO?
```

Related Command

```
This command functions the same as the following command.
READ:MIMO[n]?
```

## 2.11.2 Active Antenna Threshold

### :CALCulate:EVM:ANTenna:THReshold <rel_power>

Active Antenna Threshold

Function

When in MIMO Summary mode, this command sets the threshold value for each port to judge Active/Inactive.

Command

```
:CALCulate:EVM:ANTenna:THReshold <rel_power>
```

Parameter

| | |
|---|---|
| <rel_power> | Threshold |
| Range | –100.0 to 0.0 |
| Default | –10.0 |
| Unit | dB |
| Suffix code | DB |

Example of Use

To set Threshold to –30.0 dB.

```
CALC:EVM:ANT:THR -30.0
```

### :CALCulate:EVM:ANTenna:THReshold?

Active Antenna Threshold Query

Function

When in MIMO Summary mode, this command queries the threshold value for each port to judge Active/Inactive.

Query

```
:CALCulate:EVM:ANTenna:THReshold?
```

Response

```
<rel_power>
```

Parameter

| | |
|---|---|
| <rel_power> | Threshold |
| Range | –100.0 to 0.0 |

Example of Use

To query the threshold value.

```
CALC:EVM:ANT:THR?
> -30.0
```

## 2.11.3 Time Domain Extension

### :CALCulate:EVM:TIME:EXTension OFF|ON|0|1

Time Domain Extension

**Function**

When in MIMO Summary mode, this command sets the Time Domain Extension measurement On/Off.

**Command**

```
:CALCulate:EVM:TIME:EXTension <switch>
```

**Parameter**

| | |
|---|---|
| `<switch>` | Time Domain Extension measurement On/Off |
| `OFF|0` | Off (Does not perform the Time Domain Extension measurement.) |
| `ON|1` | On (Performs the Time Domain Extension measurement.) |

**Details**

If this function is set to On, measurement results in MIMO Summary mode can be obtained in subframe units. Note that the Storage function cannot be used when this function is set to On.
If this function is set to On, "Time domain Extension Mode" is displayed in the measurement result screen of the MX269022A.

**Example of Use**

To set the Time Domain Extension measurement to On.

```
CALC:EVM:TIME:EXT ON
```

### :CALCulate:EVM:TIME:EXTension?

Time Domain Extension Query

**Function**

This command queries whether the Time Domain Extension measurement in MIMO Summary mode is set to On/Off.

**Query**

```
:CALCulate:EVM:TIME:EXTension?
```

**Response**

| | |
|---|---|
| `<switch>` | Time Domain Extension measurement On/Off |
| `0` | Off |
| `1` | On |

**Example of Use**

To query the setting of the Time Domain Extension measurement.

```
CALC:EVM:TIME:EXT?
> 1
```

## 2.11.4 Time Domain Extension - Subframe Number

:CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer <integer>

Time Domain Extension – Subframe Number

Function

If the Time Domain Extension measurement in MIMO Summary mode is set to On, this command sets the target subframe number of the measurement result query.

Command

```
:CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer <integer>
```

Parameter

| | |
|---|---|
| <integer> | Subframe number |
| Range | 0 to 199 |
| Resolution | 1 |
| Suffix code | None |
| Default | 0 |

Details

If the Time Domain Extension measurement in MIMO Summary mode is set to On, the target subframe number of the measurement result query can be specified by this command.

The measurement results of the target subframe can be queried using the following remote commands:

":FETCh:MIMO[n]?", ":READ:MIMO[n]?", ":MEASure:MIMO[n]?"

If the target subframe is specified by this function, the target subframe number of the measurement result query is displayed in the measurement result screen of the MX269022A.

Example of Use

To set 1 for the target subframe number of the measurement result query.

```
CALC:EVM:TIME:EXT:SUBF:NUMB 1
```

## :CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer?

Time Domain Extension – Subframe Number

### Function

If the Time Domain Extension measurement in MIMO Summary mode is set to On, this command queries the target subframe number of the measurement result query.

### Query

```
:CALCulate:EVM:TIME:EXTension:SUBFrame:NUMBer?
```

### Response

| | |
|---|---|
| `<integer>` | Subframe number |
| Range | 0 to 199 |
| Resolution | 1 |

### Example of Use

To query the target subframe number of the measurement result query.

```
CALC:EVM:TIME:EXT:SUBF:NUMB?
> 1
```

# 2.12 Replay Function

Table 2.12-1 lists device messages for setting the Replay function.

**Table 2.12-1 Device Messages for Replay Function**

| Function | Device Message |
|---|---|
| Stop Replay | :MMEMory:LOAD:IQData:STOP |
| Execute Replay | :MMEMory:LOAD:IQData <filename>,<device>,<application> |
| Replay File Information Query | :MMEMory:LOAD:IQData:INFormation? |
| Replay Execute Query | :MMEMory:LOAD:IQData:INFormation:STATe? |
| Replay Filename Query | :MMEMory:LOAD:IQData:INFormation:FILE? |
| Replay Device Query | :MMEMory:LOAD:IQData:INFormation:DEVice? |
| Replay Application Query | :MMEMory:LOAD:IQData:INFormation:APPLication? |
| Replay Level Over Query | :MMEMory:LOAD:IQData:INFormation:CONDition? |
| Replay Error Icon Query | :MMEMory:LOAD:IQData:INFormation:ERRor? |
| Replay Correction Query | :MMEMory:LOAD:IQData:INFormation:CORRection? |
| Replay External Reference Query | :MMEMory:LOAD:IQData:INFormation:ROSCillator? |

## :MMEMory:LOAD:IQData:STOP

Stop Replay

Function

This command stops the Replay function.

Command

`:MMEMory:LOAD:IQData:STOP`

Details

This command is available only when the Replay function is executed.

Example of Use

To stop the Replay function.

`MMEM:LOAD:IQD:STOP`

## :MMEMory:LOAD:IQData <filename>,<device>,<application>

Execute Replay

Function

This command executes the Replay function. Set a file, a drive, and an application to select the target IQ data.

Command

`:MMEMory:LOAD:IQData <filename>,<device>,<application>`

Parameter

| | |
|---|---|
| `<filename>` | Target file name<br>Character string within 32 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension)<br>The following characters cannot be used:<br>`\ / : * ? “ ” ‘ ’ < > \|` |
| `<device>` | Drive name<br>`A,B,D,E,F,...` |
| `<application>` | Application to load IQ data file |
| `LTETDDDL` | LTE TDD Downlink Measurement Software |
| `SIGANA` | Signal Analyzer |

Details

This command is not available when the Batch measurement function is executed.

Example of Use

To load the IQ data file named TEST in D drive and to execute the Replay function.

`MMEM:LOAD:IQD “TEST”,D,LTETDDDL`

## :MMEMory:LOAD:IQData:INFormation?

Replay File Information Query

**Function**

This command queries the information of the file for which the Replay function is executed.

**Query**

```
:MMEMory:LOAD:IQData:INFormation?
```

**Response**

```
<filename>,<time_length>
```

**Parameter**

| | |
|---|---|
| <filename> | File Name<br>Character string within 32 characters (excluding extension)<br>*** is returned when the Replay function is not executed. |
| <time_length> | Time length of analyzable IQ data |
| Resolution | 5 frame<br>No suffix code. Value is returned in frame units.<br>–999999999999 is returned when the Replay function is not executed. |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query the information of the file for which the Replay function is executed.

```
MMEM:LOAD:IQD:INF?
> TEST,38.838771500
```

## :MMEMory:LOAD:IQData:INFormation:STATe?

Replay Execute Query

**Function**

This command queries whether the Replay function is executed.

**Query**

`:MMEMory:LOAD:IQData:INFormation:STATe?`

**Response**

`<switch>`

**Parameter**

| | |
|---|---|
| `<switch>` | Replay On/Off |
| 1 | On |
| 0 | Off |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query whether the Replay function is executed.

```
MMEM:LOAD:IQD:INF:STAT?
> 1
```

## :MMEMory:LOAD:IQData:INFormation:FILE?

Replay Filename Query

**Function**

This command queries the name of the file for which the Replay function is executed.

**Query**

`:MMEMory:LOAD:IQData:INFormation:FILE?`

**Response**

`<filename>`

**Parameter**

| | |
|---|---|
| `<filename>` | File Name<br>Character string within 32 characters (excluding extension)<br>*** is returned when the Replay function is not executed. |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query the name of the file for which the Replay function is executed.

```
MMEM:LOAD:IQD:INF:FILE?
```

## :MMEMory:LOAD:IQData:INFormation:DEVice?

Replay Device Query

### Function

This command queries the name of the drive for which the Replay function is executed.

### Query

```
:MMEMory:LOAD:IQData:INFormation:DEVice?
```

### Response

`<device>`

### Parameter

| | |
|---|---|
| `<device>` | Drive name<br>`A,B,D,E,F,...`<br>*** is returned when the Replay function is not executed. |

### Details

This command is not available when the Batch measurement function is executed.

### Example of Use

To query the name of the drive for which the Replay function is executed.

```
MMEM:LOAD:IQD:INF:DEV?
```

## :MMEMory:LOAD:IQData:INFormation:APPLication?

Replay Application Query

**Function**

This command queries the name of the application for which the Replay function is executed.

**Query**

```
:MMEMory:LOAD:IQData:INFormation:APPLication?
```

**Response**

```
<application>
```

**Parameter**

| | |
|---|---|
| `<application>` | Application to load IQ data file |
| `LTETDDDL` | LTE TDD Downlink Measurement Software |
| | *** is returned when the Replay function is not executed. |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query the name of the application for which the Replay function is executed.

```
MMEM:LOAD:IQD:INF:APPL?
```

## :MMEMory:LOAD:IQData:INFormation:CONDition?

Replay Level Over Query

**Function**

This command queries whether Level Over is displayed while the Replay function is executed.

**Query**

```
:MMEMory:LOAD:IQData:INFormation:CONDition?
```

**Response**

<switch>

| | |
|---|---|
| 1 | Level Over is displayed |
| 0 | Normal |
| | –999.0 is returned when the Replay function is not executed. |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query whether Level Over is displayed while the Replay function is executed.

```
MMEM:LOAD:IQD:INF:COND?
> 0
```

## :MMEMory:LOAD:IQData:INFormation:ERRor?

Replay Error Icon Query

### Function

This command queries whether the Replay Error Info. icon is displayed while the Replay function is executed.

### Query

```
:MMEMory:LOAD:IQData:INFormation:ERRor?
```

### Response

<switch>

| | |
|---|---|
| 1 | Replay Error Info. icon is displayed. |
| 0 | Normal |
| | –999.0 is returned when the Replay function is not executed. |

### Details

The Replay Error Info. icon is displayed if the loaded xml file contains error information.
This command is not available when the Batch measurement function is executed.

### Example of Use

To query whether the Replay Error Info. icon is displayed while the Replay function is executed.

```
MMEM:LOAD:IQD:INF:ERR?
> 0
```

## :MMEMory:LOAD:IQData:INFormation:CORRection?

Replay Correction Query

**Function**

This function queries the Correction value while the Replay function is executed.

**Query**

```
:MMEMory:LOAD:IQData:INFormation:CORRection?
```

**Response**

```
<real>
```

**Parameter**

| | |
|---|---|
| `<real>` | Correction level |
| `Range` | –100 to +100 dB<br>0.000 is returned when Correction is Off.<br>–999.0 is returned when the Replay function is not executed. |

**Details**

This command is not available when the Batch measurement function is executed.

**Example of Use**

To query the Correction value while the Replay function is executed.

```
MMEM:LOAD:IQD:INF:CORR?
```

## :MMEMory:LOAD:IQData:INFormation:ROSCillator?

Replay External Reference Query

### Function

This command queries the frequency reference signal source when the Replay function is executed.

### Query

`:MMEMory:LOAD:IQData:INFormation:ROSCillator?`

### Response

`<source>`

### Parameter

| | |
|---|---|
| `<source>` | Frequency reference signal source |
| `INT` | Internal reference signal source |
| `INTU` | Internal reference signal source (Unlock state) |
| `EXT` | External reference signal source |
| `EXTU` | External reference signal source (Unlock state) |
| | *** is returned when the Replay function is not executed. |

### Details

This command is not available when the Batch measurement function is executed.

### Example of Use

To query the frequency reference signal source when the Replay function is executed.

```
MMEM:LOAD:IQD:INF:ROSC?
```

# Chapter 3 SCPI Status Register

This chapter explains the SCPI commands used to read the state of the application and the status register.

# 3.1 Reading Measurement Status

## :STATus:ERRor?

Measurement Status Error Query

Function

This command queries a measurement error.

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: $2^0 = 1$ | No measurement |
| bit1: $2^1 = 2$ | Level Over |
| 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 65535

Details

0 is returned at normal termination.

Usage Example

To query a measurement error.

```
STAT:ERR?
> 0
```

# 3.2 STATus:QUEStionable Register

The hierarchical structure of the QUEStionable Status register is described in Figures 3.2-1 and 3.2-2, and Tables 3.2-1 and 3.2-2.

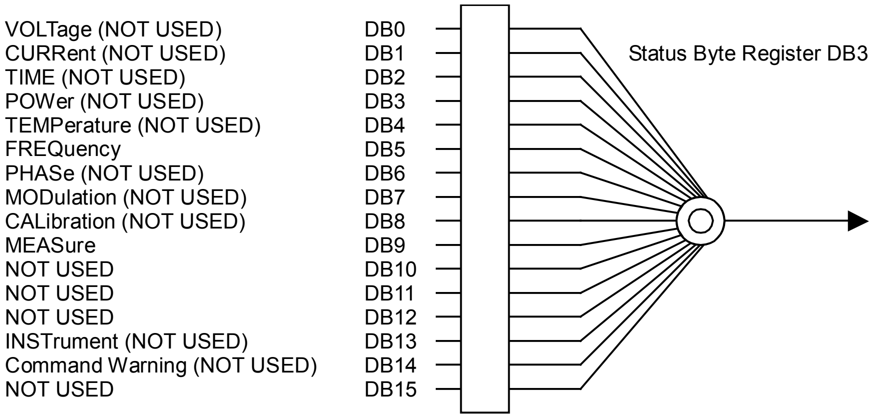


**Figure 3.2-1 QUEStionable Status Register**

**Table 3.2-1 Bit Definition of QUEStionable Status Register**

| Bit | Definition |
|---|---|
| DB5 | Reference Clock Unlock |
| DB9 | QUEStionable Measure Register Summary |

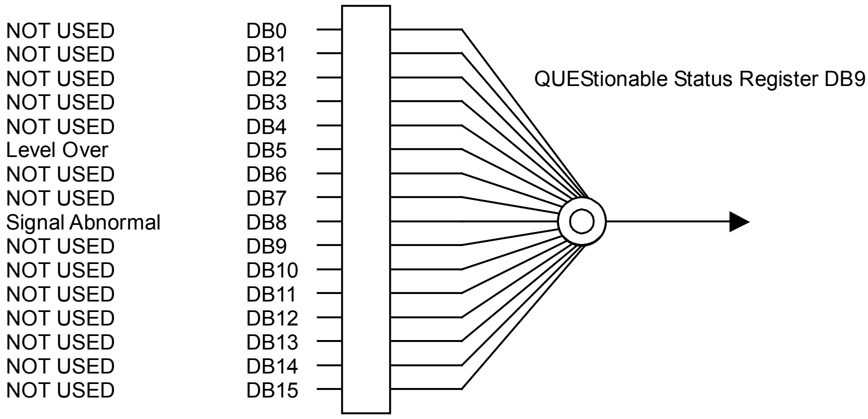


**Figure 3.2-2 QUEStionable Measure Register**

**Table 3.2-2 Bit Definition of QUEStionable Measure Register**

| Bit | Definition |
|---|---|
| DB5 | Level Over |
| DB8 | Signal Abnormal |

3

SCPI Status Register

Table 3.2-3 lists the device messages for the QUEStionable Status register.

**Table 3.2-3 Device Messages for QUEStionable Status Register**

| Function | Device Message |
|---|---|
| Questionable Status Register Event | :STATus:QUEStionable[:EVENt]? |
| Questionable Status Register Condition | :STATus:QUEStionable:CONDition? |
| Questionable Status Register Enable | :STATus:QUEStionable:ENABle <integer> |
| | :STATus:QUEStionable:ENABle? |
| Questionable Status Register Negative Transition | :STATus:QUEStionable:NTRansition <integer> |
| | :STATus:QUEStionable:NTRansition? |
| Questionable Status Register Positive Transition | :STATus:QUEStionable:PTRansition <integer> |
| | :STATus:QUEStionable:PTRansition? |
| Questionable Measure Register Event | :STATus:QUEStionable:MEASure[:EVENt]? |
| Questionable Measure Register Condition | :STATus:QUEStionable:MEASure:CONDition? |
| Questionable Measure Register Enable | :STATus:QUEStionable:MEASure:ENABle <integer> |
| | :STATus:QUEStionable:MEASure:ENABle? |
| Questionable Measure Register Negative Transition | :STATus:QUEStionable:MEASure:NTRansition <integer> |
| | :STATus:QUEStionable:MEASure:NTRansition? |
| Questionable Measure Register Positive Transition | :STATus:QUEStionable:MEASure:PTRansition <integer> |
| | :STATus:QUEStionable:MEASure:PTRansition? |

## :STATus:QUEStionable[:EVENt]?

Questionable Status Register Event

Function

This command queries Event register of QUEStionable Status register.

Query

`:STATus:QUEStionable[:EVENt]?`

Response

`<integer>`

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query event register of QUEStionable Status register.

```
STAT:QUES?
> 0
```

## :STATus:QUEStionable:CONDition?

Questionable Status Register Condition

Function

This command queries Condition register of QUEStionable Status register

Query

`:STATus:QUEStionable:CONDition?`

Response

`<integer>`

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Condition Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query Condition register of QUEStionable Status register.

```
STAT:QUES:COND?
> 0
```

## :STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function

This command sets Event Enable register of QUEStionable Status register.

Command

```
:STATus:QUEStionable:ENABle <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set value of Event Enable register of QUEStionable Status register to 16.

```
STAT:QUES:ENAB 16
```

## :STATus:QUEStionable:ENABle?

Questionable Status Register Enable Query

Function

This command queries Event Enable register of QUEStionable Status register.

Query

```
:STATus:QUEStionable:ENABle?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query Event Enable register of QUEStionable Status register.

```
STAT:QUES:ENAB?
> 16
```

## :STATus:QUEStionable:NTRansition <integer>

Questionable Status Register Negative Transition

Function

This command sets transition filter (Negative Transition) of QUEStionable Status register.

Command

```
:STATus:QUEStionable:NTRansition <integer>
```

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Transition Filter (Negative Transition) |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To set transition filter (Negative Transition) of QUEStionable Status register to 16.

```
STAT:QUES:NTR 16
```

## :STATus:QUEStionable:NTRansition?

Questionable Status Register Negative Transition Query

Function

This command queries transition filter (Negative Transition) of QUEStionable Status register.

Query

```
:STATus:QUEStionable:NTRansition?
```

Response

```
<integer>
```

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Transition Filter (Negative Transition) |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To query transition filter (Negative Transition) of QUEStionable Status register.

```
STAT:QUES:NTR?
> 16
```

## :STATus:QUEStionable:PTRansition <integer>

Questionable Status Register Positive Transition

Function

This command sets transition filter (Positive Transition) of QUEStionable Status register.

Command

```
:STATus:QUEStionable:PTRansition <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Positive Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set transition filter (Positive Transition) of QUEStionable Status register to 16.

```
STAT:QUES:PTR 16
```

## :STATus:QUEStionable:PTRansition?

Questionable Status Register Positive Transition Query

Function

This command queries transition filter (Positive Transition) of QUEStionable Status register.

Query

```
:STATus:QUEStionable:PTRansition?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Positive Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query transition filter (Positive Transition) of QUEStionable Status register.

```
STAT:QUES:PTR?
> 16
```

## :STATus:QUEStionable:MEASure[:EVENt]?

Questionable Measure Register Event

Function

This command queries Event register of QUEStionable Measure register.

Query

`:STATus:QUEStionable:MEASure[:EVENt]?`

Response

`<integer>`

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Event Register |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To query Event register of QUEStionable Measure register.

```
STAT:QUES:MEAS?
> 0
```

## :STATus:QUEStionable:MEASure:CONDition?

Questionable Measure Register Condition

Function

This command queries Condition register of QUEStionable Measure register.

Query

`:STATus:QUEStionable:MEASure:CONDition?`

Response

`<integer>`

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Condition Register |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To query Condition register of QUEStionable Measure register.

```
STAT:QUES:MEAS:COND?
> 0
```

## :STATus:QUEStionable:MEASure:ENABle <integer>

Questionable Measure Register Enable

Function

This command sets Event Enable register of QUEStionable Measure register.

Command

```
:STATus:QUEStionable:MEASure:ENABle <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set a value of Event Enable register of QUEStionable Measure register to 16.

```
STAT:QUES:MEAS:ENAB 16
```

## :STATus:QUEStionable:MEASure:ENABle?

Questionable Measure Register Enable Query

Function

This command queries Event Enable register of QUEStionable Measure register.

Query

```
:STATus:QUEStionable:MEASure:ENABle?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query Event Enable register of QUEStionable Measure register.

```
STAT:QUES:MEAS:ENAB?
> 16
```

## :STATus:QUEStionable:MEASure:NTRansition <integer>

Questionable Measure Register Negative Transition

Function

This command sets transition filter (Negative Transition) of QUEStionable Measure register.

Command

```
:STATus:QUEStionable:MEASure:NTRansition <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Negative Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set transition filter (Negative Transition) of QUEStionable Measure register to 16.

```
STAT:QUES:MEAS:NTR 16
```

## :STATus:QUEStionable:MEASure:NTRansition?

Questionable Measure Register Negative Transition Query

Function

This command queries transition filter (Negative Transition) of QUEStionable Measure register.

Query

```
:STATus:QUEStionable:MEASure:NTRansition?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Negative Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query transition filter (Negative Transition) of QUEStionable Measure register.

```
STAT:QUES:MEAS:NTR?
> 16
```

## :STATus:QUEStionable:MEASure:PTRansition <integer>

Questionable Measure Register Positive Transition

Function

This command sets transition filter (Positive Transition) of QUEStionable Measure register.

Command

```
:STATus:QUEStionable:MEASure:PTRansition <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Positive Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set transition filter (Positive Transition) of QUEStionable Measure register to 16.

```
STAT:QUES:MEAS:PTR 16
```

## :STATus:QUEStionable:MEASure:PTRansition?

Questionable Measure Register Positive Transition Query

Function

This command queries transition filter (Positive Transition) of QUEStionable Measure register.

Query

```
:STATus:QUEStionable:MEASure:PTRansition?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Positive Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query transition filter (Positive Transition) of QUEStionable Measure register.

```
STAT:QUES:MEAS:PTR?
> 16
```

# 3.3 STATus:OPERation Register

The hierarchical structure of the OPERation Status register is described in Figure 3.3-1 and Table 3.3-1.

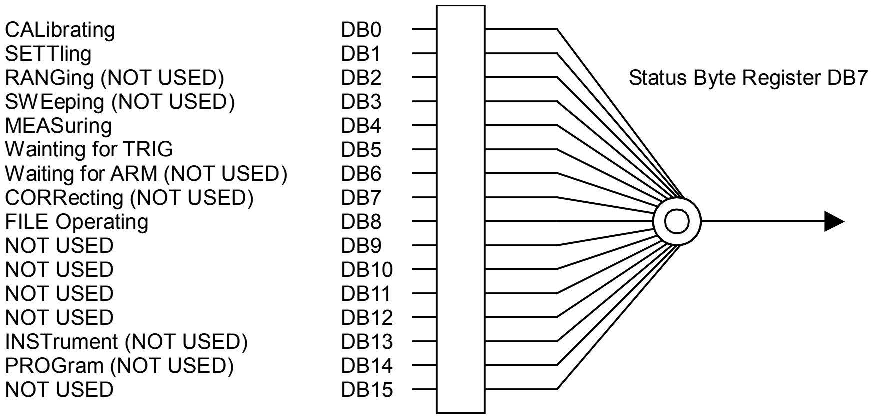


**Figure 3.3-1 OPERation Status Register**

**Table 3.3-1 Bit Definition for OPERation Status Register**

| Bit | Definition |
|---|---|
| DB0 | CAL Executed |
| DB1 | Warm-up displayed |
| DB4 | Capture executed (Always 1 at Continuous measurement) |
| DB5 | Waiting for trigger signal |
| DB8 | Operating on file |

Table 3.3-2 lists the device messages for the OPERation status register.

**Table 3.3-2 Device Messages for OPERation Status Register**

| Function | Device Message |
|---|---|
| Operation Status Register Event | `:STATus:OPERation[:EVENt]?` |
| Operation Status Register Condition | `:STATus:OPERation:CONDition?` |
| Operation Status Register Enable | `:STATus:OPERation:ENABle <integer>` |
| | `:STATus:OPERation:ENABle?` |
| Operation Status Register Negative Transition | `:STATus:OPERation:NTRansition <integer>` |
| | `:STATus:OPERation:NTRansition?` |
| Operation Status Register Positive Transition | `:STATus:OPERation:PTRansition <integer>` |
| | `:STATus:OPERation:PTRansition?` |

## :STATus:OPERation[:EVENt]?

Operation Status Register Event

Function

This command queries Event register of OPERation Status register.

Query

`:STATus:OPERation[:EVENt]?`

Response

`<integer>`

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query Event register of OPERation Status register.

```
STAT:OPER?
> 0
```

## :STATus:OPERation:CONDition?

Operation Status Register Condition

Function

This command queries Event register of OPERation Condition register.

Query

`:STATus:OPERation:CONDition?`

Response

`<integer>`

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Condition Register |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query Event register of OPERation Condition register.

```
STAT:OPER:COND?
> 0
```

## :STATus:OPERation:ENABle <integer>

Operation Status Register Enable

**Function**

This command sets Event Enable register of OPERation Status register.

**Command**

```
:STATus:OPERation:ENABle <integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

**Usage Example**

To set Event Enable register of OPERation Status register to 16.

```
STAT:OPER:ENAB 16
```

## :STATus:OPERation:ENABle?

Operation Status Register Enable Query

**Function**

This command queries Event Enable register of OPERation Status register.

**Query**

```
:STATus:OPERation:ENABle?
```

**Response**

```
<integer>
```

**Parameter**

| | |
|---|---|
| `<integer>` | Bit Sum Total of Event Enable Register |
| Resolution | 1 |
| Range | 0 to 65535 |

**Usage Example**

To query Event Enable register of OPERation Status register.

```
STAT:OPER:ENAB?
> 16
```

## :STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function

This command sets transition filter (Negative Transition) of OPERation Status register.

Command

```
:STATus:OPERation:NTRansition <integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Negative Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To set transition filter (Negative Transition) of OPERation Status register to 16.

```
STAT:OPER:NTR 16
```

## :STATus:OPERation:NTRansition?

Operation Status Register Negative Transition Query

Function

This command queries transition filter (Negative Transition) of OPERation Status register.

Query

```
:STATus:OPERation:NTRansition?
```

Response

```
<integer>
```

Parameter

| | |
|---|---|
| `<integer>` | Bit Sum Total of Transition Filter (Negative Transition) |
| Resolution | 1 |
| Range | 0 to 65535 |

Usage Example

To query transition filter (Negative Transition) of OPERation Status register.

```
STAT:OPER:NTR?
> 16
```

## :STATus:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function

This command sets transition filter (Positive Transition) of OPERation Status register.

Command

```
:STATus:OPERation:PTRansition <integer>
```

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Transition Filter (Positive Transition) |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To set transition filter (Positive Transition) of OPERation Status register to 16.

```
STAT:OPER:PTR 16
```

## :STATus:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function

This command queries transition filter (Positive Transition) of OPERation Status register.

Query

```
:STATus:OPERation:PTRansition?
```

Response

```
<integer>
```

Parameter

| | | |
|---|---|---|
| `<integer>` | | Bit Sum Total of Transition Filter (Positive Transition) |
| | Resolution | 1 |
| | Range | 0 to 65535 |

Usage Example

To query transition filter (Positive Transition) of OPERation Status register.

```
STAT:OPER:PTR?
> 16
```