MX269020A
LTE Downlink Measurement Software
Operation Manual
Remote Control

21st 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 MX269020A LTE 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-W3064AE-21.0

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

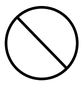
⚠ DANGER This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

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

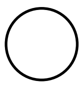
⚠ CAUTION This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

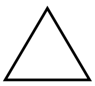
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



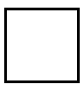
This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.



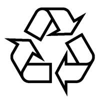
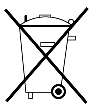
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



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.

MX269020A
LTE Downlink Measurement Software
Operation Manual Remote Control

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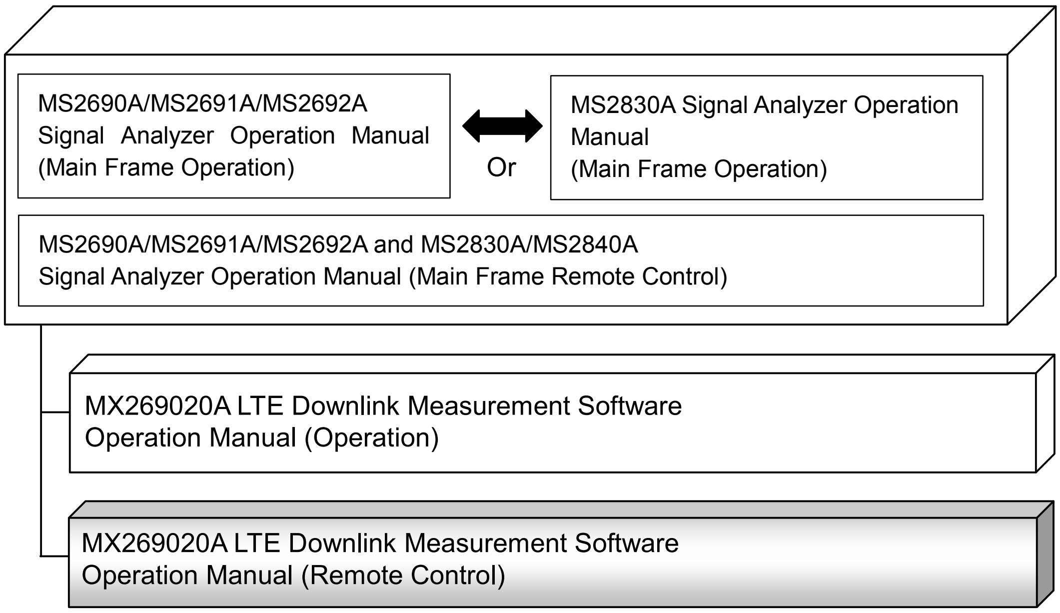
About This Manual

■ Composition of Operation Manuals

The operation manuals for MX269020A LTE 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.

- MX269020A LTE Downlink Measurement Software Operation Manual (Operation)

This manual describes operating methods of the MX269020A LTE Downlink Measurement Software.

- MX269020A LTE Downlink Measurement Software Operation Manual (Remote Control) <This document>

This manual describes remote control of the MX269020A LTE Downlink Measurement Software.

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Chapter 1 Outline

This chapter provides an overview of the remote control of the MX269020A LTE 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 MS269x Series and MS2830A Signal Analyzer (hereafter referred to as “this instrument”). 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 Option.

1.2 Basic Flow of Control

This part explains the basic remote control command programming for measuring a LTE 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).

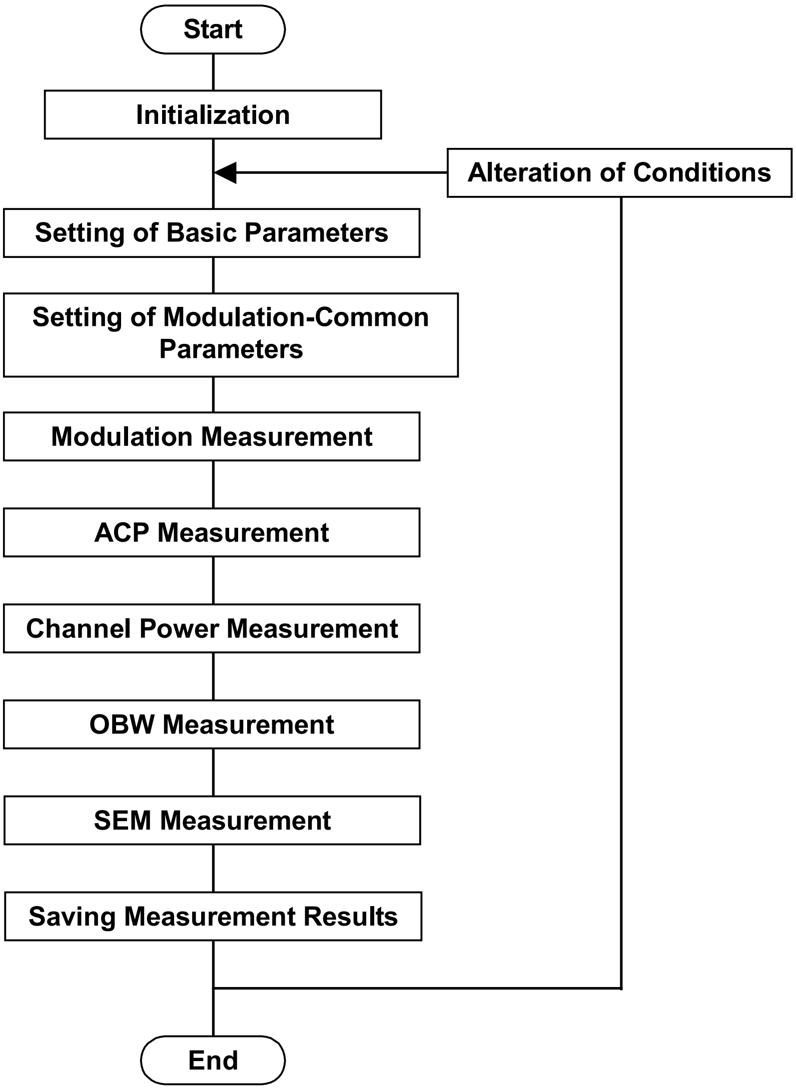


Figure 1.2-1 Flow of Basic Test

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

☞ 1.2.5 Batch Measurement

(6) 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.

☞ 1.2.6 ACP Measurement

☞ 1.2.7 Channel Power Measurement

☞ 1.2.8 OBW Measurement

☞ 1.2.9 SEM Measurement

(7) Saving Measurement Results

The measurement results obtained in this application are saved.

☞ 1.2.11 Saving Measurement Results

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.

Start

Initialization of Communication Interface

Setting Language Mode and Response Mode

```
INST CONFIG
SYST:LANG SCPI
SYST:RES:MODE A
```

Starting Application

```
SYST:APPL:LOAD 3GLTE_DL
SYST:APPL:LOAD SIGANA
SYST:APPL:LOAD SPECT
```

Selecting Application

```
INST 3GLTE_DL
```

Initialization

```
*RST
*CLS
```

Setting Measurement Mode

```
INIT:CONT OFF
```

End

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)

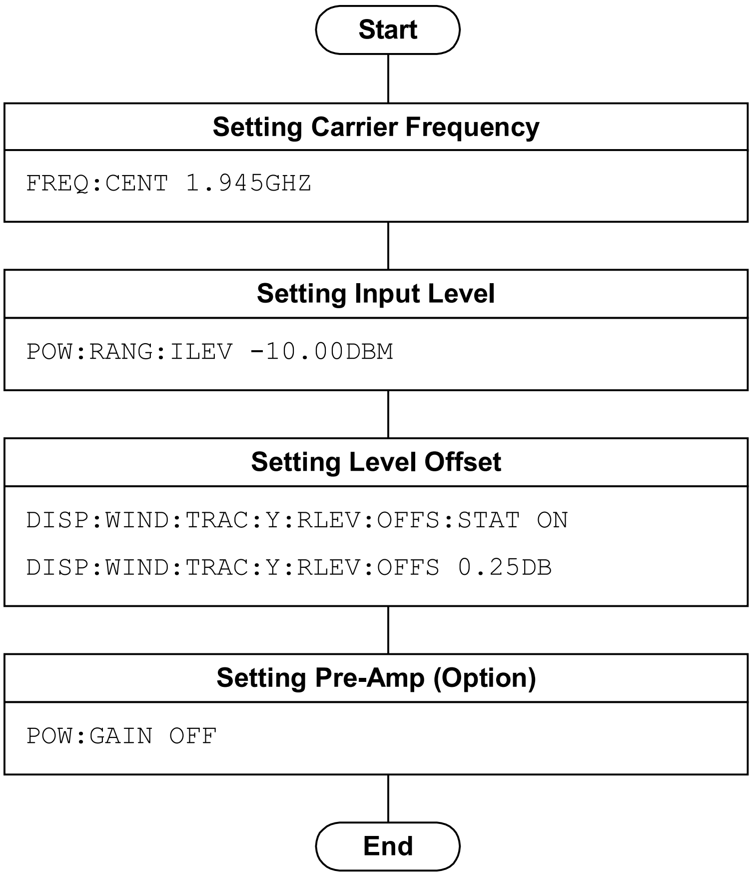
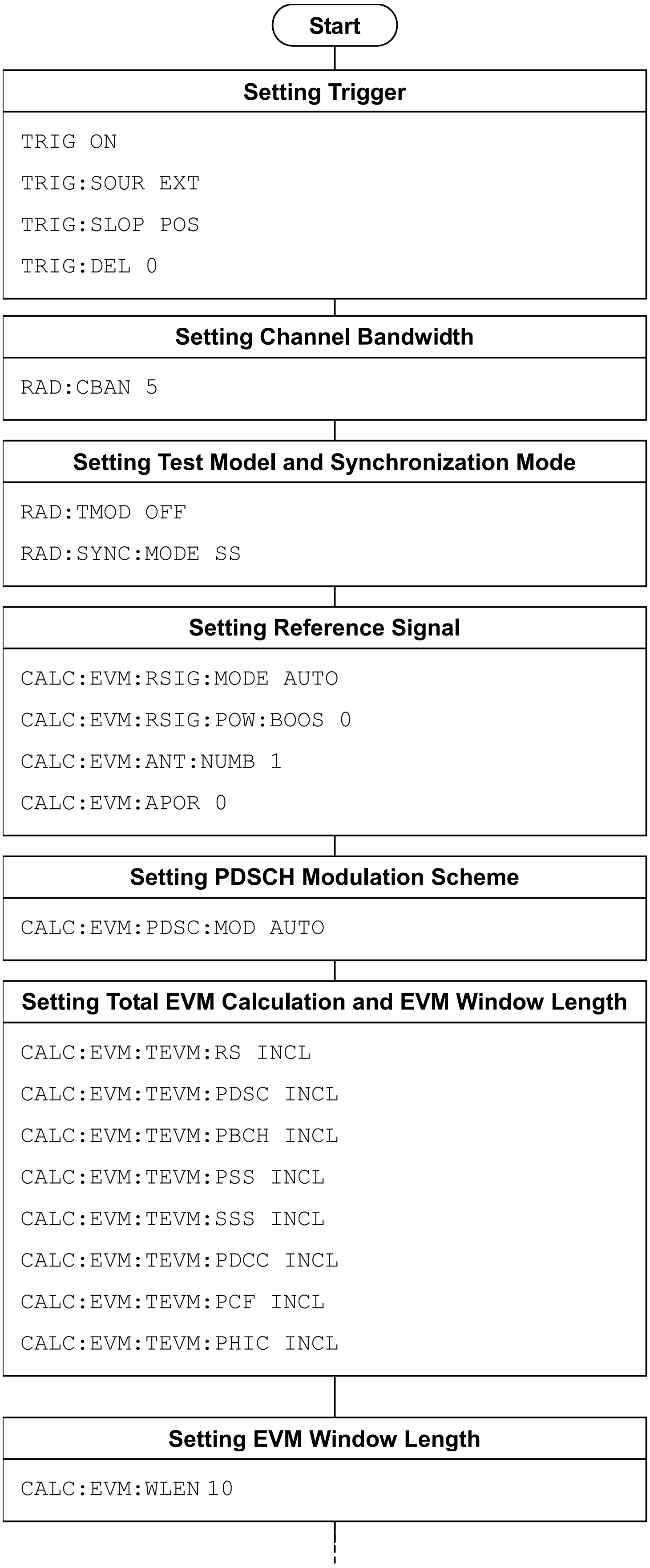


Figure 1.2.2-1 Flow of Basic Parameter Setting and Command Example

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) Synchronization Mode
(5) Reference Signal
  (a) Mode
  (b) Signal Load
  (c) Frequency Shift
  (d) Cell ID
  (e) Power Boosting
  (f) Number of Antenna
  (g) Antenna Port
(6) PDSCH Modulation Scheme
(7) Total EVM and Calculation Composite
(8) EVM Window Length
(9) PBCH/P-SS/PDCCH/PCFICH/PHICH/PDSCH
  (a) On/Off
  (b) Power Boosting Auto/Manual
  (c) Power Boosting Level
(10) PHICH Ng･Duration
(11) Number of PDCCH Symbols
(12) PDCCH Mapping/PDCCH Format/Number of PDCCHs
(13) Pseudo-Random Sequence
(14) Channel Estimation
(15) PDSCH EVM Calculation
(16) Virtual Resource Block Type
(17) Moving Average Filter


Start
Setting Trigger
TRIG ON
TRIG:SOUR EXT
TRIG:SLOP POS
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:MODE AUTO
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:TEVM:RS INCL
CALC:EVM:TEVM:PDSC INCL
CALC:EVM:TEVM:PBCH INCL
CALC:EVM:TEVM:PSS INCL
CALC:EVM:TEVM:SSS INCL
CALC:EVM:TEVM:PDCC INCL
CALC:EVM:TEVM:PCF INCL
CALC:EVM:TEVM:PHIC INCL
Setting EVM Window Length
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
CALC:EVM:PCF ON
CALC:EVM:PCF:POW:AUTO ON
CALC:EVM:PRS:STAN R8V830
```

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

  (d) Optional Measurements

(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) Scale

  (c) Marker

  (d) Constellation Display Range

Start

Selecting Measurement Function

```
CONF:EVM
```

Setting Measurement Parameters

```
EVM:CAPT:TIME:STAR 2
EVM:CAPT:TIME:LENG 2
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: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 Batch Measurement

The Batch measurement is executed in the following order:

(1) Selecting measurement function

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

  (a) Starting Subframe Number

  (b) Measurement Interval

  (c) Storage

(3) Measuring and reading results

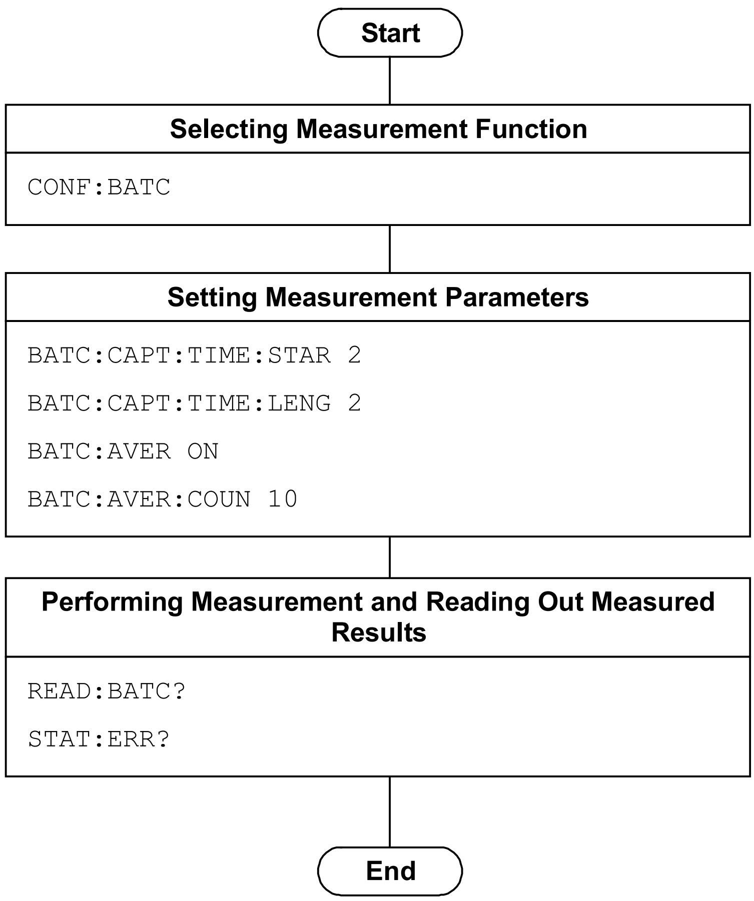


Figure 1.2.5-1 Flow of Batch Measurement and Command Example

1.2.6 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.

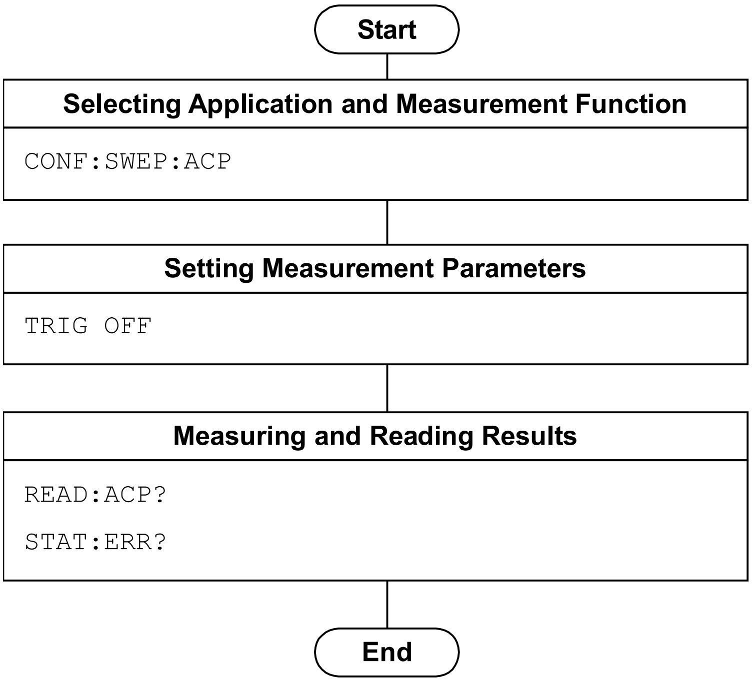


Figure 1.2.6-1 Flow of ACP Measurement using Spectrum Analyzer and Command Example

1.2.7 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.

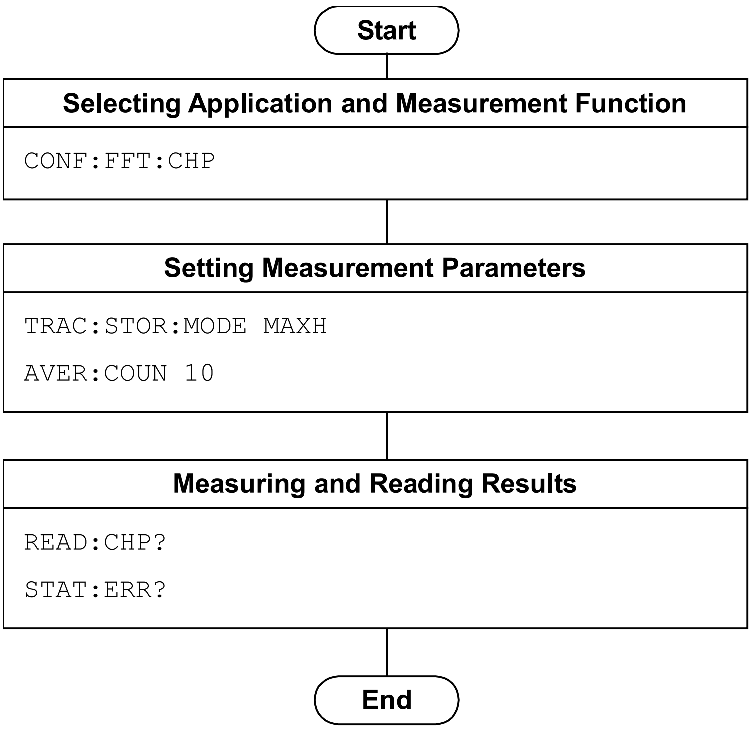


Figure 1.2.7-1 Flow of Channel Power Measurement using Signal Analyzer and Command Example

1.2.8 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.

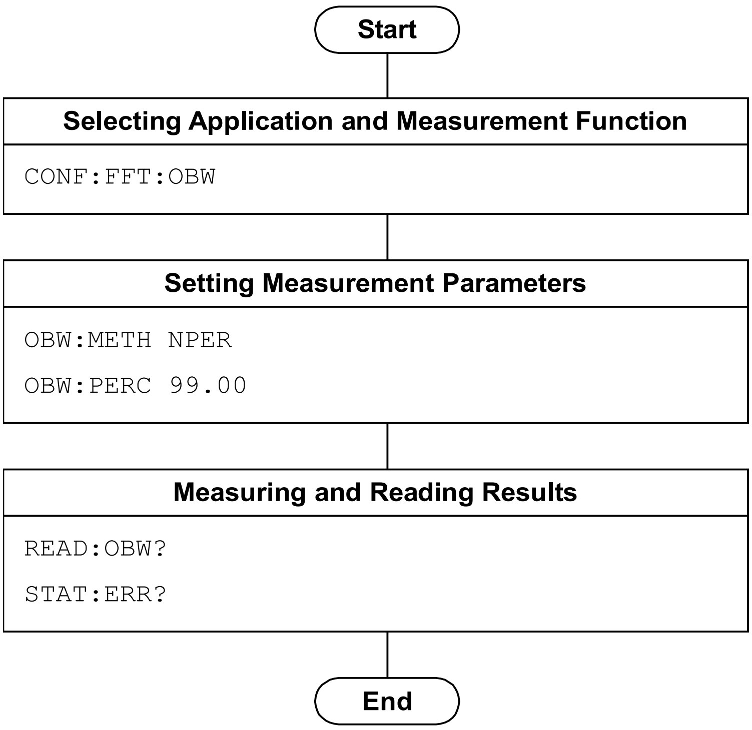


Figure 1.2.8-1 Flow of OBW Measurement using Signal Analyzer and Command Example

1.2.9 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.

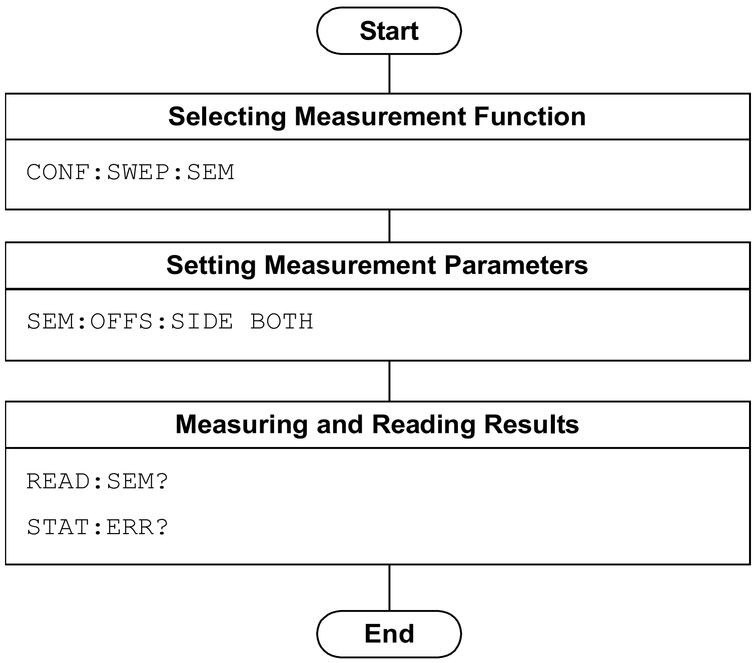


Figure 1.2.9-1 Flow of SEM Measurement using Spectrum Analyzer and Command Example

1.2.10 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 `CONFigure[: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. In addition, Spectrum Analyzer cannot be selected when the Replay function is executed.

Also, you can switch between Signal Analyzer and Spectrum Analyzer by using `CONFigure: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 `CONFigure:<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.

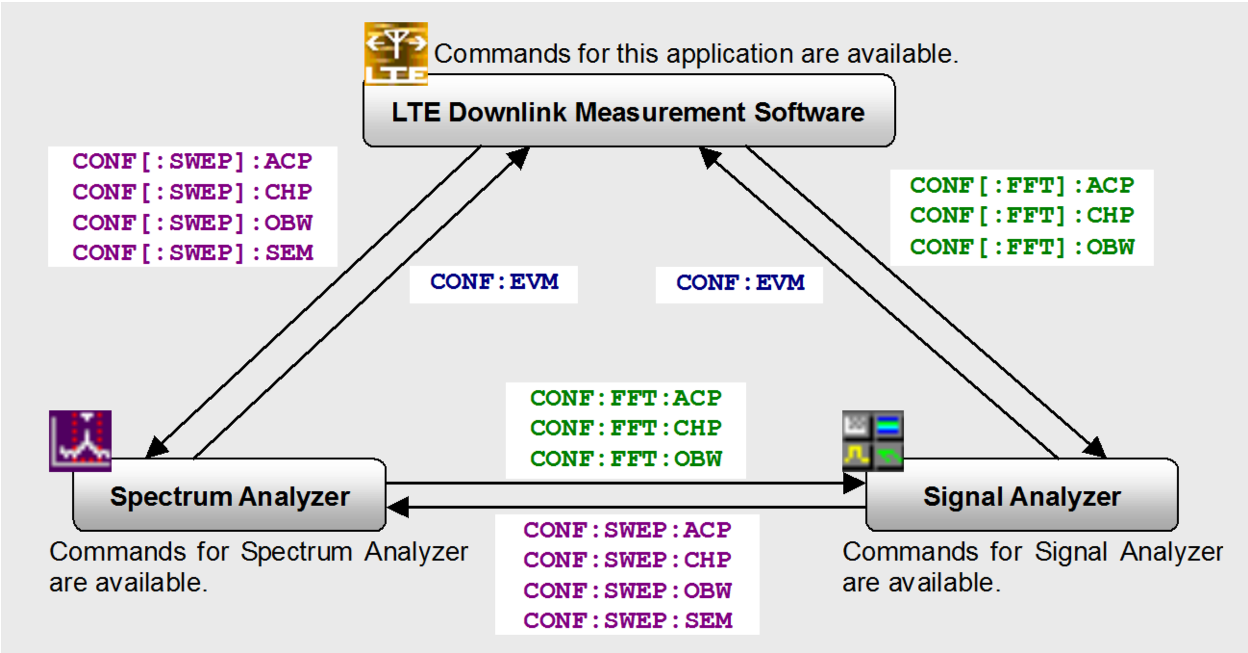


Figure 1.2.10-1 Switching of Measurement Functions among Applications

Figure 1.2.10-1 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 1.2.10-1 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.

1.2.11 Saving Measurement Results

The measurement results are saved in the following order:

(1) Selecting file format
Select either xml or csv for the saving file format.

(2) Saving measurement results
Specify the drive and file name of the save destination as necessary.
All measurement results of the MX269020A are saved.

Note:

When a file name is not specified, the saved file is output under the name format of "LTEDL*date_sequence number*.xml." When measurement results are saved several times on the same date, the sequence number starting from "00" is suffixed to each file name, like "LTEDL*date*_00.xml," "LTEDL*date*_01.xml," "LTEDL*date*_02.xml."

The sequence numbers suffixed to a file name are 00 to 99.
No more files can be saved when all numbers through 99 are used.

Files are saved to the following directory in the specified drive.

\Anritsu Corporation\Signal Analyzer\User Data\Measurement Results\3GLTE Downlink

Up to 1000 files can be saved in a folder.

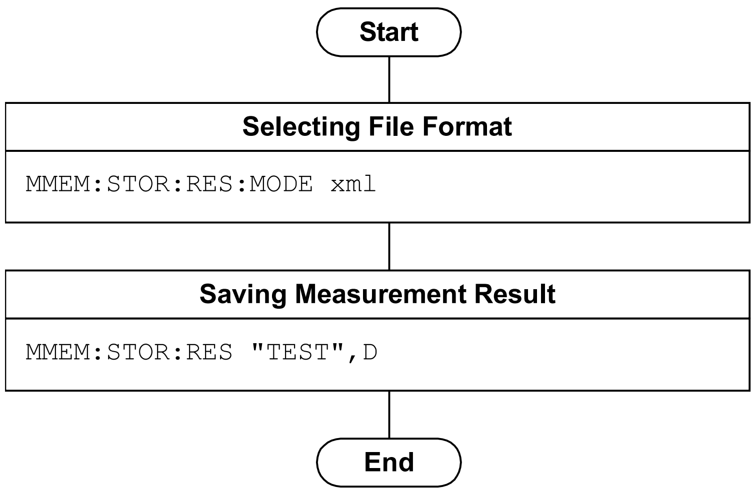


Figure 1.2.11-1 Saving Measurement Results Flow and Command Example

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.

On the Configuration screen, the Native mode is automatically set after transmitting command `SYST:LANG NAT`.

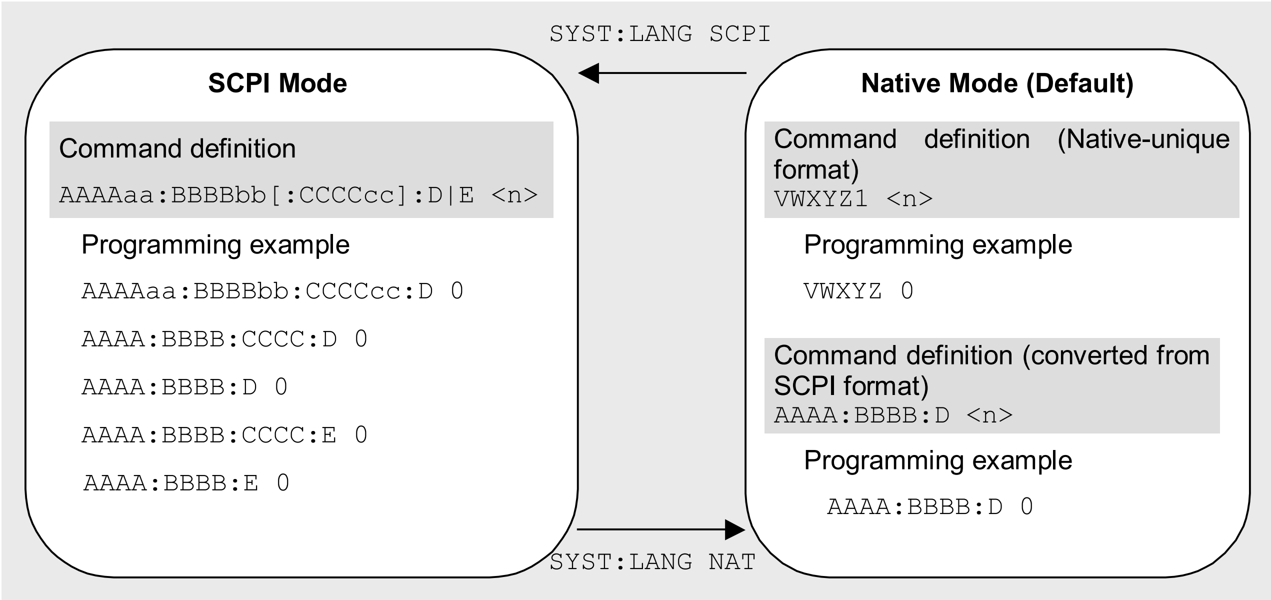


Figure 1.3-1 SCPI mode and Native mode

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 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 3GLTE_DL
Unload Application	:SYSTem:APPLication:UNLoad 3GLTE_DL
Application Switch	:INSTrument[:SELect] 3GLTE_DL|CONFIG
	:INSTrument[:SELect]?
Application Status	:INSTrument:SYSTem 3GLTE_DL,[ACTive]|INACtive|MINimum
	:INSTrument:SYSTem? 3GLTE_DL
Initialization	:INSTrument:DEFault
	:SYSTem:PRESet

2.1.1 Loading application

:SYSTem:APPLication:LOAD 3GLTE_DL

Load Application

Function

This command loads this application.

Command

```
:SYSTem:APPLication:LOAD 3GLTE_DL
```

Details

This function loads the installed application and registers it in the Application Switch menu.

Example of Use

To load this application.

```
SYST:APPL:LOAD 3GLTE_DL
```

:SYSTem:APPLication:UNLoad 3GLTE_DL

Unload Application

Function

This command exits this application.

Command

```
:SYSTem:APPLication:UNLoad 3GLTE_DL
```

Details

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

Example of Use

To exit this application.

```
SYST:APPL:UNL 3GLTE_DL
```

2.1.2 Selecting application

:INSTrument[:SELect] 3GLTE_DL|CONFIG

Application Switch

Function

This command selects the application to be controlled.

Command

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

Parameter

<apl_name>	Application name
3GLTE_DL	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 3GLTE_DL
```

: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
`3GLTE_DL`	This application
`SIGANA`	Signal Analyzer
`SPECT`	Spectrum Analyzer
`CONFIG`	Config

Details

`3GLTE_DL` 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?
> 3GLTE_DL
```

:INSTrument:SYSTem 3GLTE_DL,[ACTive]|INACtive|MINimum

Application Switch And Window Status

Function

This command selects the window status of this application.

Command

```
:INSTrument:SYSTem 3GLTE_DL,<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 3GLTE_DL,ACT
```

:INSTrument:SYSTem? 3GLTE_DL

Application Switch And Window Status Query

Function

This command queries the window status of this application.

Query

`:INSTrument:SYSTem? 3GLTE_DL`

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
`ACTive`	Active
`INACtive`	Inactive
`MINimum`	Minimized
`NON`	Not displayed

Example of Use

To query the window status of this application.

```
INST:SYST? 3GLTE_DL
> 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

<table>
<tr><th>Parameter</th><th>Device Message</th></tr>
<tr><td rowspan="2">Carrier Frequency</td><td>[:SENSe]:FREQuency:CENTer <freq></td></tr>
<tr><td>[:SENSe]:FREQuency:CENTer?</td></tr>
<tr><td rowspan="2">RF Spectrum</td><td>[:SENSe]:SPECtrum NORMal|REVerse</td></tr>
<tr><td>[:SENSe]:SPECtrum?</td></tr>
<tr><td rowspan="2">Input Level</td><td>[:SENSe]:POWer[:RF]:RANGe:ILEVel <real></td></tr>
<tr><td>[:SENSe]:POWer[:RF]:RANGe:ILEVel?</td></tr>
<tr><td rowspan="2">Reference Level (Remote only)</td><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real></td></tr>
<tr><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?</td></tr>
<tr><td rowspan="2">Level Offset</td><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power></td></tr>
<tr><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?</td></tr>
<tr><td rowspan="2">Level Offset State</td><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1</td></tr>
<tr><td>:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?</td></tr>
<tr><td rowspan="2">Pre-Amp State</td><td>[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:POWer[:RF]:GAIN[:STATe]?</td></tr>
<tr><td>Auto Range</td><td>[:SENSe]:POWer[:RF]:RANGe:AUTO ONCE</td></tr>
</table>

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	30 MHz to the upper limit of the main unit
Resolution	1 Hz
Suffix code	`HZ`, `KHZ`, `KZ`, `MHZ`, `MZ`, `GHZ`, `GZ` Hz is used when omitted.
Default	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	30 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?
> 6000000000
```

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SCPI Device Message Details

2.2.2 RF Spectrum

[:SENSe]:SPECtrum NORMal|REVerse

RF Spectrum

Function

This command sets whether to perform Spectrum Reverse.

Command

```
[:SENSe]:SPECtrum <mode>
```

Parameter

<mode>	Spectrum reverse
`NORMal`	Measures without IQ spectrum reverse. (Default)
`REVerse`	Measures with IQ spectrum reverse.

Example of Use

To enable the Spectrum Reverse function.

```
SPEC NORM
```

[:SENSe]:SPECtrum?

RF Spectrum Query

Function

This command queries the spectrum reverse function of the input signal spectrum.

Query

```
[:SENSe]:SPECtrum?
```

Response

```
<mode>
```

Parameter

`<mode>`	Spectrum reverse
`NORM`	Measures without IQ spectrum reverse.
`REV`	Measures with IQ spectrum reverse.

Example of Use

To query the spectrum reverse function setting.

```
SPEC?
> NORM
```

2.2.3 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) (–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp On)
Resolution	0.01 dB
Unit	1 dBm
Suffix code	`DBM` 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.

```
: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)
Resolution	0.01 dB Value is returned in dBm units.

Example of Use

To query the input level.

```
POW:RANG:ILEV?
> –15.00
```

2.2.4 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` dBm is used when omitted.
Default	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.

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
```

2.2.5 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 dB is used when omitted.
Default	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
```

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2.2.6 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
```

2.2.7 Pre Amp

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

Pre Amp

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.
- When the Replay function is executed.

Example of Use

To set Pre-amp On.

```
POW:GAIN ON
```

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

Pre Amp 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 008 is not installed, `0` (Pre-amp Off) is returned.

Example of Use

To query the Pre-amp On/Off state.

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

2.2.8 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.

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?
Synchronization Mode	[:SENSe]:RADio:SYNChronization:MODE RS|SS
	[:SENSe]:RADio:SYNChronization:MODE?
Reference Signal	:CALCulate:EVM:RSIGnal:MODE CELL|LOADfile|AUTO
	:CALCulate:EVM:RSIGnal:MODE?
	:CALCulate:EVM:RSIGnal:LOAD <filename>
	:CALCulate:EVM:RSIGnal:DEFault
	:CALCulate:EVM:RSIGnal?
	:CALCulate:EVM:RSIGnal:FSHift <integer>
	:CALCulate:EVM:RSIGnal:FSHift?
	:CALCulate:EVM:RSIGnal:CELLid <integer>
	:CALCulate:EVM:RSIGnal:CELLid?
	:CALCulate:EVM:RSIGnal:POWer:BOOSting <rel_power>
	:CALCulate:EVM:RSIGnal:POWer:BOOSting?
	:CALCulate:EVM:RSIGnal:DEVice <device>
	:CALCulate:EVM:RSIGnal:DEVice?
	: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?
Analysis Frame Position	[:SENSe]:EVM:CAPTure:TIME:FPOSition <integer>
	[:SENSe]:EVM:CAPTure:TIME:FPOSition?

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

Parameter	Device Message
Analysis Offset Time	[:SENSe]:EVM:CAPTure:TIME:OFFSet <time>
	[: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?
PBCH and Synchronization Signal Presence	:CALCulate:EVM:PBCH:PRESence OFF|ON|PBCH|SS|0|1|2|3
	:CALCulate:EVM:PBCH:PRESence?
Pseudo-Random Sequence	:CALCulate:EVM:PRS:STANdard R8V820| R8V830
	:CALCulate:EVM:PRS:STANdard?
Channel Estimation	:CALCulate:EVM:CHANnel:ESTimation OFF|ON|0|1
	:CALCulate:EVM:CHANnel:ESTimation?
Moving Average Filter	[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth <integer>
	[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth?
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 Boosting 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:NUMBer <mode>
	:CALCulate:EVM:PDCCh:SYMBol:NUMBer?
PDCCH Mapping	:CALCulate:EVM:PDCCh:MAPPing AUTO|FULL|EASY|FILE
	:CALCulate:EVM:PDCCh:MAPPing?
PDCCH Format	:CALCulate:EVM:PDCCh:MAPPing:EASY:FORMat <mode>
	:CALCulate:EVM:PDCCh:MAPPing:EASY:FORMat?
Number of PDCCHs	:CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer <integer>
	:CALCulate:EVM:PDCCh:MAPPing:EASY:NUMBer?
PDCCH Mapping Load Device	:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice <device>
	:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice?
PDCCH Mapping Load	:CALCulate:EVM:PDCCh:MAPPing:FILE:LOAD <filename>
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?
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?

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

Parameter	Device Message
Total EVM & Constellation Composite Calculation	: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?
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?
Virtual Resource Block Type	:CALCulate:EVM:VRBType LOCalized|DISTributed
	:CALCulate:EVM:VRBType?
Optional Measurements	:CALCulate:EVM:OPTional ON|OFF|1|0
	:CALCulate:EVM:OPTional?
Cyclic Prefix Mode	:CALCulate:EVM:CP:MODE <mode>
	:CALCulate:EVM:CP:MODE?
Timing Offset Reference	:CALCulate:EVM:TIME:OFFSet <mode>
	:CALCulate:EVM:TIME:OFFSet?

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`	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 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
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 Synchronization Mode

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

Synchronization Mode

Function

This command sets the synchronized signal.

Command

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

Parameter

<mode>	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 Test Model is set to Off.

Example of Use

To set Reference Signal to the synchronized 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>`	Synchronized signal
`RS`	Sets Reference Signal for the synchronized signal.
`SS`	Sets Synchronization Signal for the synchronized signal.

Example of Use

To query the synchronized signal.

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

2.3.4 Reference Signal

:CALCulate:EVM:RSIGnal:MODE LOADfile|CELL|AUTO

Reference Signal Mode

Function

This command sets the mode of the reference signal.

Command

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

Parameter

`<mode>`	Reference Signal
`LOADfile`	Reference Signal is determined in accordance with the external file.
`CELL`	Reference Signal is determined in accordance with the setting of the cell ID.
`AUTO`	Reference Signal is determined through automatic judgment. (Default)

Details

Auto can be selected only when Synchronization Mode is set to Synchronization Signal.

Also, when Auto is set, the synchronization signals (P-SS and S-SS) that are specified as the measurement target by Synchronization Signal in Detail Settings are included.

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

Example of Use

To set Auto for the mode of the reference signal.

```
CALC:EVM:RSIG:MODE AUTO
```

:CALCulate:EVM:RSIGnal:MODE?

Reference Signal Mode Query

Function

This command queries the mode of the reference signal.

Query

`:CALCulate:EVM:RSIGnal:MODE?`

Response

`<mode>`

Parameter

`<mode>`	Reference Signal
`LOADfile`	Reference Signal is determined in accordance with the external file.
`CELL`	Reference Signal is determined in accordance with the setting of the cell ID.
`AUTO`	Reference Signal is determined through automatic judgment.

Example of Use

To query the mode of the reference signal.

```
CALC:EVM:RSIG:MODE?
> AUTO
```

:CALCulate:EVM:RSIGnal:DEVice <device>

Reference Signal Load Device

Function

This command sets a name of the drive that stores the reference signal definition file.

Command

```
:CALCulate:EVM:RSIGnal:DEVice <device>
```

Parameter

`<device>`	Drive name
`D`	Sets the drive name to D (Default).
`A,B,E to Z`	Sets the drive name to the specified name.

Example of Use

To set a name of the drive that stores the reference signal definition file to D.

```
CALC:EVM:RSIG:DEV D
```

:CALCulate:EVM:RSIGnal:DEVice?

Reference Signal Load Device Query

Function

This command queries the name of the drive that stores the reference signal definition file.

Query

```
:CALCulate:EVM:RSIGnal:DEVice?
```

Response

```
<device>
```

Parameter

`<device>`	Drive name
`D`	Drive D
`A,B,E to Z`	Corresponding drive name

Details

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

Example of Use

To query the name of the drive that stores the reference signal definition file.

```
CALC:EVM:RSIG:DEV?
> D
```

:CALCulate:EVM:RSIGnal:LOAD <filename>

Reference Signal Load File

Function

This command sets a name for the reference signal definition file.

Command

```
:CALCulate:EVM:RSIGnal:LOAD <filename>
```

Parameter

`<filename>`	File name (Character string within 32 characters, enclosed in double quotations (" ") or single quotations (' '))

Details

A file with more than 33 characters cannot be used.
This command is available when Test Model is set to Off.

Example of Use

To set the reference signal definition file name to test.

```
CALC:EVM:RSIG:LOAD "test"
```

:CALCulate:EVM:RSIGnal:DEFault

Reference Signal Load Default

Function

This command restores the default reference signal.

Command

```
:CALCulate:EVM:RSIGnal:DEFault
```

Details

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

Example of Use

To restore the default reference signal.

```
CALC:EVM:RSIG:DEF
```

:CALCulate:EVM:RSIGnal?

Reference Signal Load Query

Function

This command queries the set reference signal.

Query

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

Response

```
<string>
```

Parameter

<string>	File name (character string within 32 characters) DEF is returned when the default reference signal is set.

Example of Use

To query the set reference signal.

```
CALC:EVM:RSIG?
> DEF
```

:CALCulate:EVM:RSIGnal:FSHift <integer>

Reference Signal Frequency Shift

Function

This command sets the frequency shift. This parameter is valid when Reference Signal Mode is set to Load File.

Command

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

Parameter

`<integer>`		Frequency shift
	Range	0 to 5
	Resolution	1
	Suffix codes	None
	Default	0

Example of Use

To set the frequency shift to 2.

```
CALC:EVM:RSIG:FSH 2
```

:CALCulate:EVM:RSIGnal:FSHift?

Reference Signal Frequency Shift Query

Function

This command queries the frequency shift.

Query

```
:CALCulate:EVM:RSIGnal:FSHift?
```

Response

```
<integer>
```

Parameter

`<integer>`		`Frequency shift`
	Range	0 to 5
	Resolution	1

Example of Use

To query the frequency shift.

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

:CALCulate:EVM:RSIGnal:CELLid <integer>

Reference Signal Cell ID

Function

This command sets the Cell ID. This parameter is valid when Reference Signal Mode is set to Using Cell ID or Loa File.

Command

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

Parameter

`<integer>`	CELL ID
Range	0 to 503
Resolution	1
Suffix code	None
Default	0

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>

Power Boosting

Function

This command sets the boost level of the reference signal.

Command

```
:CALCulate:EVM: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` dB is used when omitted.
Default	0 dB

Details

This command is available when Test Model 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?

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 reference signal
Range	–20.000 to +20.000 dB
Resolution	0.001 dB

Details

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

Example of Use

To query the boost level of the reference signal.

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

: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.
2	Uses 2 antennas for transmission.
4	Uses 4 antennas for transmission.

Details

This command is available when Test Model 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	0

Details

This command is available when Test Model 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
```

2.3.5 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	0 to 9
Resolution	1
Suffix code	None
Default	0

Example of Use

To set the analysis start position to Subframe number 2.

```
EVM:CAPT:TIME:STAR 2
```

[: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	0 to 9
Resolution	1

Example of Use

To query the analysis start time.

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

2.3.6 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 (10 – Starting Subframe Number)
Resolution	1
Suffix code	None
Default	1

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 (10 – Starting Subframe Number)
Resolution	1

Example of Use

To query the analysis subframe length.

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

2.3.7 Analysis Frame Position

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

Analysis Frame Position

Function

This command specifies the frame number from which to start analysis.

Command

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

Parameter

`<integer>`	Analysis start frame number
Range	0 to 199
Resolution	1
Suffix code	None
Default	0

Details

This command is available when Capture Time Auto is set to OFF.

The setting range depends on the settings of Capture Time Length and Storage Count. For details, refer to the MX269020A LTE Downlink Measurement Software Operation Manual Operation.

Example of Use

To set the analysis start time to 2.

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

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

Analysis Frame Position Query

Function

This command queries the frame number from which to start analysis.

Query

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

Response

```
<integer>
```

Parameter

`<integer>`	Analysis start frame number
Range	0 to 199
Resolution	1

Example of Use

To query the analysis start time.

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

2.3.8 Analysis Offset Time

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

Analysis Offset Time

Function

This command specifies the position from which to start analysis as an offset from the position specified by Analysis Frame Position.

Command

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

Parameter

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

Details

This command is available when Capture Time Auto is set to Off.

The setting depends on the settings of Capture Time Length, Storage Count, and Analysis Frame Position. For details, refer to the MX269020A LTE Downlink Measurement Software Operation Manual Operation.

Example of Use

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

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

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

Analysis Frame Position Query

Function

This command queries the start analysis position offset.

Query

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

Response

`<time>`

Parameter

`<time>`	Offset value
Range	–4.999999 to 4.999999 ms
Resolution	1 ns
	Value is returned in ns units.

Example of Use

To query the start analysis position offset.

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

2.3.9 PDSCH Modulation Scheme

:CALCulate:EVM:PDSCh:MODulation QPSK|16Qam|64Qam|256Qam|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 Model 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
```

2.3.10 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	128 Ts

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>`	FFT 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: 5)
When Channel Bandwidth is 3 MHz: 0 to 17 (Default: 12)
When Channel Bandwidth is 5 MHz: 0 to 35 (Default: 32)
When Channel Bandwidth is 10 MHz: 0 to 71 (Default: 66)
When Channel Bandwidth is 15 MHz: 0 to 106 (Default: 102)
When Channel Bandwidth is 20 MHz: 0 to 142 (Default: 136)

Resolution	1
Suffix code	None
Default	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?

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

Range
- 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
```

2.3.11 PBCH and Synchronization Signal Presence

:CALCulate:EVM:PBCH:PRESence OFF|ON|PBCH|SS|0|1|2|3

PBCH and Synchronization Signal Presence

Function

This command sets whether to include PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal to the measurement target.

Command

```
:CALCulate:EVM:PBCH:PRESence <switch>
```

Parameter

`<switch>`	Inclusion/exclusion of PBCH and Synchronization Signal
`OFF|0`	Excludes PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal from the measurement target.
`ON|1`	Includes PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal to the measurement target (Default).
`PBCH|2`	Includes PBCH to the measurement target.
`SS|3`	Includes Primary Synchronization Signal and Secondary Synchronization Signal to the measurement target.

Details

The settings of P-SS and S-SS cannot be changed when Synchronization Mode is set to Synchronization Signal.

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

Example of Use

To include PBCH and Synchronization Signal to the measurement target.

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

:CALCulate:EVM:PBCH:PRESence?

PBCH and Synchronization Signal Presence Query

Function

This command queries whether PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal are included in the measurement target.

Query

```
:CALCulate:EVM:PBCH:PRESence?
```

Response

```
<switch>
```

Parameter

`<switch>`	Inclusion/exclusion of PBCH and Synchronization Signal
0	PBCH, Primary Synchronization Signal, and Synchronization Signal are excluded from the measurement target.
1	PBCH, Primary Synchronization Signal, and Synchronization Signal are included in the measurement target.
2	PBCH is included in the measurement target.
3	Primary Synchronization Signal and Secondary Synchronization Signal are included in the measurement target.

Example of Use

To query whether PBCH and Synchronization Signal are included in the measurement target.

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

2.3.12 Pseudo-random sequence

:CALCulate:EVM:PRS:STANdard R8V820|R8V830

Pseudo-Random Sequence

Function

This command sets the 3GPP specifications to which the pseudo-random sequence should conform.

Command

```
:CALCulate:EVM:PRS:STANdard <mode>
```

Parameter

`<mode>`	Pseudo-random sequence generation
`R8V820`	Conforms to March 2008 version (3GPP R8 TS 36.211 v8.2.0)
`R8V830`	Conforms to May 2008 version (3GPP R8 TS 36.211 v8.3.0)

Details

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

Example of Use

To set the March version to which the pseudo-random sequence should conform.

```
CALC:EVM:PRS:STAN R8V820
```

:CALCulate:EVM:PRS:STANdard?

Pseudo-random sequence Query

Function

This command queries the 3GPP specifications to which the pseudo-random sequence conforms.

Query

```
:CALCulate:EVM:PRS:STANdard?
```

Response

```
<mode>
```

Parameter

`<mode>`	Pseudo-Random Sequence
`R8V820`	Conforms to March 2008 version (3GPP R8 TS 36.211 v8.2.0)
`R8V830`	Conforms to May 2008 version (3GPP R8 TS 36.211 v8.3.0)

Example of Use

To query the 3GPP specifications to which the pseudo-random sequence conforms.

```
CALC:EVM:PRS:STAN?
> R8V820
```

2.3.13 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

2.3.14 Moving Average Filter

[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth <integer>

Moving Average Filter

Function

This command sets the size of the moving average filter in RSs.

Command

```
[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth <integer>
```

Parameter

`<integer>`		Number of RS
	Range	1 to 71
	Resolution	2 (Odd number only)
	Suffix code	None
	Default	19

Details

This is available when Channel Estimation is set to On.

Example of Use

To set Moving Average Filter to 21.

```
EVM:EQU:TRA:MAF:LENG 21
```

[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth?

Moving Average Filter Query

Function

This command queries the size of the moving average filter in RSs.

Query

```
[:SENSe]:EVM:EQUalizer:TRAining:MAFilter:LENGth?
```

Response

```
<integer>
```

Parameter

`<integer>`		Number of RS
	Range	1 to 71
	Resolution	2 (Odd number only)

Example of Use

To query Moving Average Filter.

```
EVM: EQU:TRA:MAF:LENG?
> 21
```

2.3.15 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`	Use this when 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>	Filter type
NORM	For measuring single carrier signal.
NARR	For measuring multi-carrier signal.

Example of Use

To query the Measurement Filter Type

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

2.3.16 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
```

2.3.17 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.

```
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 command is not available when PBCH is set to Off.

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

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when PBCH is set to Off.

This command is available when Test Model 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?
> 10.00
```

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

Example of Use

To configure a setting to include Primary Synchronization Signal.

```
CALC:EVM:PBCH 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

Details

This command is not available when Primary Synchronization Signal is set to Off.

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

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 whether automatic detection of primary synchronization signal power within the measurement target is enabled.

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when Primary Synchronization Signal is set to Off.

This command is available when Test Model 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
```

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

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

Details

This command is not available when Secondary Synchronization Signal is set to Off.

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

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 whether automatic detection of secondary synchronization signal power within the measurement target is enabled.

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when Secondary Synchronization Signal is set to Off.

This command is available when Test Model 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?
> 10.00
```

2.3.20 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 command is not available when PDCCH is set to Off.

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

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when PDCCH is set to Off or when PDCCH Power Boosting is set to Auto.

This command is available when Test Model 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 not available when PCFICH or PDCCH is set to Off.

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

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:NUMBer <mode>

Number of PDCCH Symbol

Function

This command sets the number of symbols for PDCCH.

Command

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

Parameter

`<mode>`	Number of symbols
Range	When Channel Bandwidth is set to 1.4 MHz: 0 to 4 When Channel Bandwidth is set to other than 1.4 MHz: 0 to 3
Resolution	1
Suffix code	None
Default	1

Details

This command is not available when PDCCH is set to Off or when Number of PDCCH Symbols is set to Auto.

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

Example of Use

To set 1 as 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

```
<mode>
```

Parameter

`<mode>`	Number of symbols
Range	When Channel Bandwidth is set to 1.4 MHz: 0 to 4 When Channel Bandwidth is set to other than 1.4 MHz: 0 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|FULL|EASY|FILE

PDCCH Mapping

Function

This command sets the PDCCH mapping specification method.

Command

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

Parameter

<mode>	PDCCH Mapping specification method
AUTO	Auto detection
FULL	Performs measurement assuming all resource elements as PDCCH.
EASY	Performs measurement according to the specified PDCCH format and the number of PDCCHs.
FILE	Performs measurement according to the settings in the specified file.

Details

This command is not available when PDCCH is set to Off.

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

Example of Use

To perform measurement assuming all resource elements as PDCCH.

```
CALC:EVM:PDCC:MAPP FULL
```

: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`	Auto detection
`FULL`	Performs measurement assuming all resource elements as PDCCH.
`EASY`	Performs measurement according to the specified PDCCH format and the number of PDCCHs.
`FILE`	Performs measurement according to the settings in the specified file.

Example of Use

To query the PDCCH mapping specification method.

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

: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 command is not available if PDCCH is set to Off or if PDCCH Mapping is set to other than Easy.

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

Example of Use

To set the PDCCH format to 1.

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

Details

This command is not available if PDCCH is set to Off or if PDCCH Mapping is set to other than Easy.

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

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
```

:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice <device>

PDCCH Mapping Load Device

Function

This command specifies a drive from which a file that defines PDCCH mapping is to be loaded.

Command

```
:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice <device>
```

Parameter

`<device>`	Drive name
`D`	D is set for a drive name. (Default)
`A,B,E to Z`	Specifies the drive name.

Details

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

Example of Use

To load a file that defines PDCCH mapping from drive D.

```
CALC:EVM:PDCC:MAPP:FILE:DEV D
```

:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice?

PDCCH Mapping Load Device Query

Function

This command queries the drive storing the file that defines PDCCH mapping.

Query

```
:CALCulate:EVM:PDCCh:MAPPing:FILE:DEVice?
```

Response

```
<device>
```

Parameter

`<device>`	Drive name
`D`	D drive is set.
`A,B,E to Z`	Set drive name

Example of Use

To query the drive storing the file that defines PDCCH mapping.

```
CALC:EVM:PDCC:MAPP:FILE:DEV?
> D
```

:CALCulate:EVM:PDCCh:MAPPing:FILE:LOAD <filename>

PDCCH Mapping Load

Function

This command sets the file that defines the PDCCH Mapping.

Command

```
:CALCulate:EVM:PDCCh:MAPPing:FILE:LOAD <filename>
```

Parameter

`<filename>`	Character string within 32 characters enclosed by double quotes (“ ”) or single quotes (‘ ’)

Details

A file name with 33 or more characters cannot be set.

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

Example of Use

To set “test” as the file name.

```
CALC:EVM:PDCC:MAPP:FILE:LOAD "test"
```

2.3.21 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

Details

This command is not available when PCFICH is set to Off.

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

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when PCFICH is set to Off.

This command is available when Test Model 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?
> 10.00
```

2.3.22 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 not available when PHICH is set to Off.

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

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` dB is used when omitted.
Default	0 dB

Details

This command is not available when PHICH is set to Off or when PHICH Power Boosting is set to Auto.

This command is available when Test Model 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: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 not available when PHICH is set to Off.

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

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:NG <mode>
```

Parameter

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

Details

This command is not available when PHICH is set to Off.

It can be set when Test Model is Off.

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
`NORM`	Normal
`EXT`	Extended

Example of Use

To query the PHICH duration.

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

2.3.23 Total EVM and Constellation Composite Calculation

:CALCulate:EVM:TEVM:RS INCLude|EXCLude

Total EVM and Constellation Composite Calculation - RS

Function

This command sets whether to include reference signal elements for Total EVM calculation.

Command

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

Parameter

<mode>	Reference Signal
INCLude	Includes (Default)
EXCLude	Excludes

Example of Use

To exclude reference signal elements for Total EVM calculation.

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

:CALCulate:EVM:TEVM:RS?

Total EVM and Constellation Composite Calculation - RS Query

Function

This command queries whether reference signal elements are included for Total EVM calculation.

Query

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

Response

```
<mode>
```

Parameter

<mode>	Reference Signal
INCL	Included
EXCL	Excluded

Example of Use

To query whether reference signal elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PDSCh INCLude|EXCLude

Total EVM and Constellation Composite Calculation - PDSCH

Function

This command sets whether to include PDSCH elements for Total EVM calculation.

Command

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

Parameter

<mode>	PDSCH
`INCLude`	Includes (Default)
`EXCLude`	Excludes

Example of Use

To exclude PDSCH elements for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PDSCh?

Total EVM and Constellation Composite Calculation - PDSCH Query

Function

This command queries whether PDSCH elements are included for Total EVM calculation.

Query

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

Response

```
<mode>
```

Parameter

<mode>	PDSCH
`INCL`	Included
`EXCL`	Excluded

Example of Use

To query whether PDSCH elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PBCH INCLude|EXCLude

Total EVM and Constellation Composite Calculation - PBCH

Function

This command sets whether to include PBCH elements for Total EVM calculation.

Command

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

Parameter

<mode>	PBCH
`INCLude`	Includes
`EXCLude`	Excludes

Example of Use

To exclude PBCH elements for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PBCH?

Total EVM and Constellation Composite Calculation - PBCH Query

Function

This command queries whether PBCH elements are included for Total EVM calculation.

Query

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

Response

```
<mode>
```

Parameter

<mode>	PBCH
`INCL`	Included
`EXCL`	Excluded

Example of Use

To query whether PBCH elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PSS INCLude|EXCLude

Total EVM and Constellation Composite Calculation - P-SS

Function

This command sets whether to include primary synchronization signal elements for Total EVM calculation.

Command

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

Parameter

`<mode>`	Primary Synchronization Signal
`INCLude`	Includes
`EXCLude`	Excludes

Example of Use

To exclude primary synchronization signal elements for Total EVM calculation.

```
CALC:EVM:TEVM:PSS EXCL
```

:CALCulate:EVM:TEVM:PSS?

Total EVM and Constellation Composite Calculation - P-SS Query

Function

This command queries whether primary synchronization signal elements are included for Total EVM calculation.

Query

```
:CALCulate:EVM:TEVM:PSS?
```

Response

```
<mode>
```

Parameter

`<mode>`	Primary Synchronization Signal
`INCL`	Included
`EXCL`	Excluded

Example of Use

To query whether primary synchronization signal elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:SSS INCLude|EXCLude

Total EVM and Constellation Composite Calculation - S-SS

Function

This command sets whether to include secondary synchronization signal elements for Total EVM calculation.

Command

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

Parameter

<mode>	Secondary Synchronization Signal
INCLude	Includes
EXCLude	Excludes

Example of Use

To exclude secondary synchronization signal elements for Total EVM calculation.

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

:CALCulate:EVM:TEVM:SSS?

Total EVM and Constellation Composite Calculation - S-SS Query

Function

This command queries whether secondary synchronization signal elements are included for Total EVM calculation.

Query

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

Response

```
<mode>
```

Parameter

<mode>	Secondary Synchronization Signal
INCL	Included
EXCL	Excluded

Example of Use

To query whether secondary synchronization signal elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PDCCh INCLude|EXCLude

Total EVM and Constellation Composite Calculation - PDCCH

Function

This command sets whether to include PDCCH elements for Total EVM calculation.

Command

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

Parameter

`<mode>`	PDCCH
`INCLude`	Includes
`EXCLude`	Excludes

Example of Use

To exclude PDCCH elements for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PDCCh?

Total EVM and Constellation Composite Calculation - PDCCH Query

Function

This command queries whether PDCCH elements are included for Total EVM calculation.

Query

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

Response

```
<mode>
```

Parameter

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

Example of Use

To query whether PDCCH elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PCFich INCLude|EXCLude

Total EVM and Constellation Composite Calculation - PCFICH

Function

This command sets whether to include PCFICH elements for Total EVM calculation.

Command

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

Parameter

`<mode>`	PCFICH
`INCLude`	Includes (Default)
`EXCLude`	Excludes

Example of Use

To exclude PCFICH elements for Total EVM calculation.

```
CALC:EVM:TEVM:PCF EXCL
```

:CALCulate:EVM:TEVM:PCFich?

Total EVM and Constellation Composite Calculation - PCFICH Query

Function

This command queries whether PCFICH elements are included for Total EVM calculation.

Query

```
:CALCulate:EVM:TEVM:PCFich?
```

Response

```
<mode>
```

Parameter

`<mode>`	PCFICH
`INCL`	Included
`EXCL`	Excluded

Example of Use

To query whether PCFICH elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:PHICh INCLude|EXCLude

Total EVM and Constellation Composite Calculation - PHICH

Function

This command sets whether to include PHICH elements for Total EVM calculation.

Command

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

Parameter

`<mode>`	PHICH
`INCLude`	Includes (Default)
`EXCLude`	Excludes

Example of Use

To exclude PHICH elements for Total EVM calculation.

`CALC:EVM:TEVM:PHIC EXCL`

:CALCulate:EVM:TEVM:PHICh?

Total EVM and Constellation Composite Calculation - PHICH Query

Function

This command queries whether PHICH elements are included for Total EVM calculation.

Query

`:CALCulate:EVM:TEVM:PHICh?`

Response

`<mode>`

Parameter

`<mode>`	PHICH
`INCL`	Included
`EXCL`	Excluded

Example of Use

To query whether PHICH elements are included for Total EVM calculation.

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

:CALCulate:EVM:TEVM:DTX INCLude|EXCLude

Total EVM and Constellation Composite Calculation - DTX

Function

This command sets whether to include DTX (channels not assigned) elements in the total EVM calculation.

Command

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

Parameter

`<mode>`	DTX
`INCLude`	Include
`EXCLude`	Exclude (Default)

Example of Use

To exclude DTX elements from the total EVM calculation.

```
CALC:EVM:TEVM:DTX EXCL
```

:CALCulate:EVM:TEVM:DTX?

Total EVM and Constellation Composite Calculation - DTX Query

Function

This command queries whether DTX elements are included in the total EVM calculation.

Query

```
:CALCulate:EVM:TEVM:DTX?
```

Response

```
<mode>
```

Parameter

`<mode>`	DTX
`INCL`	Include
`EXCL`	Exclude

Example of Use

To query whether DTX elements are included in the total EVM calculation.

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

2.3.24 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 and PDSCH Modulation Scheme is NOT set to AUTO.

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 within the target measurement 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` dB is used when omitted.
Default	0 dB

Details

This command is not available when PDSCH Power Boosting is set to Auto.

This command is available when CC Test Model 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
```

2.3.25 Virtual Resource Block Type

:CALCulate:EVM:VRBType LOCalized|DISTributed

Virtual Resource Block Type

Function

This specifies the Virtual Resource Block Type.

Command

```
:CALCulate:EVM:VRBType <mode>
```

Parameter

<mode>	Virtual Resource Block Type
LOC	Localized
DIST	Distributed

Example of Use

To set Virtual Resource Block Type to Distributed.

```
:CALC:EVM:VRBT DIST
```

:CALCulate:EVM:VRBType?

Virtual Resource Block Type Query

Function

This queries the Virtual Resource Block Type.

Query

```
:CALCulate:EVM:VRBType?
```

Response

```
<mode>
```

Parameter

<mode>	Virtual Resource Block Type
LOC	Localized
DIST	Distributed

Example of Use

To query the Virtual Resource Block Type.

```
CALC:EVM:VRBT?
> DIST
```

2.3.26 Optional Measurements

:CALCulate:EVM:OPTional ON|OFF|1|0

Optional Measurements

Function

This command sets Optional Measurement function to On/Off.

Command

```
:CALCulate:EVM:OPTional <switch>
```

Parameter

<switch>	Optional Measurements On/Off
OFF|0	Off (Default)
ON|1	On

Example of Use

To set Optional Measurements to On.

```
CALC:EVM:OPT ON
```

:CALCulate:EVM:OPTional?

Optional Measurements Query

Function

This command queries Optional Measurement function to On/Off.

Query

```
:CALCulate:EVM:OPTional?
```

Response

```
<switch>
```

Parameter

<switch>	Optional Measurements On/Off
0	Off
1	On

Example of Use

To query Optional Measurement function On/Off status.

```
CALC:EVM:OPT?
> 1
```

2.3.27 Cyclic Prefix Mode

:CALCulate:EVM:CP:MODE NORMal|EXTended

Cyclic Prefix Mode

Function

When in MIMO Summary mode, this command sets the Cyclic Prefix (CP) mode.

Command

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

Parameter

`<mode>`	Cyclic Prefix (CP) mode
`NORMal`	Normal CP measurement mode (Default)
`EXTended`	Extended CP measurement mode

Example of Use

To set Cyclic Prefix to Extended CP measurement mode.

```
CALC:EVM:CP:MODE EXT
```

:CALCulate:EVM:CP:MODE?

Cyclic Prefix Mode Query

Function

When in MIMO Summary mode, this command queries the Cyclic Prefix (CP) mode.

Query

```
:CALCulate:EVM:CP:MODE?
```

Response

```
<mode>
```

Parameter

`<mode>`	Cyclic Prefix mode
`NORM`	Normal CP measurement mode
`EXT`	Extended CP measurement mode

Example of Use

To query the Cyclic Prefix mode.

```
CALC:EVM:CP:MODE?
> EXT
```

2.3.28 Timing Offset Reference

:CALCulate:EVM:TIME:OFFSet ANTenna|EXTRigger

Timing Offset Reference

Function

When in MIMO Summary mode, this command sets Timing Offset reference.

Command

```
:CALCulate:EVM:TIME:OFFSet <mode>
```

Parameter

<mode>	Timing Offset reference
ANTenna	Referenced to the signal at specified Antenna Port (Default)
EXTRigger	Referenced to External Trigger

Example of Use

To set Timing Offset reference to referenced to Antenna Port.

```
CALC:EVM:TIME:OFFS ANT
```

:CALCulate:EVM:TIME:OFFSet?

Timing Offset Reference Query

Function

When in MIMO Summary mode, this command queries Timing Offset reference.

Query

```
:CALCulate:EVM:TIME:OFFSet?
```

Response

```
<mode>
```

Parameter

<mode>	Timing Offset reference
ANT	Referenced to the signal at specified Antenna Port
EXTR	Referenced to External Trigger

Example of Use

To query Timing Offset reference.

```
CALC:EVM:TIME:OFFS?
> ANT
```

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	: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 PreAmp	[: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

Parameter	Device Message
CC Bandwidth	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth 20|15|10|5|3|1M4
	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth?
CC Test Model	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel OFF|TM1_1|TM1_2|TM2|TM3_1|TM3_2|TM3_3
	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:TMODel?
CC Synchronization Mode	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE RS|SS
	[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:SYNChronization:MODE?
CC Reference Signal	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE CELL|AUTO
	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE?
	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid <integer>
	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:CELLid?
	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting <rel_power>
	:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:POWer:BOOSting?
	:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer 1|2|4
	:CALCulate:BATCh:CC[0]|1|2|3|4:ANTenna:NUMBer?
	:CALCulate:BATCh:CC[0]|1|2|3|4:APORt <integer>
	:CALCulate:BATCh:CC[0]|1|2|3|4:APORt?
Batch Analysis Time Starting Subframe Number	[:SENSe]:BATCh:CAPTure:TIME:STARt <integer>
	[:SENSe]:BATCh:CAPTure:TIME:STARt?
Batch Analysis Time Measurement Interval	[:SENSe]:BATCh:CAPTure:TIME:LENGth <integer>
	[:SENSe]:BATCh:CAPTure:TIME:LENGth?
Batch Analysis Time Starting OFDM Symbol Number	[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt <integer>
	[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:STARt?
Batch Analysis Time Measurement Interval for Unwanted Emissions	[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth <integer>
	[:SENSe]:BATCh:CAPTure:TIME:UWEMissions:LENGth?
CC PDSCH Modulation Scheme	:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation QPSK|16Qam|64Qam|256Qam|AUTO
	:CALCulate:BATCh:CC[0]|1|2|3|4:PDSCh:MODulation?
CC EVM Window	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth <integer>
	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth?
	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W <integer>
	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:W?
	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE TS|W
	:CALCulate:BATCh:CC[0]|1|2|3|4:WLENgth:TYPE?

Table 2.4-2 Device Messages for Setting System Parameters (Cont'd)

Parameter	Device Message
CC PBCH and Synchronization Signal Presence	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence OFF|ON|PBCH|SS|0|1|2|3
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence?
CC Batch Channel Estimation	:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:CHANnel:ESTimation?
CC Measurement Filter Type	:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter NORMal|NARRow
	:CALCulate:BATCh:CC[0]|1|2|3|4:MFILter?
CC PBCH	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe] OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH[:STATe]?
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:AUTO?
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting <rel_power>
	:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:POWer:BOOSting?
CC Primary Synchronization Signal	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe] OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS[:STATe]?
	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:AUTO?
	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting <rel_power>
	:CALCulate:BATCh:CC[0]|1|2|3|4:PSS:POWer:BOOSting?
CC Secondary Synchronization Signal	:CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe] OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:SSS[:STATe]?
	: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?
	: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	:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCH[:STATe] OFF|ON|0|1
	:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCH[:STATe]?
	: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?
	:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCH:POWer:BOOSting <rel_power>
	:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCH:POWer:BOOSting?
	: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:NUMBer <mode>
	:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:SYMBol: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="6">CC PDCCH</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing AUTO|FULL|EASY</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:FORMat 0|1|2|3</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:FORMat?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer?</td></tr>
<tr><td rowspan="6">CC PCFICH</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>: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>: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="10">CC PHICH</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>: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>: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>: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>: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="4">CC PDSCH</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>: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)

<table>
<tr><th>Parameter</th><th>Device Message</th></tr>
<tr><td rowspan="4">Batch Measure</td><td>[:SENSe]:BATCh:BAND[0]|1|2[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:BAND[0]|1|2[:STATe]?</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe] OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe]?</td></tr>
<tr><td rowspan="2">Band Contiguous Mode</td><td>[:SENSe]:BATCh:BAND[0]|1|2:CONTiguous OFF|ON|0|1</td></tr>
<tr><td>[:SENSe]:BATCh:BAND[0]|1|2:CONTiguous?</td></tr>
<tr><td rowspan="2">Band OBUE Standard</td><td>[: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</td></tr>
<tr><td>[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard?</td></tr>
<tr><td rowspan="2">Band OBUE Standard Additional</td><td>[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional OFF|1|2|3</td></tr>
<tr><td>[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional?</td></tr>
<tr><td rowspan="2">CC Frequency Band</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND 0|1|2</td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:BAND?</td></tr>
<tr><td rowspan="2">CC Frequency Offset</td><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet <freq></td></tr>
<tr><td>[:SENSe]:BATCh:CC[0]|1|2|3|4:FREQuency:OFFSet?</td></tr>
<tr><td rowspan="12">CC CSI-RS</td><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe] OFF|ON|0|1</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs[:STATe]?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:CONFig?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity 5|10</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:PERiodicity?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:SUBFrame:OFFSet?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer 1|2|4|8</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:ANTenna:NUMBer?</td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt <integer></td></tr>
<tr><td>:CALCulate:BATCh:CC[0]|1|2|3|4:CSIRs:APORt?</td></tr>
</table>

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	30 MHz to the upper limit of the main unit 100 MHz to the upper limit of the main unit (MS269xA-004/104/078/178) 300 MHz to the upper limit of the main unit (MS2830A-078)
	Resolution	1 Hz
	Suffix code	HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ Hz is used when omitted.
	Default	2110 MHz (Band0) 1960 MHz (Band1) 1842.5MHz (Band2)

Details

Band1 and Band2 can be selected only when MX269020A-001 and MS269xA-004/104/078/178 are installed.
However, Band1 and Band2 cannot be selected when MS2830A is used.

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

Example of Use

To set the frequency of the Band0 to 2.000 GHz.

```
BATC:BAND:FREQ:CENT 2.000GHZ
```

[: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	30 MHz to the upper limit of the main unit 100 MHz to the upper limit of the main unit (MS269xA-004/104/078/178) 300 MHz to the upper limit of the main unit (MS2830A-078)
Resolution	1 Hz Value is returned in Hz units.

Example of Use

To query the Band0 frequency.

```
BATC:BAND:FREQ:CENT?
> 2000000000
```

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 is set to Off.) (–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp is set to On.)
Resolution	0.01 dB
Unit	1 dBm
Suffix code	`DBM` 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 is set to Off.) (–80.00 + level offset) to (10.00 + level offset) dBm (Pre-Amp is set to On.)
Resolution	0.01 dB Value is returned in dBm units.

Example of Use

To query the input level.

```
BATC:BAND:POW:RANG:ILEV?
> -15.00
```

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 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

[:SENSe]:BATCh:BAND[0]|1|2:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1

Band Pre Amp

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.

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 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 Channel Bandwidth

[:SENSe]:BATCh:CC[0]|1|2|3|4:RADio:CBANdwidth 20|15|10|5|3|1M4

CC Channel 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 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 the synchronized signal for the CC to Reference Signal.
SS	Sets the synchronized signal for the CC to Synchronization Signal .

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 the synchronized signal for the CC to Reference Signal.
SS	Sets the synchronized signal for the CC to Synchronization Signal .

Example of Use

To query the synchronized signal for the CC0.

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

2.4.10 CC Reference Signal

:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE CELL|AUTO

CC Reference Signal Mode

Function

This command sets the mode of the reference signal for the CC.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE <mode>
```

Parameter

<mode>	Reference Signal
CELL	Reference Signal is determined in accordance with the setting of the cell ID.
AUTO	Reference Signal is determined through automatic judgment. (Default)

Details

Auto can be selected only when CC Synchronization Mode is set to Synchronization Signal.

Example of Use

To set Auto for the mode of the reference signal for the CC0.

```
CALC:BATC:CC:RSIG:MODE AUTO
```

:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE?

CC Reference Signal Mode Query

Function

This command queries the mode of the reference signal for the CC.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:RSIGnal:MODE?
```

Response

```
<mode>
```

Parameter

`<mode>`	Reference Signal
`CELL`	Reference Signal is determined in accordance with the setting of the cell ID.
`AUTO`	Reference Signal is determined through automatic judgment.

Example of Use

To query the mode of the reference signal for the CC0.

```
CALC:BATC:CC:RSIG:MODE?
> AUTO
```

: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. This parameter is valid when Reference Signal Mode is set to Using Cell ID or Loa File.

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

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 Reference Signal 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` dB is used when omitted.
Default	0 dB

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 Reference Signal 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.

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 Reference Signal 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 (Number of Antenna Ports –1)
Resolution	1
Suffix code	None
Default	0

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 Reference Signal 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 (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
```

2.4.11 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	0 to 9
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	0 to 9
Resolution	1

Example of Use

To query the analysis start position of Modulation Analysis.

```
BATC:CAPT:TIME:STAR?
> 2
```

2.4.12 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	1 to (10 – Batch Analysis Time Starting Subframe Number)
Resolution	1
Suffix code	None
Default	1

Example of Use

To set the analysis subframe length of Modulation Analysis to 2.

```
BATC:CAPT:TIME:LENG 2
```

[: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	1 to (10 – 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
```

2.4.13 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 139
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 139
Resolution	1

Example of Use

To query the analysis start position of Unwanted Emissions.

```
BATC:CAPT:TIME:UWEM:STAR?
> 2
```

2.4.14 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	1 to (140 – Batch Analysis Time Starting OFDM Symbol 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	1 to (140 – Batch Analysis Time Starting OFDM Symbol Number)
Resolution	1

Example of Use

To query the analysis OFDM Symbol length of Unwanted Emissions.

```
BATC:CAPT:TIME:UWEM:LENG?
> 2
```

2.4.15 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 the modulation mode to QPSK for analysis.
`16Qam`	Sets the modulation mode to 16QAM for analysis.
`64Qam`	Sets the modulation mode to 64QAM for analysis.
`256Qam`	Sets the modulation mode to 256QAM for analysis.
`AUTO`	Analyzes an input signal after judging its modulation scheme automatically. (Excluding 256QAM) (default).

Details

Select AUTO if the measurement target includes multiple modulation schemes.

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	Sets the modulation mode to QPSK for analysis.
16Qam	Sets the modulation mode to 16QAM for analysis.
64Qam	Sets the modulation mode to 64QAM for analysis.
256Q	Sets the modulation mode to 256QAM 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
```

2.4.16 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 When CC Channel Bandwidth is 3 MHz: 96 Ts When CC Channel Bandwidth is 5 MHz: 128 Ts When CC Channel Bandwidth is 10 MHz: 132 Ts When CC Channel Bandwidth is 15 MHz: 136 Ts 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
```

2.4.17 CC PBCH and Synchronization Signal Presence

:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence OFF|ON|PBCH|SS|0|1|2|3

CC PBCH and Synchronization Signal Presence

Function

This command sets whether to include PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal to the measurement target.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence <switch>
```

Parameter

<switch>	Inclusion/exclusion of PBCH and Synchronization Signal
OFF|0	Excludes PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal from the measurement target.
ON|1	Includes PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal to the measurement target (Default).
PBCH|2	Includes PBCH to the measurement target.
SS|3	Includes Primary Synchronization Signal and Secondary Synchronization Signal to the measurement target.

Details

The settings of P-SS and S-SS cannot be changed when CC Synchronization Mode is set to Synchronization Signal.

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

Example of Use

To include PBCH and Synchronization Signal to the measurement target.

```
CALC:BATC:CC:PBCH:PRES ON
```

:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence?

CC PBCH and Synchronization Signal Presence Query

Function

This command queries whether PBCH, Primary Synchronization Signal, and Secondary Synchronization Signal are included in the measurement target.

Query

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PBCH:PRESence?
```

Response

```
<switch>
```

Parameter

`<switch>`	Inclusion/exclusion of PBCH and Synchronization Signal
0	PBCH, Primary Synchronization Signal, and Synchronization Signal are excluded from the measurement target.
1	PBCH, Primary Synchronization Signal, and Synchronization Signal are included in the measurement target.
2	PBCH is included in the measurement target.
3	Primary Synchronization Signal and Secondary Synchronization Signal are included in the measurement target.

Example of Use

To query whether PBCH and Synchronization Signal are included in the measurement target.

```
CALC:BATC:CC:PBCH:PRES?
> 1
```

2.4.18 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>	Batch 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>	Batch 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
```

2.4.19 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.

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

Even if Narrow is selected, this function measures only one carrier signal.

This command is fixed `NORMal` when Band is set to Contiguous.

For the internal processing, the wideband filter intended for Carrier Aggregation is selected.

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.

Example of Use

To query the Measurement Filter Type for the CC0

```
CALC:BATC:CC:MFIL?
> NARR
```

2.4.20 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>`	CC 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>`	Automatic detection On/Off
`OFF|0`	Off
`ON|1`	On (Default)

Details

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

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>`	Automatic detection 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 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
```

2.4.21 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 Test Model is set to Off.
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>`	Automatic detection 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>`	Automatic detection 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 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 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
```

2.4.22 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 Test Model is set to Off.
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>	Automatic detection 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 On.

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>`	Automatic detection 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 dB is used when omitted.
Default	0 dB

Details

This command is available when 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
```

2.4.23 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 not available when 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>`	Automatic detection 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 dB is used when omitted.
Default	0 dB

Details

This command is available when CC PDCCH is set to On and CC PDCCH Power Auto 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

CC Number of 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>	Automatic detection On/Off
OFF|0	Off
ON|1	On (Default)

Details

This command is available when 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?

CC Number of 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>	Automatic detection 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:NUMBer <mode>

CC Number of 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 <mode>
```

Parameter

`<mode>`	Number of symbols
Range	When CC Channel Bandwidth is set to 1.4 MHz: 0 to 4 When CC Channel Bandwidth is set to other than 1.4 MHz: 0 to 3
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 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?

CC Number of 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

```
<mode>
```

Parameter

<mode>	Number of symbols
Range	When CC Channel Bandwidth is set to 1.4 MHz: 0 to 4 When CC Channel Bandwidth is set to other than 1.4 MHz: 0 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|FULL|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
`FULL`	Performs measurement assuming all resource elements as CC PDCCH.
`EASY`	Performs measurement according to the specified CC PDCCH format and the number of CC PDCCHs.
`FILE`	Performs measurement according to the settings in the specified file.

Details

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

Example of Use

To perform `measurement` assuming all resource elements of the CC0 as CC PDCCH.

```
CALC:BATC:CC:PDCC:MAPP FULL
```

: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
FULL	Performs measurement assuming all resource elements as CC PDCCH.
EASY	Performs measurement according to the specified CC PDCCH format and the number of CC PDCCHs.
FILE	Performs measurement according to the settings in the specified file.

Example of Use

To query the CC PDCCH mapping specification method for the CC0.

```
CALC:BATC:CC:PDCC:MAPP?
> FULL
```

: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 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 PDCCHs.

Command

```
:CALCulate:BATCh:CC[0]|1|2|3|4:PDCCh:MAPPing:EASY:NUMBer
<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 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 PDCCHs.

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
```

2.4.24 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>`	Automatic detection 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>`	Automatic detection 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 dB is used when omitted.
Default	0 dB

Details

This command is available when 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
```

2.4.25 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>`	Automatic detection 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>`	Automatic detection 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` dB is used when omitted.
Default	0 dB

Details

This command is available when 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: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 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 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
```

2.4.26 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>`	Automatic detection On/Off
`OFF|0`	Off
`ON|1`	On (Default)

Details

This command is available 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>	Automatic detection 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 dB is used when omitted.
Default	0 dB

Details

This command is available when 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
```

2.4.27 Batch Modulation Analysis

[:SENSe]:BATCh:EVM[:STATe] OFF|ON|0|1

Batch Modulation Analysis

Function

This command sets the modulation analysis in the batch measurement to On/Off.

Command

```
[:SENSe]:BATCh:EVM[:STATe] <switch>
```

Parameter

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

Example of Use

To configure a setting to include Batch Modulation Analysis.

```
BATC:EVM ON
```

[:SENSe]:BATCh:EVM[:STATe]?

Batch Modulation Analysis Query

Function

This command queries the On/Off status of the modulation analysis in the Batch measurement.

Query

```
[:SENSe]:BATCh:EVM[:STATe]?
```

Response

```
<switch>
```

Parameter

`<switch>`	Modulation Analysis On/Off
`OFF|0`	Off
`ON|1`	On

Example of Use

To query the setting for Batch Modulation Analysis.

```
BATC:EVM?
> 1
```

2.4.28 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>`	OBW measurement On/Off
`OFF|0`	Off
`ON|1`	On (Default)

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>`	OBW measurement 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
```

2.4.29 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>`	ACLR On/Off
`OFF|0`	Off
`ON|1`	On (Default)

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:BAND 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>`	ACLR 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
```

2.4.30 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>	OBUE On/Off
OFF|0	Off
ON|1	On (Default)

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>	OBUE 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
```

2.4.31 Batch Measure 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>`	Band measurement 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>`	Band measurement 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 (Component Carrier) measurement to On/Off.

Command

```
[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe] <switch>
```

Parameter

`<switch>`	CC measurement On/Off
`OFF|0`	Off
`ON|1`	On

Default

When the MX269020A-001 is installed, and MS269xA-004/104/078/178 or MS2830A-078 are installed.

CC0	ON
CC1, 2, 3, 4	OFF

When the MX269020A-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 MX269020A-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 (Component Carrier) measurement.

Query

```
[:SENSe]:BATCh:CC[0]|1|2|3|4[:STATe]?
```

Response

`<switch>`

Parameter

`<switch>`	CC measurement On/Off
`0`	Off
`1`	On

Example of Use

To query the On/Off status of the CC0 measurement.

```
BATC:CC?
> 1
```

2.4.32 Band Contiguous Mode

[:SENSe]:BATCh:BAND[0]|1|2:CONTiguous 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 can be selected only when MX269020A-001 is installed.

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
```

2.4.33 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
```

2.4.34 Band OBUE Standard Additional

[:SENSe]:BATCh:BAND[0]|1|2:OBUE:STANdard:ADDitional OFF|1|2|3|4

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>`	Additional standard template for OBUE measurement
`OFF`	Not use the additional standard template (Default)
`1`	Band 5
`2`	Band 2, 4, 10, 23, 25, 35, 36, 41
`3`	Band 12, 13, 14, 17

Example of Use

To set the additional standard template for OBUE measurement of Band0 to Band 5.

```
BATC:BAND:OBUE:STAN:ADD 1
```

[: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>`	Additional standard template for OBUE measurement
`OFF`	Not use the additional standard template (Default)
`1`	Band 5
`2`	Band 2, 4, 10, 23, 25, 35, 36, 41
`3`	Band 12, 13, 14, 17

Example of Use

To query the additional standard template for OBUE measurement of Band0.

```
BATC:BAND:OBUE:STAN:ADD?
> 1
```

2.4.35 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 MX269020A-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
```

2.4.36 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.) ± {(31.25 MHz – CC Channel Bandwidth) / 2} (When MS269xA-004/104/078/178 or MS2830A-078 are not installed.)
Resolution	300 Hz (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 MX269020A-001.

Example of Use

To set the center frequency of CC0 to 5 MHz.

```
BATC:CC:FREQ:OFFS 5MHZ
```

2

SCPI Device Message Details

[: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.) ± {(31.25 MHz – CC Channel Bandwidth) / 2} (When MS269xA-004/104/078/178 or MS2830A-078 are not installed.)
Resolution	300 Hz (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
```

2.4.37 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 MX269020A-001 is installed.

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 When CC CSI-RS Number of Antenna Ports is 4 : 0 to 9 When CC CSI-RS Number of Antenna Ports is 1 or 2 : 0 to 19
Resolution	1
Suffix code	None
Default	0

Details

This command is available when 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 When CC CSI-RS Number of Antenna Ports is 4 : 0 to 9 When CC CSI-RS Number of Antenna Ports is 1 or 2 : 0 to 19
	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 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
	When CC CSI-RS Periodicity T is 5 : 0 to 4
Resolution	1
Suffix code	None
Default	0

Details

This command is available when 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 MX269020A-001 is installed.)

Details

This command is available when 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	15 to 15 + (CC CSI-RS Number of Antenna – 1)
Resolution	1
Suffix code	None
Default	15

Details

This command is available when CC CSI-RS is set to On.

Example of Use

To set the CC CSI-RS antenna port number for the CC0 to 16.

```
CALC:BATC:CC:CSIR:APOR 16
```

: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	15 to 15 + (CC CSI-RS Number of Antenna – 1)
Resolution	1

Example of Use

To query the CC CSI-RS antenna port number for the CC0.

```
CALC:BATC:CC:CSIR:APOR?
> 16
```

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 Device Messages for Operations Common to 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>
Cancel Execute Save Captured Data	:MMEMory:STORe:IQData:CANCel
Output Rate for Save Captured Data	:MMEMory:STORe:IQData:RATE <freq>
	:MMEMory:STORe:IQData:RATE?
Capture Time Auto	[:SENSe]:SWEep:TIME:AUTO ON|OFF|1|0
	[:SENSe]:SWEep:TIME:AUTO?
Capture Time	[: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|WIF|RFBurst|FRAMe
	:TRIGger[:SEQuence]:SOURce?
Trigger Slope	:TRIGger[:SEQuence]:SLOPe POSitive|NEGative
	:TRIGger[:SEQuence]:SLOPe?
Trigger Delay	:TRIGger[:SEQuence]:DELay <time>
	:TRIGger[:SEQuence]:DELay?
Wide IF Trigger Level	:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <ampl>
	:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?
Trigger Hold	:TRIGger[:SEQuence]:HOLDoff <time>
	:TRIGger[:SEQuence]:HOLDoff?

Table 2.6-1 Device Messages for Operations Common to Measurement Functions (Cont'd)

Function	Device Message
Trigger Hold On/Off	:TRIGger[:SEQuence]:HOLDoff:STATe OFF|ON|0|1
	:TRIGger[:SEQuence]:HOLDoff:STATe?
Frame Trigger Period	:TRIGger[:SEQuence]:FRAMe:PERiod <time>
	:TRIGger[:SEQuence]:FRAMe:PERiod?
Frame Sync Source	:TRIGger[:SEQuence]:FRAMe:SYNC EXTernal[1]|IMMediate|Off|WIF|RFBurst
	:TRIGger[:SEQuence]:FRAMe:SYNC?
Frame Sync Offset	:TRIGger[:SEQuence]:FRAMe:OFFSet <time>
	:TRIGger[:SEQuence]:FRAMe:OFFSet?

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

This command is available only when the waveform capture time (Capture Time) is set to Manual.

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
`MIMO`	MIMO Summary measurement
`BATC`	Batch 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. Specify a character string enclosed by single (' ') or double (" ") quotation marks.
`<device>`	Name of the drive to be saved. Drive name such as A, B, D or E.

Details

Files are saved to the following directory in the specified drive.
\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\3GLTE 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 waveform data into drive D using the file name "DATA".

```
MMEM:STOR:IQD "DATA",D
```

:MMEMory:STORe:IQData:CANCel

Cancel Execute Save Captured Data

Function

This command cancels saving of the waveform data file.

Command

```
:MMEMory:STORe:IQData:CANCel
```

Details

This command is not available when the Batch Measurement function is executed.

Example of Use

To cancel digitizing.

```
MMEM:STOR:IQD:CANC
```

:MMEMory:STORe:IQData:RATE <freq>

Output Rate for Save Captured Data

Function

This command sets the output rate when executing Save Captured Data.

Command

```
:MMEMory:STORe:IQData:RATE <freq>
```

Parameter

`<freq>`		Output rate
	Range	20 to 50 MHz
	Suffix code	`HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ`
		Hz is used when omitted.

Details

This command is not available when the Batch Measurement function is executed.

Example of Use

To set 30 MHz for the output rate.

```
MMEM:STOR:IQD:RATE 30MHZ
```

:MMEMory:STORe:IQData:RATE?

Output Rate for Save Captured Data

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 to set the waveform capture time (Capture Time) automatically or manually.

Command

```
[:SENSe]:SWEep:TIME:AUTO <switch>
```

Parameter

`<switch>`	Capture time setting mode
`ON|1`	Automatic setting
`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 set the waveform capture time automatically.

```
SWE:TIME:AUTO ON
```

[:SENSe]:SWEep:TIME:AUTO?

Capture Time Auto/Manual Query

Function

This command queries whether the waveform capture time (Capture Time) is set automatically or manually.

Query

```
[:SENSe]:SWEep:TIME:AUTO?
```

Response

```
<switch>
```

Parameter

`<switch>`	Capture time setting mode
`1`	Automatic setting
`0`	Manual setting

Details

This command is not available when the Batch Measurement function is executed.

Example of Use

To query whether the waveform capture time is set automatically or manually.

```
SWE:TIME:AUTO?
> 1
```

[:SENSe]:SWEep:TIME <time>

Capture Time Length

Function

This command sets the capture time for the waveform.

Command

```
[:SENSe]:SWEep:TIME <time>
```

Parameter

<time>	Capture time (per frame)
Range/Resolution	1 to 200
Suffix code	None

Details

The automatic mode is switched to the manual mode when the capture sample 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 two seconds as the capture time.

```
SWE:TIME 2
```

[:SENSe]:SWEep:TIME?

Capture Time Length Query

Function

This command queries the capture time for the waveform.

Query

```
[:SENSe]:SWEep:TIME?
```

Response

```
<time>
```

Parameter

<time>	Capture time
Range/Resolution	1 to 200
Suffix code	None

Details

This command is not available when the Batch Measurement function is executed.

Example of Use

To query the capture time for the waveform.

```
SWE:TIME?
> 200
```

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|WIF|RFBurst|FRAMe

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
`WIF|RFBurst`	Wideband IF detection (Wide IF Video)
`FRAMe`	Frame period trigger

Details

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

MS269x Series does not support the Frame period trigger.

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
`WIF`	Wideband IF detection (Wide IF Video)
`FRAM`	Frame period trigger

Details

`SG` can be returned only when Vector Signal Generator option is installed.

MS269x Series does not support the Frame period trigger.

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 or MIMO Summary.)
	–0.5 to +0.5 s	(When the Measure is Batch Measurement.)
Resolution	20 ns	
Suffix code	`NS`, `US`, `MS`, `S` `S` is used when omitted.	
Default	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 or MIMO Summary.)
		–0.5 to +0.5 s	(When the Measure is Batch Measurement.)
	Resolution	20 ns	
		Value is returned in second units.	

Example of Use

To query the trigger delay time.

```
TRIG:DEL?
> 0.02000000
```

2.6.6 Wide IF Trigger Level

:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <ampl>

Wide IF Trigger Level

Function

This command sets the threshold at the level to start the capture against the Wide IF Video trigger.

Command

```
:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute <ampl>
```

Parameter

`<level>`	Threshold at the level to start the capture
Range	–60 to 50 dBm
Resolution	1 dB
Default value	–20 dBm

Details

This command is not available while the Replay function is being executed.

Example of Use

To set the threshold of the Wide IF Video trigger level to 10 dBm.

```
TRIG:WIF:LEV:ABS 10
```

:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?

Wide IF Trigger Level Query

Function

This command queries the threshold at the level to start the capture against the Wide IF Video trigger.

Query

```
:TRIGger[:SEQuence]:WIF|:RFBurst:LEVel:ABSolute?
```

Response

```
<level>
```

Parameter

`<level>`	Threshold at the level to start the capture
Range	–60 to 50 dBm
Resolution	1 dB
Suffix code	None, Value is returned in dBm units.

Example of Use

To query the threshold of the Wide IF Video trigger level.

```
TRIG:WIF:LEV:ABS?
> 10
```

2.6.7 Trigger Hold

:TRIGger[:SEQuence]:HOLDoff <time>

Trigger Hold

Function

This command sets the fixed amount of time trigger input is disabled between the first trigger input and the next trigger input.

Command

```
:TRIGger[:SEQuence]:HOLDoff <time>
```

Parameter

`<time>`	Specified time
Range	0 to 1 s
Resolution	10 ns
Suffix code	NS, US, MS, S
	S is used when the suffix code is omitted.
Default	100 μ s

Details

This command is not available for MS269x Series.
When this function is used to change a value, the Trigger Hold (ON/OFF) function is set to ON.

Example of Use

To set the amount of time trigger input is disabled to 100 ms.

```
TRIG:HOLD 100MS
```

:TRIGger[:SEQuence]:HOLDoff?

Trigger Hold Query

Function

This command queries the fixed amount of time trigger input is disabled between the first trigger input and the next trigger input.

Query

`TRIGger[:SEQuence]:HOLDoff?`

Response

`<time>`

Parameter

`<time>`	Specified time
Range	0 to 1 s
Resolution	10 ns
Suffix code	None. Value is returned in s units.
Default	100 μ s

Details

This command is not available for MS269x Series.

Example of Use

To query the amount of time trigger input is disabled.

```
TRIG:HOLD?
> 0.02000000
```

2.6.8 Trigger Hold On/Off

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

Trigger Hold On/Off

Function

This command sets the function for disabling trigger input between the first trigger input and the next trigger input for a fixed amount of time to On or Off.

Command

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

Parameter

`<switch>`	Trigger Hold On/Off
`ON|1`	Trigger Hold is On.
`OFF|0`	Trigger Hold is Off.

Details

This command is not available for MS269x Series.
When this function is set to On, the Trigger (On/Off) function is automatically set to On.

Example of Use

To set the setting for disabling trigger input for a fixed amount of time to On.

```
TRIG:HOLD:STAT ON
```

:TRIGger[:SEQuence]:HOLDoff:STATe?

Trigger Hold On/Off Query

Function

This command queries whether the function for disabling trigger input between the first trigger input and the next trigger input for a fixed amount of time is On or Off.

Query

```
:TRIGger[:SEQuence]:HOLDoff:STATe?
```

Response

```
<switch>
```

Parameter

`<switch>`	Trigger Hold On/Off
1	Trigger Hold is On.
0	Trigger Hold is Off.

Details

This command is not available for MS269x Series.

Example of Use

To query the setting for disabling trigger input for a fixed amount of time.

```
:TRIG:HOLD:STAT?
> 1
```

2.6.9 Frame Trigger Period

:TRIGger[:SEQuence]:FRAMe:PERiod <time>

Frame Trigger Period

Function

This command sets the period for frame trigger generation.

Command

```
:TRIGger[:SEQuence]:FRAMe:PERiod <time>
```

Parameter

`<time>`	Frame trigger
Range	1 μs to 1 s
Resolution	10 ns
Suffix code	`NS,US,MS,S` S is used when the suffix code is omitted.
Default	10 ms

Details

This command is not available for MS269x Series.

Example of Use

To set the frame trigger period to 10 ms.

```
TRIG:FRAM:PER 10MS
```

:TRIGger[:SEQuence]:FRAMe:PERiod?

Frame Trigger Period Query

Function

This command queries the period for frame trigger generation.

Query

```
:TRIGger[:SEQuence]:FRAMe:PERiod?
```

Response

```
<time>
```

Parameter

`<time>`	Delay time until the gate starts
Range	1 μs to 1 s
Resolution	10 ns
Suffix code	None. Value is returned in s units.

Details

This command is not available for MS269x Series.

Example of Use

To query the frame trigger period.

```
TRIG:FRAM:PER?
> 0.02000000
```

2.6.10 Frame Sync Source

:TRIGger[:SEQuence]:FRAMe:SYNC EXTernal[1]|IMMediate|Off|WIF|RFBurst

Frame Sync Source

Function

This command selects the synchronization signal source for starting a frame trigger.

Command

`:TRIGger[:SEQuence]:FRAMe:SYNC <sync>`

Parameter

`<sync>`	Sync signal source
`EXTernal[1]`	External input (Default)
`IMMediate|Off`	Free run
`WIF|RFBurst`	Wideband IF detection (Wide IF Video)

Details

This command is not available for MS269x Series.

Example of Use

To set the frame-trigger synchronization source to the Wide IF Video trigger.

```
TRIG:FRAM:SYNC WIF
```

:TRIGger[:SEQuence]:FRAMe:SYNC?

Frame Sync Source Query

Function

This command queries the synchronization signal source for starting a frame trigger.

Query

`:TRIGger[:SEQuence]:FRAMe:SYNC?`

Response

`<sync>`

Parameter

`<sync>`	Sync signal source
`EXT`	External input (Default)
`IMM`	Free run
`WIF`	Wideband IF detection (Wide IF Video)

Details

This command is not available for MS269x Series.

Example of Use

To query the frame-trigger synchronization source.

```
TRIG:FRAM:SYNC?
> WIF
```

2.6.11 Frame Sync Offset

:TRIGger[:SEQuence]:FRAMe:OFFSet <time>

Frame Sync Offset

Function

This command sets the offset time between when the signal source for generating a frame trigger is input and when the frame trigger is generated.

Command

```
:TRIGger[:SEQuence]:FRAMe:OFFSet <time>
```

Parameter

<time>	Specified time
Range	0 to 1 s
Resolution	10 ns
Suffix code	NS, US, MS, S
	S is used when the suffix code is omitted.
Default	0 s

Details

This command is not available for MS269x Series.

Example of Use

To set the offset time for generating a frame trigger to 100 ms.

```
TRIG:FRAM:OFFS 100MS
```

:TRIGger[:SEQuence]:FRAMe:OFFSet?

Frame Sync Offset Query

Function

This command queries the offset time between when the signal source for generating a frame trigger is input and when the frame trigger is generated.

Query

```
:TRIGger[:SEQuence]:FRAMe:OFFSet?
```

Response

```
<time>
```

Parameter

<time>	Offset time
Range	0 to 1 s
Resolution	10 ns
Suffix code	None. Value is returned in s units.

Example of Use

To query the offset time for generating a frame trigger.

```
TRIG:FRAM:OFFS?
> 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.

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

: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>
```

Response

<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]?
```

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: 1. Frequency Error (Average) [Hz] 2. Frequency Error (Maximum) [Hz] 3. Output Power (Average) [dBm] 4. Output Power (Maximum) [dBm] 5. Mean Power (Average) [dBm] 6. Mean Power (Maximum) [dBm] 7. EVM rms (Average) [%] 8. EVM rms (Maximum) [%] 9. EVM peak (Average) [%] 10. EVM peak (Maximum) [%] 11. EVM peak Symbol Number 12. EVM peak Subcarrier Number 13. Origin Offset (Average) [dB] 14. Origin Offset (Maximum) [dB] 15. Time Offset (Average) [seconds] 16. Time Offset (Maximum) [seconds] 17. Frequency Error PPM (Average) [ppm] 18. Frequency Error PPM (Maximum) [ppm] 19. Symbol Clock Error (Average) [ppm] 20. Symbol Clock Error (Maximum) [ppm] 21. IQ Skew (Average) [seconds] 22. IQ Skew (Maximum) [seconds] 23. IQ Imbalance (Average) [dB] 24. IQ Imbalance (Maximum) [dB] 25. IQ Quadrature Error (Average) [degree] 26. IQ Quadrature Error (Maximum) [degree]

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: 1. Total EVM result valid (1 = valid/0 = invalid) 2. Total EVM rms (Average) 3. Total EVM rms (Maximum) 4. Total EVM peak (Average) 5. Total EVM peak (Maximum) 6. Total EVM peak Symbol Number 7. Total EVM peak Subcarrier Number 8. Total EVM High rms (Average) 9. Total EVM High rms (Maximum) 10. Total EVM High peak (Average) 11. Total EVM High peak (Maximum) 12. Total EVM High peak Symbol Number 13. Total EVM High peak Subcarrier Number 14. Total EVM Low rms (Average) 15. Total EVM Low rms (Maximum) 16. Total EVM Low peak (Average) 17. Total EVM Low peak (Maximum) 18. Total EVM Low peak Symbol Number 19. Total EVM Low peak Subcarrier Number

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	20. PDSCH ALL EVM result valid (1 = valid/0 = invalid) 21. PDSCH ALL EVM rms (Average) 22. PDSCH ALL EVM rms (Maximum) 23. PDSCH ALL EVM peak (Average) 24. PDSCH ALL EVM peak (Maximum) 25. PDSCH ALL EVM peak Symbol Number 26. PDSCH ALL EVM peak Subcarrier Number 27. PDSCH ALL EVM High rms (Average) 28. PDSCH ALL EVM High rms (Maximum) 29. PDSCH ALL EVM High peak (Average) 30. PDSCH ALL EVM High peak (Maximum) 31. PDSCH ALL EVM High peak Symbol Number 32. PDSCH ALL EVM High peak Subcarrier Number 33. PDSCH ALL EVM Low rms (Average) 34. PDSCH ALL EVM Low rms (Maximum) 35. PDSCH ALL EVM Low peak (Average) 36. PDSCH ALL EVM Low peak (Maximum) 37. PDSCH ALL EVM Low peak Symbol Number 38. PDSCH ALL EVM Low peak Subcarrier Number 39. PDSCH QPSK EVM result valid (1 = valid/0 = invalid) 40. PDSCH QPSK EVM rms (Average) 41. PDSCH QPSK EVM rms (Maximum) 42. PDSCH QPSK EVM peak (Average) 43. PDSCH QPSK EVM peak (Maximum) 44. PDSCH QPSK EVM peak Symbol Number 45. PDSCH QPSK EVM peak Subcarrier Number 46. PDSCH QPSK EVM High rms (Average) 47. PDSCH QPSK EVM High rms (Maximum) 48. PDSCH QPSK EVM High peak (Average) 49. PDSCH QPSK EVM High peak (Maximum) 50. PDSCH QPSK EVM High peak Symbol Number 51. PDSCH QPSK EVM High peak Subcarrier Number 52. PDSCH QPSK EVM Low rms (Average) 53. PDSCH QPSK EVM Low rms (Maximum) 54. PDSCH QPSK EVM Low peak (Average) 55. PDSCH QPSK EVM Low peak (Maximum) 56. PDSCH QPSK EVM Low peak Symbol Number 57. PDSCH QPSK EVM Low peak Subcarrier Number

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	58. PDSCH 16QAM EVM result valid (1 = valid/0 = invalid) 59. PDSCH 16QAM EVM rms (Average) 60. PDSCH 16QAM EVM rms (Maximum) 61. PDSCH 16QAM EVM peak (Average) 62. PDSCH 16QAM EVM peak (Maximum) 63. PDSCH 16QAM EVM peak Symbol Number 64. PDSCH 16QAM EVM peak Subcarrier Number 65. PDSCH 16QAM EVM High rms (Average) 66. PDSCH 16QAM EVM High rms (Maximum) 67. PDSCH 16QAM EVM High peak (Average) 68. PDSCH 16QAM EVM High peak (Maximum) 69. PDSCH 16QAM EVM High peak Symbol Number 70. PDSCH 16QAM EVM High peak Subcarrier Number 71. PDSCH 16QAM EVM Low rms (Average) 72. PDSCH 16QAM EVM Low rms (Maximum) 73. PDSCH 16QAM EVM Low peak (Average) 74. PDSCH 16QAM EVM Low peak (Maximum) 75. PDSCH 16QAM EVM Low peak Symbol Number 76. PDSCH 16QAM EVM Low peak Subcarrier Number 77. PDSCH 64QAM EVM result valid (1 = valid/0 = invalid) 78. PDSCH 64QAM EVM rms (Average) 79. PDSCH 64QAM EVM rms (Maximum) 80. PDSCH 64QAM EVM peak (Average) 81. PDSCH 64QAM EVM peak (Maximum) 82. PDSCH 64QAM EVM peak Symbol Number 83. PDSCH 64QAM EVM peak Subcarrier Number 84. PDSCH 64QAM EVM High rms (Average) 85. PDSCH 64QAM EVM High rms (Maximum) 86. PDSCH 64QAM EVM High peak (Average) 87. PDSCH 64QAM EVM High peak (Maximum) 88. PDSCH 64QAM EVM High peak Symbol Number 89. PDSCH 64QAM EVM High peak Subcarrier Number 90. PDSCH 64QAM EVM Low rms (Average) 91. PDSCH 64QAM EVM Low rms (Maximum) 92. PDSCH 64QAM EVM Low peak (Average) 93. PDSCH 64QAM EVM Low peak (Maximum) 94. PDSCH 64QAM EVM Low peak Symbol Number 95. PDSCH 64QAM EVM Low peak Subcarrier Number

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	96. PDCCH EVM result valid (1 = valid/0 = invalid) 97. PDCCH EVM rms (Average) 98. PDCCH EVM rms (Maximum) 99. PDCCH EVM peak (Average) 100. PDCCH EVM peak (Maximum) 101. PDCCH EVM peak Symbol Number 102. PDCCH EVM peak Subcarrier Number 103. PDCCH EVM High rms (Average) 104. PDCCH EVM High rms (Maximum) 105. PDCCH EVM High peak (Average) 106. PDCCH EVM High peak (Maximum) 107. PDCCH EVM High peak Symbol Number 108. PDCCH EVM High peak Subcarrier Number 109. PDCCH EVM Low rms (Average) 110. PDCCH EVM Low rms (Maximum) 111. PDCCH EVM Low peak (Average) 112. PDCCH EVM Low peak (Maximum) 113. PDCCH EVM Low peak Symbol Number 114. PDCCH EVM Low peak Subcarrier Number 115. RS EVM result valid (1 = valid/0 = invalid) 116. RS EVM rms (Average) 117. RS EVM rms (Maximum) 118. RS EVM peak (Average) 119. RS EVM peak (Maximum) 120. RS EVM peak Symbol Number 121. RS EVM peak Subcarrier Number 122. RS EVM High rms (Average) 123. RS EVM High rms (Maximum) 124. RS EVM High peak (Average) 125. RS EVM High peak (Maximum) 126. RS EVM High peak Symbol Number 127. RS EVM High peak Subcarrier Number 128. RS EVM Low rms (Average) 129. RS EVM Low rms (Maximum) 130. RS EVM Low peak (Average) 131. RS EVM Low peak (Maximum) 132. RS EVM Low peak Symbol Number 133. RS EVM Low peak Subcarrier Number

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	134. SS EVM result valid (1 = valid / 0 = invalid) 135. SS EVM rms (Average) 136. SS EVM rms (Maximum) 137. SS EVM peak (Average) 138. SS EVM peak (Maximum) 139. SS EVM peak Symbol Number 140. SS EVM peak Subcarrier Number 141. SS EVM High rms (Average) 142. SS EVM High rms (Maximum) 143. SS EVM High peak (Average) 144. SS EVM High peak (Maximum) 145. SS EVM High peak Symbol Number 146. SS EVM High peak Subcarrier Number 147. SS EVM Low rms (Average) 148. SS EVM Low rms (Maximum) 149. SS EVM Low peak (Average) 150. SS EVM Low peak (Maximum) 151. SS EVM Low peak Symbol Number 152. SS EVM Low peak Subcarrier Number 153. PBCH EVM result valid (1 = valid/0 = invalid) 154. PBCH EVM rms (Average) 155. PBCH EVM rms (Maximum) 156. PBCH EVM peak (Average) 157. PBCH EVM peak (Maximum) 158. PBCH EVM peak Symbol Number 159. PBCH EVM peak Subcarrier Number 160. PBCH EVM High rms (Average) 161. PBCH EVM High rms (Maximum) 162. PBCH EVM High peak (Average) 163. PBCH EVM High peak (Maximum) 164. PBCH EVM High peak Symbol Number 165. PBCH EVM High peak Subcarrier Number 166. PBCH EVM Low rms (Average) 167. PBCH EVM Low rms (Maximum) 168. PBCH EVM Low peak (Average) 169. PBCH EVM Low peak (Maximum) 170. PBCH EVM Low peak Symbol Number 171. PBCH EVM Low peak Subcarrier Number

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	172. PCFICH EVM result valid (1 = valid / 0 = invalid) 173. PCFICH EVM rms (Average) 174. PCFICH EVM rms (Maximum) 175. PCFICH EVM peak (Average) 176. PCFICH EVM peak (Maximum) 177. PCFICH EVM peak Symbol position 178. PCFICH EVM peak Subcarrier position 179. PCFICH EVM High rms (Average) 180. PCFICH EVM High rms (Maximum) 181. PCFICH EVM High peak (Average) 182. PCFICH EVM High peak (Maximum) 183. PCFICH EVM High peak Symbol position 184. PCFICH EVM High peak Subcarrier position 185. PCFICH EVM Low rms (Average) 186. PCFICH EVM Low rms (Maximum) 187. PCFICH EVM Low peak (Average) 188. PCFICH EVM Low peak (Maximum) 189. PCFICH EVM Low peak Symbol position 190. PCFICH EVM Low peak Subcarrier position 191. PHICH EVM result valid (1 = valid/0 = invalid) 192. PHICH EVM rms (Average) 193. PHICH EVM rms (Maximum) 194. PHICH EVM peak (Average) 195. PHICH EVM peak (Maximum) 196. PHICH EVM peak Symbol position 197. PHICH EVM peak Subcarrier position 198. PHICH EVM High rms (Average) 199. PHICH EVM High rms (Maximum) 200. PHICH EVM High peak (Average) 201. PHICH EVM High peak (Maximum) 202. PHICH EVM High peak Symbol position 203. PHICH EVM High peak Subcarrier position 204. PHICH EVM Low rms (Average) 205. PHICH EVM Low rms (Maximum) 206. PHICH EVM Low peak (Average) 207. PHICH EVM Low peak (Maximum) 208. PHICH EVM Low peak Symbol position 209. PHICH EVM Low peak Subcarrier position

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	210. P-SS EVM result valid (1 = valid / 0 = invalid) 211. P-SS EVM rms (Average) 212. P-SS EVM rms (Maximum) 213. P-SS EVM peak (Average) 214. P-SS EVM peak (Maximum) 215. P-SS EVM peak Symbol position 216. P-SS EVM peak Subcarrier position 217. P-SS EVM rms High (Average) 218. P-SS EVM rms High (Maximum) 219. P-SS EVM peak High (Average) 220. P-SS EVM peak High (Maximum) 221. P-SS EVM peak High Symbol position 222. P-SS EVM peak High Subcarrier position 223. P-SS EVM rms Low(Average) 224. P-SS EVM rms Low(Maximum) 225. P-SS EVM peak Low (Average) 226. P-SS EVM peak Low (Maximum) 227. P-SS EVM peak Low Symbol position 228. P-SS EVM peak Low Subcarrier position 229. S-SS EVM result valid (1 = valid / 0 = invalid) 230. S-SS EVM rms (Average) 231. S-SS EVM rms (Maximum) 232. S-SS EVM peak (Average) 233. S-SS EVM peak (Maximum) 234. S-SS EVM peak Symbol position 235. S-SS EVM peak Subcarrier position 236. S-SS EVM rms High (Average) 237. S-SS EVM rms High (Maximum) 238. S-SS EVM peak High (Average) 239. S-SS EVM peak High (Maximum) 240. S-SS EVM peak High Symbol position 241. S-SS EVM peak High Subcarrier position 242. S-SS EVM rms Low(Average) 243. S-SS EVM rms Low(Maximum) 244. S-SS EVM peak Low (Average) 245. S-SS EVM peak Low (Maximum) 246. S-SS EVM peak Low Symbol position 247. S-SS EVM peak Low Subcarrier position 248. PDSCH 256QAM EVM result valid (1 = valid / 0 = invalid) 249. PDSCH 256QAM EVM rms (Average) 250. PDSCH 256QAM EVM rms (Maximum) 251. PDSCH 256QAM EVM peak (Average) 252. PDSCH 256QAM EVM peak (Maximum) 253. PDSCH 256QAM EVM peak Symbol Number 254. PDSCH 256QAM EVM peak Subcarrier Number 255. PDSCH 256QAM EVM High rms (Average)

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	256. PDSCH 256QAM EVM High rms (Maximum) 257. PDSCH 256QAM EVM High peak (Average) 258. PDSCH 256QAM EVM High peak (Maximum) 259. PDSCH 256QAM EVM High peak Symbol Number 260. PDSCH 256QAM EVM High peak Subcarrier Number 261. PDSCH 256QAM EVM Low rms (Average) 262. PDSCH 256QAM EVM Low rms (Maximum) 263. PDSCH 256QAM EVM Low peak (Average) 264. PDSCH 256QAM EVM Low peak (Maximum) 265. PDSCH 256QAM EVM Low peak Symbol Number 266. PDSCH 256QAM EVM Low peak Subcarrier Number ***Note:*** When Result Valid is invalid, the measurement result is regarded as an unmeasured result.

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: 1 to 2 × N Constellation 1. I-phase data of the 0th subcarrier 2. Q-phase data of the 0th subcarrier 3. I-phase data of the 1st subcarrier 4. Q-phase data of the 1st subcarrier … 2 × N–1. I-phase data of the (N–1)th subcarrier 2 × N. Q-phase data of the (N–1)th subcarrier The constellation data for the symbol set by Symbol Number is returned.
4	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N EVM vs Subcarrier (rms) 1. EVM (rms) of the 0th subcarrier 2. EVM (rms) of the 1st subcarrier … N. EVM (rms) of the (N–1)th subcarrier ***Note:*** Executable even when EVM vs Subcarrier is not selected for Graph window.
5	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N EVM vs Subcarrier (peak) 1. EVM (peak) of the 0th subcarrier 2. EVM (peak) of the 1st subcarrier … N. EVM (peak) of the (N–1)th subcarrier ***Note:*** Executable even when EVM vs Subcarrier is not selected for Graph window.
6	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M EVM vs Symbol (rms) 1. EVM (rms) of the 0th symbol 2. EVM (rms) of the 1st symbol … M. EVM (rms) of the (M–1)th symbol ***Note:*** Executable even when EVM vs Symbol is not selected for Graph window.

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: 1 to M EVM vs Symbol (peak) 1. EVM (peak) of the 0th symbol 2. EVM (peak) of the 1st symbol … M. EVM (peak) of the (M–1)th symbol ***Note:*** Executable even when EVM vs Symbol is not selected for Graph window.
8	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Spectral flatness amplitude 1. Spectral flatness amplitude of the 0th subcarrier 2. Spectral flatness amplitude of the 1st subcarrier … N. Spectral flatness amplitude of the (N–1)th subcarrier ***Note:*** Executable even when Spectral Flatness Amplitude is not selected for Graph window.
9	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N–2 Spectral flatness differential amplitude 1. Spectral flatness differential amplitude of the 1st subcarrier 2. Spectral flatness differential amplitude of the 2nd subcarrier … N–2. Spectral flatness differential amplitude of the (N–2)th subcarrier ***Note:*** Executable even when Spectral Flatness Difference Amplitude is not selected for Graph window.
10	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Spectral flatness phase 1. Spectral flatness phase of the 0th subcarrier 2. Spectral flatness phase of the 1st subcarrier … N. Spectral flatness phase of the (N–1)th subcarrier ***Note:*** Executable even when Spectral Flatness Phase is not selected for Graph window.

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: 1 to N–2 Spectral flatness group delay 1. Spectral flatness group delay of the 1st subcarrier 2. Spectral flatness group delay of the 2nd subcarrier … N–2. Spectral flatness group delay of the (N–2)th subcarrier ***Note:*** Executable even when Spectral Flatness Group Delay is not selected for Graph window.
12	A/B	1 to m Resource Block Result Valid (PDSCH) 1 = valid : QPSK/16QAM/64QAM/256QAM 0 = invalid : DTX ***Note:*** Returns data within the range determined by Starting Subframe Number and Measurement Interval. If Storage Mode is set to Average or Average&Max, the result of the last measurement is returned.

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: EVM (rms) vs Resource Block x = Number of valid resource blocks for the specified channel bandwidth y = Starting Subframe Number z = Measurement Interval –1 If Virtual Resource Block Type is Localized: 1. EVM (rms) of resource block 0 in subframe y 2. EVM (rms) of resource block 1 in subframe y … x. EVM (rms) of resource block (x – 1) in subframe y x + 1. EVM (rms) of resource block 0 in subframe (y + 1) … 2 × x. EVM (rms) of resource block (x – 1) in subframe (y + 1) … m. EVM (rms) of resource block (x – 1) in subframe (y + z) If Virtual Resource Block Type is Distributed: 1. EVM (rms) of resource block 0 in slot (y × 2) 2. EVM (rms) of resource block 1 in slot (y × 2) … x. EVM (rms) of resource block (x – 1) in slot (y × 2) x + 1. EVM (rms) of resource block 0 in slot (y × 2 + 1) … 4 × x. EVM (rms) of resource block (x – 1) in slot (y × 2 + 1) … m. EVM (rms) of resource block (x – 1) in slot ((y + z) × 2 – 1) ***Note:*** Data is returned within the range that is determined by the Starting Subframe Number and Measurement Interval settings. The units of the response are determined to be % or dB according to the EVM Unit setting. Measurement is not performed for the resource blocks for which Resource Block Result Valid is invalid. If Storage Mode is Average or Average&Max, the result of the last measurement is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
14	A/B	Responses are returned with comma-separated value formats in the following order: 1 to m (= x × y) Power vs Resource Block Valid number of reference blocks for x = channel bandwidth y = Starting Subframe Number z = Measurement Interval–1 1. Power of the 0th reference block in Subframe y 2. Power of the 1st reference block in Subframe y … If Virtual Resource Block Type is Localized: x. Power of the (x–1)th reference block in Subframe y x+1. Power of the 0th reference block in Subframe y+1 … 2 × x. Power of the (x–1)th reference block in Subframe y+1 … m. Power of the (x–1)th reference block in Subframe y+z If Virtual Resource Block Type is Distributed: 1. Power of resource block 0 in slot (y × 2) 2. Power of resource block 1 in slot (y × 2) … x. Power of resource block (x – 1) in slot (y × 2) x + 1. Power of resource block 0 in slot (y × 2 + 1) … 4 × x. Power of resource block (x – 1) in slot (y × 2 + 1) … m. Power of resource block (x – 1) in slot ((y + z) × 2 – 1) ***Note:*** Returns data within the range determined by Starting Subframe Number and Measurement Interval. The unit of the response is always dB. The value of Reference Block for which Resource Block Result Valid is invalid is regarded as an unmeasured result. If Storage Mode is set to Average or Average&Max, the result of the last measurement is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
15	A/B	Responses are returned with comma-separated value formats in the following order: 1 to m (= x × y) Modulation vs Resource Block Valid number of reference blocks for x = channel bandwidth y = Starting Subframe Number z = Measurement Interval–1 If Virtual Resource Block Type is Localized: 1. Modulation of the 0th reference block Subframe y 2. Modulation of the 1st reference block in Subframe y … x. Modulation of the (x–1)th reference block in Subframe y x+1. Modulation of the 0th reference block in Subframe y+1 … 2 × x. Modulation of the (x–1)th reference block in Subframe y+1 … m. Modulation of the (x–1)th reference block in Subframe y+z If Virtual Resource Block Type is Distributed: 1. Modulation of reference block 0 in slot (y × 2) 2. Modulation of reference block 1 in slot (y ×× 2) … x. Modulation of resource block (x – 1) in slot (y × 2) x + 1. Modulation of resource block 0 in slot (y × 2 + 1) … 4 × x. Modulation of resource block (x – 1) in slot (y × 2 + 1) … m. Modulation of resource block (x – 1) in slot ((y + z) × 2 – 1) ***Note:*** Returns data within the range determined by Starting Subframe Number and Measurement Interval. The response is QPSK, 16Q, 64Q or 256Q. DTX is returned for resource blocks for which Resource Block Result Valid is invalid. If Storage Mode is set to Average or Average&Max, the result of the last measurement is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
16	A/B	Responses are returned with comma-separated value formats in the following order: 1 to (2 × Element Number + 1) PDSCH Constellation 1. Number of valid results (Number of PDSCs with valid measurement results) 2. I-phase data of the 0st PDSCH 3. Q-phase data of PDSCH number 0 4. I-phase data of the 1st PDSCH 5. Q-phase data of PDSCH number 1 … 2 × Element Number. Element Number – I-phase data of PDSCH number 1 2 × Element Number + 1. Element Number – Q-phase data of PDSCH number 1 ***Note:*** When PDSCH ALL EVM result valid is invalid, measurement is not performed. Data is returned in the range determined by Resource Block Number and either Subframe Number or Slot Number.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
17	A/B	Responses are returned with comma-separated value formats in the following order: 1 to (2 × Element Number + 1) PDSCH Constellation 1. Number of valid results (Number of PDCCHs with valid measurement results) 2. I-phase data of PDSCH number 0 3. Q-phase data of PDCCH number 0 4. I-phase data of PDSCH number 1 5. Q-phase data of PDCCH number 1 … 2 × Element Number. Element Number – I-phase data of SS number 1 2 × Element Number + 1. Element Number – Q-phase data of SS number 1 ***Note*:** When PDSCH EVM result valid is invalid, measurement is not performed. Constellation PDSCH returns data of the subframe set by the Starting Subframe Number and Measurement Interval setting.
18	A/B	Responses are returned with comma-separated value formats in the following order: 1 to (2 × Element Number + 1) PDSCH Constellation 1. Number of valid results (Number of RSs with valid measurement results) 2. I-phase data of RS number 0 3. Q-phase data of RS number 0 4. I-phase data of RS number 1 5. Q-phase data of RS number 1 … 2 × Element Number. Element Number – I-phase data of RS number 1 2 × Element Number + 1. Element Number – Q-phase data of RS number 1 ***Note*:** When RS EVM result valid is invalid, measurement is not performed. Data is returned within the range that is determined by the Starting Subframe Number and Measurement Interval settings.

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>19</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to (2 × Element Number + 1) SS Constellation
1. Number of valid results
(Number of SSs with valid measurement results)
2. I-phase data of SS number 0
3. Q-phase data of SS number 0
4. I-phase data of SS number 1
5. Q-phase data of SS number 1
…
2 × Element Number.
Element Number – I-phase data of SS number 1
2 × Element Number + 1.
Element Number–Q-phase data of SS number 1
Note:
When SS EVM result valid is invalid, measurement is not performed. Data is returned within the range that is determined by the Starting Subframe Number and Measurement Interval settings.</td></tr>
<tr><td>20</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to (2 × Element Number + 1) PBCH Constellation
1. Number of valid results
(Number of PBCHs with valid measurement results)
2. I-phase data of PBCH number 0
3. Q-phase data of PBCH number 0
4. I-phase data of PBCH number 1
5. Q-phase data of PBCH number 1
…
2 × Element Number.
Element Number – I-phase data of PBCH number 1
2 × Element Number + 1.
Element Number – Q-phase data of PBCH number 1
Note:
When PBCH EVM result valid is invalid, measurement is not performed. Data is returned within the range that is determined by the Starting Subframe Number and Measurement Interval settings.</td></tr>
</table>

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
21	A/B	Responses are returned with comma-separated value formats in the following order: 1. Power of Slot number 0 (Average) 2. Power of Slot number 1 (Average) … 19. Power of Slot number 18 (Average) 20. Power of Slot number 19 (Average) 21. Power of Slot number 0 (Maximum) 22. Power of Slot number 1 (Maximum) … 39. Power of Slot number 18 (Maximum) 40. Power of Slot number 19 (Maximum) ***Note:*** Measurement is not performed for outside of the range set by Measurement Interval.
22	A/B	1. RS Power (Average) [dBm] 2. RS Power (Maximum) [dBm] 3. P-SS Power (Average) [dBm] 4. P-SS Power (Average) [dB] 5. P-SS Power (Maximum) [dBm] 6. P-SS Power (Maximum) [dB] 7. S-SS Power (Average) [dBm] 8. S-SS Power (Average) [dB] 9. S-SS Power (Maximum) [dBm] 10. S-SS Power (Maximum) [dB] 11. PBCH Power (Average) [dBm] 12. PBCH Power (Average) [dB] 13. PBCH Power (Maximum) [dBm] 14. PBCH Power (Maximum) [dB] 15. PDCCH Power (Average) [dBm] 16. PDCCH Power (Average) [dB] 17. PDCCH Power (Maximum) [dBm] 18. PDCCH Power (Maximum) [dB] 19. PCFICH Power (Average) [dBm] 20. PCFICH Power (Average) [dB] 21. PCFICH Power (Maximum) [dBm] 22. PCFICH Power (Maximum) [dB] 23. PHICH Power (Average) [dBm] 24. PHICH Power (Average) [dB] 25. PHICH Power (Maximum) [dBm] 26. PHICH Power (Maximum) [dB] 27. Cell ID (Last frame value in Storage mode) 28. Number of PDCCH Symbols (Last frame value in Storage mode)

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
23	A/B	Responses are returned with comma-separated value formats in the following order: EVM (Peak) vs Resource Block Valid number of reference blocks for x = channel bandwidth y = Starting Subframe Number z = Measurement Interval – 1 If Virtual Resource Block Type is Localized: 1. Subframe y, EVM of the 0th resource block (Peak) 2. Subframe y, EVM of the 1st resource block (Peak) … x. Subframe y, EVM of the x-1th resource block (Peak) x + 1. Subframe y + 1, EVM of the 0th resource block (Peak) … 2 × x. Subframe y +1, EVM of the x-1th resource block (Peak) … m. Subframe y + z, EVM of the x-1th resource block (Peak) If Virtual Resource Block Type is Distributed: 1. EVM (Peak) of resource block 0 in slot (y × 2) 2. EVM (Peak) of resource block 1 in slot (y × 2) … x. EVM (Peak) of resource block (x – 1) in slot (y × 2) x + 1. EVM (Peak) of resource block 0 in slot (y × 2 + 1) … 4 × x. EVM (Peak) of resource block (x – 1) in slot (y × 2 + 1) … m. Modulation of resource block (x – 1) in slot ((y + z) × 2 – 1) ***Note:*** Returns data within the range determined by Starting Subframe Number and Measurement Interval. The unit of the response depends on the setting of EVM Unit (% or dB). Resource blocks for which Resource Block Result Valid is invalid are not measured. If Storage Mode is set to Average or Average&Max, the result of the last measurement is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
24	A/B	Responses are returned with comma-separated value formats in the following order: 1. Number of valid results (Number of PCFICHs with valid measurement results) 2. I-phase data of the 0st PCFICH 3. Q-phase data of the 0st PCFICH 4. I-phase data of the 1st PCFICH 5. Q-phase data of the 1st PCFICH … 2 × Element Number. Element Number – I-phase data of PCFICH number 1 2 × Element Number + 1. Element Number – Q-phase data of PCFICH number 1 ***Note:*** When PCFICH EVM result valid is invalid, measurement is not performed. Data is returned within the range that is determined by the Starting Subframe Number and Measurement Interval settings.
25	A/B	Responses are returned with comma-separated value formats in the following order: 1. Number of valid results (Number of PHICHs with valid measurement results) 2. I-phase data of the 0th PHICH 3. Q-phase data of the 0th PHICH 4. I-phase data of the 1st PHICH 5. Q-phase data of the 1st PHICH … 2 × Element Number. Element Number-I-phase data of PHICH number 1 2 × Element Number +1. Element Number-Q-phase data of PHICH number 1 ***Note***: If PHICH EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
26	A/B	Responses are returned with comma-separated value formats in the following order: The data is in the binary format. y = Starting Subframe Number z = Measurement Interval – 1 1. CFI codeword of subframe y 2. CFI codeword of subframe y + 1 … 9. CFI codeword of subframe y + z – 1 10. CFI codeword of subframe y + z ***Note*:** If PCFICH EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.
27	A/B	Responses are returned with comma-separated value formats in the following order: Response 0 = Off/1 = On 1. PHICH On/Off of subframe 0, Group 0, and Sequence Index 0 2. PHICH On/Off of subframe 0, Group 0, and Sequence Index 1 … 8. PHICH On/Off of subframe 0, Group 0, and Sequence Index 7 9. PHICH On/Off of subframe 0, Group 1, and Sequence Index 0 10. PHICH On/Off of subframe 0, Group 1, and Sequence Index 1 … 8 × N. PHICH On/Off of subframe 0, Group N-1, and Sequence Index 7 8 × N + 1. PHICH On/Off of subframe 1, Group 0, and Sequence Index 0 8 × N + 2. PHICH On/Off of subframe 1, Group 0, and Sequence Index 1 … 80 × N. PHICH On/Off of subframe 9, Group N – 1, and Sequence Index 7 ***Note*:** N is the number of PHICH groups determined by Channel Bandwidth and Ng. If PHICH EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
28	A/B	Responses are returned with comma-separated value formats in the following order: 1. PHICH Power (Average) of subframe 0, group 0, and sequence index 0 2. PHICH Power (Maximum) of subframe 0, group 0, and sequence index 0 3. PHICH Power (Average) of subframe 0, group 0, and sequence index 1 4. PHICH Power (Maximum) of subframe 0, group 0, and sequence index 1 … 16. PHICH Power (Maximum) of subframe 0, group 0, and sequence index 7 17. PHICH Power (Average) of subframe 0, group 1, and sequence index 0 18. PHICH Power (Maximum) of subframe 0, group 1, and sequence index 0 … 16 × N. PHICH Power (Maximum) of subframe 0, group N – 1, and sequence index 7 16 × N + 1. PHICH Power (Average) of subframe 1, group 0, and sequence index 0 16 × N + 2. PHICH Power (Maximum) of subframe 1, group 0, and sequence index 1 … 160 × N. PHICH Power (Maximum) of subframe 9, group N – 1, and sequence index 7 ***Note:*** N indicates the number of PHICH groups determined by Channel Bandwidth and Ng. If PHICH EVM result valid is invalid, measurement is not performed.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
29	A/B	Responses are returned with comma-separated value formats in the following order: 1. PHICH HI Codeword of subframe 0, Group 0, and Sequence Index 0 2. PHICH HI Codeword of subframe 0, Group 0, and Sequence Index 1 ... 8. PHICH HI Codeword of subframe 0, Group 0, and Sequence Index 7 9. PHICH HI Codeword of subframe 0, Group 1, and Sequence Index 0 10. PHICH HI Codeword of subframe 0, Group 1, and Sequence Index 1 ... 8 × N. PHICH HI Codeword of subframe 0, Group N–1, and Sequence Index 7 8 × N + 1. PHICH HI Codeword of subframe 1, Group 0, and Sequence Index 0 8 × N + 2. PHICH HI Codeword of subframe 1, Group 0, and Sequence Index 1 ... 80 × N. PHICH HI Codeword of subframe 9, Group N – 1, and Sequence Index 7 ***Note:*** N is the number of PHICH groups determined by Channel Bandwidth and Ng. If PHICH EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.
30	A/B	Responses are returned with comma-separated value formats in the following order: 1 to (2 × Element Number + 1) P-SS Constellation 1. Number of valid results (Number of P-SS with valid measurement results) 2. I-phase data of the 0th P-SS 3. Q-phase data of the 0th P-SS 4. I-phase data of the 1st P-SS 5. Q-phase data of the 1st P-SS ... 2 × Element Number. Element Number – I-phase data of P-SS number 1 2 × Element Number + 1. Element Number – Q-phase data of P-SS number 1 ***Note:*** If P-SS EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
31	A/B	Responses are returned with comma-separated value formats in the following order: 1 to (2 × Element Number + 1) S-SS Constellation 1. Number of valid results (Number of P-SS with valid measurement results) 2. I-phase data of the 0th S-SS 3. Q-phase data of the 0th S-SS 4. I-phase data of the 1st S-SS 5. Q-phase data of the 1st S-SS … 2 × Element Number. Element Number – I-phase data of S-SS number 1 2 × Element Number + 1. Element Number – Q-phase data of S-SS number 1 ***Note*:** If S-SS EVM result valid is invalid, measurement is not performed. Data within the range determined by Starting Subframe Number and Measurement Interval is returned.
32	A/B	Responses are returned with comma-separated value formats in the following order: 1. Number of PDCCH Symbols of subframe 0 2. Number of PDCCH Symbols of subframe 1 … 10. Number of PDCCH Symbols of subframe 9
33	A/B	Responses are returned with comma-separated value formats in the following order: 1. OSTP of subframe 0 (OFDM Symbol Tx Power)(Average) [dBm] 2. OSTP of subframe 0 (Maximum)[dBm] … 19. OSTP of subframe 9 (Average) [dBm] 20. OSTP of subframe 9 (Maximum)[dBm] 21. Average OSTP between measurement intervals (Average) [dBm] 22. Average OSTP between measurement intervals (Maximum) [dBm]
34	A/B	Responses are returned with comma-separated value formats in the following order: 1. RS Power of subframe 0 (Average) [dBm] 2. RS Power of subframe 0 (Maximum)[dBm] … 19. RS Power of subframe 9 (Average) [dBm] 20. RS Power of subframe 9 (Maximum) [dBm] 21. Average RS power between measurement intervals (Average) [dBm] 22. Average RS Power between measurement intervals (Maximum) [dBm]

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: 1. RS boosting, $P_B = E_B/E_A$ of subframe 0 (Average) 2. RS boosting, $P_B = E_B/E_A$ of subframe 0 (Maximum) … 19. RS boosting, $P_B = E_B/E_A$ of subframe 9 (Average) 20. RS boosting, $P_B = E_B/E_A$ of subframe 9 (Maximum) 21. RS boosting, $P_B = E_B/E_A$ between Measurement Interval (Average) 22. RS boosting, $P_B = E_B$/EA between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.
36	A/B	Responses are returned with comma-separated value formats in the following order: 1. P-SS EPRE / E_{RS} [dB] of subframe 0 (Average) 2. P-SS EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. P-SS EPRE / E_{RS} [dB] of subframe 9 (Average) 20. P-SS EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. P-SS EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. P-SS EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.
37	A/B	Responses are returned with comma-separated value formats in the following order: 1. S-SS EPRE / E_{RS} [dB] of subframe 0 (Average) 2. S-SS EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. S-SS EPRE / E_{RS} [dB] of subframe 9 (Average) 20. S-SS EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. S-SS EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. S-SS EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
38	A/B	Responses are returned with comma-separated value formats in the following order: 1. PBCH EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PBCH EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PBCH EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PBCH EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. PBCH EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. PBCH EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.
39	A/B	Responses are returned with comma-separated value formats in the following order: 1. PCFICH EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PCFICH EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PCFICH EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PCFICH EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. PCFICH EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. PCFICH EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.
40	A/B	Responses are returned with comma-separated value formats in the following order: 1. PHICH EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PHICH EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PHICH EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PHICH EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. PHICH group EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. PHICH group EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
41	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDCCH REG EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDCCH REG EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDCCH REG EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDCCH REG EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. PDCCH REG EPRE / E_{RS} [dB] between Measurement Interval (Average) 22. Average PDCCH REG EPRE / E_{RS} [dB] between Measurement Interval (Maximum) ***Note:*** Available when Test Model is not Off.
42	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH QPSK boosted EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDSCH QPSK boosted EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDSCH QPSK boosted EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDSCH QPSK boosted EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.
43	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH QPSK de-boosted EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDSCH QPSK de-boosted EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDSCH QPSK de-boosted EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDSCH QPSK de-boosted EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.

Table 2.8-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
44	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH 16QAM boosted EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDSCH 16QAM boosted EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDSCH 16QAM boosted EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDSCH 16QAM boosted EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.
45	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH 16QAM de-boosted EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDSCH 16QAM de-boosted EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDSCH 16QAM de-boosted EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDSCH 16QAM de-boosted EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.
46	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH 64QAM boosted EPRE / E_{RS} [dB] of subframe 0 (Average) 2. PDSCH 64QAM boosted EPRE / E_{RS} [dB] of subframe 0 (Maximum) … 19. PDSCH 64QAM boosted EPRE / E_{RS} [dB] of subframe 9 (Average) 20. PDSCH 64QAM boosted EPRE / E_{RS} [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.

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: 1. PDSCH 64QAM de-boosted EPRE / ERS [dB] of subframe 0 (Average) 2. PDSCH 64QAM de-boosted EPRE / ERS [dB] of subframe 0 (Maximum) … 19. PDSCH 64QAM de-boosted EPRE / ERS [dB] of subframe 9 (Average) 20. PDSCH 64QAM de-boosted EPRE / ERS [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.
48	A/B	Responses are returned with comma-separated value formats in the following order: 1. Frequency Error [Hz] of subframe 0 (Average) 2. Frequency Error [Hz] of subframe 0 (Maximum) … 19. Frequency Error [Hz] of subframe 9 (Average) 20. Frequency Error [Hz] of subframe 9 (Maximum)
49	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH 256QAM boosted EPRE / ERS [dB] of subframe 0 (Average) 2. PDSCH 256QAM boosted EPRE / ERS [dB] of subframe 0 (Maximum) … 19. PDSCH 256QAM boosted EPRE / ERS [dB] of subframe 9 (Average) 20. PDSCH 256QAM boosted EPRE / ERS [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.
50	A/B	Responses are returned with comma-separated value formats in the following order: 1. PDSCH 256QAM de-boosted EPRE / ERS [dB] of subframe 0(Average) 2. PDSCH 256QAM de-boosted EPRE / ERS [dB] of subframe 0(Maximum) … 19. PDSCH 256QAM de-boosted EPRE / ERS [dB] of subframe 9 (Average) 20. PDSCH 256QAM de-boosted EPRE / ERS [dB] of subframe 9 (Maximum) 21. –999.0 22. –999.0 ***Note:*** Available when Test Model is not Off.

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 2.8-3 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 <scale>
	:DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel?
Scale–Flatness	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel <scale>
	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?
Trace Mode	:DISPlay:EVM[:VIEW]:SELect EVSubcarrier|EVSYmbol|FLATness|PVRB|EVRB|SUMMary|REMap
	: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?
Marker - Symbol Number	:CALCulate:EVM:WINDow|2:SYMBol:NUMBer <integer>
	:CALCulate:EVM:WINDow|2:SYMBol:NUMBer?
Marker - Subcarrier Number	:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer>
	:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?
Subframe Number	:CALCulate:EVM:WINDow5:SUBFrame:NUMBer <integer>
	:CALCulate:EVM:WINDow5:SUBFrame:NUMBer?
Slot Number	:CALCulate:EVM:WINDow5|6:SLOT:NUMBer <integer>
	:CALCulate:EVM:WINDow5|6:SLOT: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?

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?
	:CALCulate:EVM:MARKer:CHANnel?
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. When n = 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15, the number of responses differs according to the setting.

Number of responses (N) when n = 4, 5, 8, or 10:

1200 (Channel Bandwidth: 20 MHz)
900 (Channel Bandwidth: 15 MHz)
600 (Channel Bandwidth: 10 MHz)
300 (Channel Bandwidth: 5 MHz)
180 (Channel Bandwidth: 3 MHz)
72 (Channel Bandwidth: 1.4 MHz)

Number of responses when n = 3:

2 × N

Number of responses (M) when n = 6 or 7:

Measurement interval × 14 symbols

Number of responses when n = 9 or 11:

N – 2

Number of responses (m) when n = 12, 13, 14, 15, or 23:
If Virtual Resource Block Type is Localized:

100 × Measurement Interval (Channel Bandwidth: 20 MHz)
75 × Measurement Interval (Channel Bandwidth: 15 MHz)
50 × Measurement Interval (Channel Bandwidth: 10 MHz)
25 × Measurement Interval (Channel Bandwidth: 5 MHz)
15 × Measurement Interval (Channel Bandwidth: 3 MHz)
6 × Measurement Interval (Channel Bandwidth: 1.4 MHz)

If Virtual Resource Block Type is Distributed:

200 × Measurement Interval (Channel Bandwidth: 20 MHz)
150 × Measurement Interval (Channel Bandwidth: 15 MHz)
100 × Measurement Interval (Channel Bandwidth: 10 MHz)
50 × Measurement Interval (Channel Bandwidth: 5 MHz)
30 × Measurement Interval (Channel Bandwidth: 3 MHz)
12 × Measurement Interval (Channel Bandwidth: 1.4 MHz)

When n = 15:

QPSK	Modulation is QPSK
16Q	Modulation is 16QAM
64Q	Modulation is 64QAM
DTX	Not transmitted

When n = 16 to 20:

The value of the first response returns the number of channels with valid measurement results. The number of channels with valid measurement results differs depending on the settings of each channel, band, antenna, Detail Setting, etc.
The responses with invalid measurement results return an unmeasured value.

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.

The unit of the read EVM value depends on the setting of EVM Unit.

Example of Use

To query the result of Modulation measurement.

```
FETC:EVM?
> 5.20,1.03,1,0.53,38,3,2.34,…
```

: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

Details

When Capture Time Auto is set to Off, the capture time length must be 2 frames or more to perform measurement in Storage mode.

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
Resolution	1
Default	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
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|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|5|6|7:TRACe:Y[:SCALe]:SPACing <mode>
```

Parameter

`<mode>`	Scale mode
`LINear`	% scale
`LOGarithmic`	dB scale
`PERCent`	% scale (Default)
`DB`	dB scale

Details

This command is not available when Trace Mode is set to Spectral Flatness.

Example of Use

To set the unit for EVM to dB scale.

```
DISP:EVM:WIND2:TRAC:Y:SPAC DB
```

:DISPlay:EVM[:VIEW]:WINDow2|3|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|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 < scale>

Scale-EVM

Function

This command sets the vertical axis scale of the graph in which the vertical axis (Y) indicates EVM. The unit depends on the setting of EVM Unit.

Command

```
:DISPlay:EVM[:VIEW]:WINDow2|3|6:TRACe:Y[:SCALe]:RLEVel
<scale>
```

Parameter

Range of vertical axis scale when EVM Unit = %

Range	1 to 100
Resolution	1
Suffix code	None
Default	5

Range of vertical axis scale when EVM Unit = dB

Range	–60 to 0
Resolution	1
Suffix code	None
Default	–40

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 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

```
<integer>
```

Parameter

Range of vertical axis scale when EVM Unit = %

Range	1 to 100
Resolution	1

Range of vertical axis scale when EVM Unit = dB

Range	–60 to 0
Resolution	1

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 <scale>

Scale–Flatness

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
<scale>
```

Parameter

Range of vertical axis scale when Flatness Type = Amplitude

Range	1.0 to 100.0
Resolution	0.1
Suffix code	None
Default	10.0

Range of vertical axis scale when Flatness Type = Difference Amplitude

Range	0.1 to 10.0
Resolution	0.1
Suffix code	None
Default	1.0

Range of vertical axis scale when Flatness Type = Phase

Range	1.0 to 180.0
Resolution	0.1
Suffix code	None
Default	10.0

Range of vertical axis scale when Flatness Type = Group Delay

Range	1.0 to 10000.0
Resolution	0.1
Suffix code	None
Default	50.0

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–Flatness 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

```
<integer>
```

Parameter

Range of vertical axis scale when Flatness Type = Amplitude

Range	1.0 to 100.0
Resolution	0.1

Range of vertical axis scale when Flatness Type = Difference Amplitude

Range	0.1 to 10.0
Resolution	0.1

Range of vertical axis scale when Flatness Type = Phase

Range	1.0 to 180.0
Resolution	0.1

Range of vertical axis scale when Flatness Type = Group Delay

Range	1.0 to 10000.0
Resolution	0.1

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|REMap

Trace Mode

Function

This command sets the result type to be displayed on the graph window.

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.
`REMap`	Displays RE Map.

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.
REM	Displays RE Map.

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.

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 to be analyzed, 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 to be analyzed, 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 Marker - Symbol Number

:CALCulate:EVM:WINDow1|2:SYMBol:NUMBer <integer>

Marker - Symbol Number

Function

This command sets the symbol number to be displayed in a constellation of graph.

Command

```
:CALCulate:EVM:WINDow1|2:SYMBol:NUMBer <integer>
```

Parameter

`<integer>`	Symbol number
Range	0 to (Measurement interval × 14 symbols) – 1
Resolution	1
Suffix code	None
Default	0

Example of Use

To set the display symbol number to 110.

```
CALC:EVM:WIND1:SYMB:NUMB 110
```

:CALCulate:EVM:WINDow1|2:SYMBol:NUMBer?

Marker - Symbol Number Query

Function

This command queries the symbol number displayed in a constellation of graph.

Query

`:CALCulate:EVM:WINDow1:SYMBol:NUMBer?`

Response

`<integer>`

Parameter

`<integer>`	Symbol number
Range	0 to (Measurement interval × 14 symbols) – 1
Resolution	1

Details

Use `:CALCulate:EVM:MARKer:SYMBol?` to query the symbol number to be displayed in a Power vs RB or EVM vs RB constellation.

Example of Use

To query the display symbol number.

```
CALC:EVM: WIND1:SYMB:NUMB?
> 110
```

2.8.12 Marker - Subcarrier Number

:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer>

Marker - Subcarrier Number

Function

This command sets the subcarrier number of the displayed constellation and graph.

Command

```
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <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
Suffix code	None
Default	0

Example of Use

To set the display subcarrier number to 110.

```
CALC:EVM:WIND3:SUBC:NUMB 110
```

:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?

Marker - Subcarrier Number Query

Function

This command queries the subcarrier number of displayed constellation and graph.

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 display subcarrier number.

```
CALC:EVM:WIND3:SUBC:NUMB?
> 110
```

2.8.13 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	Starting Subframe Number to (Starting Subframe Number + Measurement Interval–1)
Resolution	1
Suffix code	None
Default	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	Starting Subframe Number to (Starting Subframe Number + Measurement Interval– 1)
Resolution	1

Example of Use

To query the subframe number displayed for Power vs Resource Block.

```
CALC:EVM:WIND5:SUBF:NUMB?
> 1
```

2.8.14 SlotNumber

:CALCulate:EVM:WINDow5|6: SLOT:NUMBer <integer>

Slot Number

Function

This command sets the slot number to be displayed for Power vs Resource Block and EVM vs Resource Block.

Command

```
:CALCulate:EVM:WINDow5|6:SLOT:NUMBer <integer>
```

Parameter

`<integer>`	Subframe number to be displayed × 2
Range	Starting slot Number to (Starting slot Number + Measurement Interval) × 2 – 1
Resolution	1
Suffix code	None
Default	0

Example of Use

To set the slot number to be displayed for EVM vs Resource Block to 1.

```
CALC:EVM:WIND6:SLOT:NUMB 1
```

:CALCulate:EVM:WINDow5|6: SLOT:NUMBer?

Slot Number Query

Function

This command queries the slot number displayed for Power vs Resource Block and EVM vs Resource Block.

Query

```
:CALCulate:EVM:WINDow5|6:SLOT:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`	Slot number to be displayed
Range	Starting slot Number to (Starting slot Number + Measurement Interval – 1)
Resolution	1

Example of Use

To query the slot number displayed for EVM vs Resource Block.

```
CALC:EVM:WIND6:SLOT: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	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
```

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SCPI Device Message Details

:CALCulate:EVM:WINDow5|6:RBLock:NUMBer?

Resource Block Number Query

Function

This command queries the Resource Block number displayed for Power vs Resource Block and EVM 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 9
Resolution	1
Suffix code	None
Default	1

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 9
Resolution	1

Example of Use

To query the page number displayed for Summary.

```
DISP:EVM:WIND7:PAGE:NUMB?
> 1
```

2.8.17 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
```

2.8.18 Active Trace

:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom

Active Trace

Function

For the marker result query command `:CALCulate: EVM: MARKer: Y[:RMS]?`, this command sets the type of marker results to obtain.

Command

`:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom`

Parameter

`<mode>`	Marker result type to obtain
`CONStellation`	Coordinate Q of the constellation
`BOTTom`	Marker result for the displayed graph (default)

Example of Use

To set coordinate Q of the constellation as the marker result type to obtain.

```
CALC:EVM:MARK:ACT CONS
```

:CALCulate:EVM:MARKer:ACTive?

Active Trace Query

Function

This command queries the type of marker results to obtain.

Query

`:CALCulate:EVM:MARKer:ACTive?`

Response

`<mode>`

Parameter

`<mode>`	Marker result type to obtain
`CONS`	Coordinate Q of the constellation
`BOTT`	Marker result for the displayed graph

Example of Use

To query the type of marker results to obtain.

```
CALC:EVM:MARK:ACT?
> CONS
```

2.8.19 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 graphs other than Difference Amplitude and Group Delay:

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	0

Details

The marker position specified by this command does not apply to the subcarrier number of the constellation displayed on Power vs RB and EVM vs RB.

Example of Use

To set the position of the marker 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.

Command

```
:CALCulate:EVM:MARKer:SUBCarrier?
```

Response

```
<integer>
```

Parameter

`<integer>` Subcarrier number

Range for graphs other than Difference Amplitude and Group Delay:

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

For Power vs Resource Block and EVM vs Resource Block, the marker position on the constellation is returned as a subcarrier number.

Example of Use

To query the position of the marker 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 constellation or in the graph window as a symbol number.

Command

```
:CALCulate:EVM:MARKer:SYMBol <integer>
```

Parameter

`<integer>`	Symbol number
Range	0 to (Measurement interval × 14 symbols) – 1
Resolution	1
Suffix code	None
Default	0

Example of Use

To set the position of the marker 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 in the graph window as a symbol number.

Command

```
:CALCulate:EVM:MARKer:SYMBol?
```

Response

```
<integer>
```

Parameter

`<integer>`	Symbol number
Range	0 to (Measurement interval × 14 symbols) – 1
Resolution	1

Details

For Power vs Resource Block and EVM vs Resource Block, the marker position of Constellation is returned in a symbol number.

Example of Use

To query the marker position.

```
CALC:EVM:MARK:SYMB?
> 100
```

:CALCulate:EVM:MARKer:RELement <integer>

Marker Resource Element Number

Function

This command sets the marker position of 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 Max Resource Element
Resolution	1
Suffix code	None
Default	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 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 Max Resource Element
Resolution	1

Example of Use

To query the marker target of Constellation.

```
CALC:EVM:MARK:SYMB?
> 100
```

2.8.20 Marker Value

:CALCulate:EVM:MARKer:X?

Marker X Axis Value Query

Function

This command queries the X-coordinate value at the marker on the Constellation.

Query

```
:CALCulate:EVM:MARKer:X?
```

Response

```
<real>
```

Parameter

<real>	X-coordinate value at the marker on the Constellation

Details

This command is available when Trace Mode is set to Summary.
–999.0 is returned when measurement is not made or an error has occurred.

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

When Active Trace = Graph window
and Trace Mode = RE Map:

When EVM Unit = %	In % units
When EVM Unit = dB	In dB units

Details

–999.0 is returned if Trace Mode is Summary.
–999.0 is returned when measurement is not performed or an error has occurred.
Execute the following command to specify whether to query the Q coordinate of Constellation or the value at the marker at the bottom of the screen.

```
: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

–999.0 is returned if Trace Mode is not EVM vs Subcarrier or EVM vs Symbol. –999. 0 is returned when measurement is not made or an error has occurred.

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 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 if Trace Mode is not EVM vs Subcarrier, EVM vs Symbol, Power vs RB, or EVM vs RB.
–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 if Trace Mode is not EVM vs Subcarrier, EVM vs Symbol, Power vs RB, or EVM vs RB.

–999.0 is returned when no measurement is made or an error occurs.

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

–999.0 is returned if Trace Mode is not Power vs RB or EVM vs RB.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query the relative power value at the marker position.

```
CALC:EVM:MARK:POW?
> -20.00
```

: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 if Trace Mode is not Power vs RB or EVM vs RB.
–999.0 is returned when no measurement is made or an error occurs.

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
```

2.8.21 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: 1. Band #0 Measurement status 2. Band #0 Frequency Error (Average) [Hz] (resolution 0.01 Hz) 3. Band #0 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 4. Band #0 PDSCH EVM (Average) [%] (resolution 0.01 %) 5. Band #0 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 6. Band #0 Band Power (Average) [dBm] (resolution 0.01 dB) 7. Band #0 Band Power (Maximum) [dBm] (resolution 0.01 dB) 8. Band #0 Band Power (Minimum) [dBm] (resolution 0.01 dB) 9. Band #0 RS Power (Average) [dBm] (resolution 0.01 dB) 10. Band #0 RS Power (Maximum) [dBm] (resolution 0.01 dB) 11. Band #0 RS Power (Minimum) [dBm] (resolution 0.01 dB) 12. Band #0 OSTP Power (Average) [dBm] (resolution 0.01 dB) 13. Band #0 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 14. Band #0 OSTP Power (Minimum) [dBm] (resolution 0.01 dB) 15. –999.99 16. –999.99 17. –999.99 18. –999.99 19. –999.99 20. –999.99 21. –999.99 22. –999.99 23. –999.99 24. –999.99 25. –999.99 26. –999.99 27. –999.99 28. –999.99 29. –999.99 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 32. Band #1 Frequency Error (Average) [Hz] (resolution 0.01 Hz) 33. Band #1 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 34. Band #1 PDSCH EVM (Average) [%] (resolution 0.01 %) 35. Band #1 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 36. Band #1 Band Power (Average) [dBm] (resolution 0.01 dB) 37. Band #1 Band Power (Maximum) [dBm] (resolution 0.01 dB) 38. Band #1 Band Power (Minimum) [dBm] (resolution 0.01 dB) 39. Band #1 RS Power (Average) [dBm] (resolution 0.01 dB) 40. Band #1 RS Power (Maximum) [dBm] (resolution 0.01 dB) 41. Band #1 RS Power (Minimum) [dBm] (resolution 0.01 dB) 42. Band #1 OSTP Power (Average) [dBm] (resolution 0.01 dB) 43. Band #1 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 44. Band #1 OSTP Power (Minimum) [dBm] (resolution 0.01 dB) 45. –999.99 46. –999.99 47. –999.99 48. –999.99 49. –999.99 50. –999.99 51. –999.99 52. –999.99 53. –999.99 54. –999.99 55. –999.99 56. –999.99 57. –999.99 58. –999.99 59. –999.99 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 62. Band #2 Frequency Error (Average) [Hz] (resolution 0.01 Hz) 63. Band #2 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 64. Band #2 PDSCH EVM (Average) [%] (resolution 0.01 %) 65. Band #2 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 66. Band #2 Band Power (Average) [dBm] (resolution 0.01 dB) 67. Band #2 Band Power (Maximum) [dBm] (resolution 0.01 dB) 68. Band #2 Band Power (Minimum) [dBm] (resolution 0.01 dB) 69. Band #2 RS Power (Average) [dBm] (resolution 0.01 dB) 70. Band #2 RS Power (Maximum) [dBm] (resolution 0.01 dB) 71. Band #2 RS Power (Minimum) [dBm] (resolution 0.01 dB) 72. Band #2 OSTP Power (Average) [dBm] (resolution 0.01 dB) 73. Band #2 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 74. Band #2 OSTP Power (Minimum) [dBm] (resolution 0.01 dB) 75. –999.99 76. –999.99 77. –999.99 78. –999.99 79. –999.99 80. –999.99 81. –999.99 82. –999.99 83. –999.99 84. –999.99 85. –999.99 86. –999.99 87. –999.99 88. –999.99 89. –999.99 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) 92. CC #0 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 93. CC #0 PDSCH EVM (Average) [%] (resolution 0.01 %) 94. CC #0 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 95. CC #0 Band Power (Average) [dBm] (resolution 0.01 dB) 96. CC #0 Band Power (Maximum) [dBm] (resolution 0.01 dB) 97. CC #0 Band Power (Minimum) [dBm] (resolution 0.01 dB) 98. CC #0 RS Power (Average) [dBm] (resolution 0.01 dB) 99. CC #0 RS Power (Maximum) [dBm] (resolution 0.01 dB) 100. CC #0 RS Power (Minimum) [dBm] (resolution 0.01 dB) 201. CC #0 OSTP Power (Average) [dBm] (resolution 0.01 dB) 102. CC #0 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 103. CC #0 OSTP Power (Minimum) [dBm] (resolution 0.01 dB) 104. CC #1 Frequency Error (Average) [Hz] (resolution 0.01 Hz) 105. CC #1 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 106. CC #1 PDSCH EVM (Average) [%] (resolution 0.01 %) 107. CC #1 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 108. CC #1 Band Power (Average) [dBm] (resolution 0.01 dB) 109. CC #1 Band Power (Maximum) [dBm] (resolution 0.01 dB) 110. CC #1 Band Power (Minimum) [dBm] (resolution 0.01 dB) 111. CC #1 RS Power (Average) [dBm] (resolution 0.01 dB) 112. CC #1 RS Power (Maximum) [dBm] (resolution 0.01 dB) 113. CC #1 RS Power (Minimum) [dBm] (resolution 0.01 dB) 114. CC #1 OSTP Power (Average) [dBm] (resolution 0.01 dB) 115. CC #1 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 116. CC #1 OSTP Power (Minimum) [dBm] (resolution 0.01 dB) 117. CC #2 Frequency Error (Average) [Hz] (resolution 0.01 Hz) 118. CC #2 Frequency Error (Maximum) [Hz] (resolution 0.01 Hz) 119. CC #2 PDSCH EVM (Average) [%] (resolution 0.01 %) 120. CC #2 PDSCH EVM (Maximum) [%] (resolution 0.01 %) 121. CC #2 Band Power (Average) [dBm] (resolution 0.01 dB) 122. CC #2 Band Power (Maximum) [dBm] (resolution 0.01 dB) 123. CC #2 Band Power (Minimum) [dBm] (resolution 0.01 dB) 124. CC #2 RS Power (Average) [dBm] (resolution 0.01 dB) 125. CC #2 RS Power (Maximum) [dBm] (resolution 0.01 dB) 126. CC #2 RS Power (Minimum) [dBm] (resolution 0.01 dB) 127. CC #2 OSTP Power (Average) [dBm] (resolution 0.01 dB) 128. CC #2 OSTP Power (Maximum) [dBm] (resolution 0.01 dB) 129. CC #2 OSTP Power (Minimum) [dBm] (resolution 0.01 dB)

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) 131. CC #3 Frequency Error(Maximum) [Hz] (resolution 0.01 Hz) 132. CC #3 PDSCH EVM(Average) [%] (resolution 0.01 %) 133. CC #3 PDSCH EVM(Maximum) [%] (resolution 0.01 %) 134. CC #3 Band Power(Average) [dBm] (resolution 0.01 dB) 135. CC #3 Band Power(Maximum) [dBm] (resolution 0.01 dB) 136. CC #3 Band Power(Minimum) [dBm] (resolution 0.01 dB) 137. CC #3 RS Power(Average) [dBm] (resolution 0.01 dB) 138. CC #3 RS Power(Maximum) [dBm] (resolution 0.01 dB) 139. CC #3 RS Power(Minimum) [dBm] (resolution 0.01 dB) 140. CC #3 OSTP Power(Average) [dBm] (resolution 0.01 dB) 141. CC #3 OSTP Power(Maximum) [dBm] (resolution 0.01 dB) 142. CC #3 OSTP Power(Minimum) [dBm] (resolution 0.01 dB) 143. CC #4 Frequency Error(Average) [Hz] (resolution 0.01 Hz) 144. CC #4 Frequency Error(Maximum) [Hz] (resolution 0.01 Hz) 145. CC #4 PDSCH EVM(Average) [%] (resolution 0.01 %) 146. CC #4 PDSCH EVM(Maximum) [%] (resolution 0.01 %) 147. CC #4 Band Power(Average) [dBm] (resolution 0.01 dB) 148. CC #4 Band Power(Maximum) [dBm] (resolution 0.01 dB) 149. CC #4 Band Power(Minimum) [dBm] (resolution 0.01 dB) 150. CC #4 RS Power(Average) [dBm] (resolution 0.01 dB) 151. CC #4 RS Power(Maximum) [dBm] (resolution 0.01 dB) 152. CC #4 RS Power(Minimum) [dBm] (resolution 0.01 dB) 153. CC #4 OSTP Power(Average) [dBm] (resolution 0.01 dB) 154. CC #4 OSTP Power(Maximum) [dBm] (resolution 0.01 dB) 155. CC #4 OSTP Power(Minimum) [dBm] (resolution 0.01 dB) 156. CC #0 Time Offset(Average) [s] (resolution 0.1 ns) 157. CC #0 Time Offset(Maximum) [s] (resolution 0.1 ns) 158. CC #1 Time Offset(Average) [s] (resolution 0.1 ns) 159. CC #1 Time Offset(Maximum) [s] (resolution 0.1 ns) 160. CC #2 Time Offset(Average) [s] (resolution 0.1 ns) 161. CC #2 Time Offset(Maximum) [s] (resolution 0.1 ns) 162. CC #3 Time Offset(Average) [s] (resolution 0.1 ns) 163. CC #3 Time Offset(Maximum) [s] (resolution 0.1 ns) 164. CC #4 Time Offset(Average) [s] (resolution 0.1 ns) 165. CC #4 Time Offset(Maximum) [s] (resolution 0.1 ns) 166. CC #0 Total EVM (Average) [%] (resolution 0.01%) 167. CC #0 Total EVM (Maximum) [%] (resolution 0.01%) 168. CC #1 Total EVM (Average) [%] (resolution 0.01%) 169. CC #1 Total EVM (Maximum) [%] (resolution 0.01%) 170. CC #2 Total EVM (Average) [%] (resolution 0.01%) 171. CC #2 Total EVM (Maximum) [%] (resolution 0.01%)) 172. CC #3 Total EVM (Average) [%] (resolution 0.01%)

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%) 174. CC #4 Total EVM (Average) [%] (resolution 0.01%) 175. CC #4 Total EVM (Maximum) [%] (resolution 0.01%) 176. CC #0 PDSCH QPSK EVM (Average) [%] (resolution 0.01%) 177. CC #0 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%) 178. CC #1 PDSCH QPSK EVM (Average) [%] (resolution 0.01%) 179. CC #1 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%) 180. CC #2 PDSCH QPSK EVM (Average) [%] (resolution 0.01%) 181. CC #2 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%) 182. CC #3 PDSCH QPSK EVM (Average) [%] (resolution 0.01%) 183. CC #3 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%) 184. CC #4 PDSCH QPSK EVM (Average) [%] (resolution 0.01%) 185. CC #4 PDSCH QPSK EVM (Maximum) [%] (resolution 0.01%) 186. CC #0 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%) 187. CC #0 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%) 188. CC #1 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%) 189. CC #1 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%) 190. CC #2 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%) 191. CC #2 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%) 192. CC #3 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%) 193. CC #3 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%) 194. CC #4 PDSCH 16QAM EVM (Average) [%] (resolution 0.01%) 195. CC #4 PDSCH 16QAM EVM (Maximum) [%] (resolution 0.01%) 196. CC #0 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%) 197. CC #0 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%) 198. CC #1 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%) 199. CC #1 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%) 200. CC #2 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%) 201. CC #2 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%) 202. CC #3 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%) 203. CC #3 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%) 204. CC #4 PDSCH 64QAM EVM (Average) [%] (resolution 0.01%) 205. CC #4 PDSCH 64QAM EVM (Maximum) [%] (resolution 0.01%) 206. CC #0 Origin Offset (Average) [dB] (resolution 0.1 dB) 207. CC #0 Origin Offset (Maximum) [dB] (resolution 0.1 dB) 208. CC #1 Origin Offset (Average) [dB] (resolution 0.1 dB) 209. CC #1 Origin Offset (Maximum) [dB] (resolution 0.1 dB) 210. CC #2 Origin Offset (Average) [dB] (resolution 0.1 dB) 211. CC #2 Origin Offset (Maximum) [dB] (resolution 0.1 dB) 212. CC #3 Origin Offset (Average) [dB] (resolution 0.1 dB) 213. CC #3 Origin Offset (Maximum) [dB] (resolution 0.1 dB) 214. CC #4 Origin Offset (Average) [dB] (resolution 0.1 dB) 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%) 217. CC #0 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%) 218. CC #1 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%) 219. CC #1 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%) 220. CC #2 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%) 221. CC #2 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%) 222. CC #3 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%) 223. CC #3 PDSCH 256QAM EVM (Maximum) [%] (resolution 0.01%) 224. CC #4 PDSCH 256QAM EVM (Average) [%] (resolution 0.01%) 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: 1. Band #0 Measurement Status 2. Band #0 OBW [MHz] (resolution 0.0001 MHz) 3. Band #0 ACLR E-UTRA L2 [dB] (resolution 0.01 dB) 4. Band #0 ACLR E-UTRA L1 [dB] (resolution 0.01 dB) 5. Band #0 ACLR E-UTRA U1 [dB] (resolution 0.01 dB) 6. Band #0 ACLR E-UTRA U2 [dB] (resolution 0.01 dB) 7. Band #0 ACLR UTRA L2 [dB] (resolution 0.01 dB) 8. Band #0 ACLR UTRA L1 [dB] (resolution 0.01 dB) 9. Band #0 ACLR UTRA U1 [dB] (resolution 0.01 dB) 10. Band #0 ACLR UTRA U2 [dB] (resolution 0.01 dB) 11. Band #0 OBUE Margin [dB] (resolution 0.01 dB) 12. Band #0 OBUE Peak Absolute Level [dBm] (resolution 0.01 dB) 13. Band #0 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz) 14. Band #1 Measurement Status 15. Band #1 OBW [MHz] (resolution 0.0001 MHz) 16. Band #1 ACLR E-UTRA L2 [dB] (resolution 0.01 dB) 17. Band #1 ACLR E-UTRA L1 [dB] (resolution 0.01 dB) 18. Band #1 ACLR E-UTRA U1 [dB] (resolution 0.01 dB) 19. Band #1 ACLR E-UTRA U2 [dB] (resolution 0.01 dB) 20. Band #1 ACLR UTRA L2 [dB] (resolution 0.01 dB) 21. Band #1 ACLR UTRA L1 [dB] (resolution 0.01 dB) 22. Band #1 ACLR UTRA U1 [dB] (resolution 0.01 dB) 23. Band #1 ACLR UTRA U2 [dB] (resolution 0.01 dB) 24. Band #1 OBUE Margin [dB] (resolution 0.01 dB) 25. Band #1 OBUE Peak Absolute Level [dBm] (resolution 0.01 dB) 26. Band #1 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz) 27. Band #2 Measurement Status 28. Band #2 OBW [MHz] (resolution 0.0001 MHz) 29. Band #2 ACLR E-UTRA L2 [dB] (resolution 0.01 dB) 30. Band #2 ACLR E-UTRA L1 [dB] (resolution 0.01 dB) 31. Band #2 ACLR E-UTRA U1 [dB] (resolution 0.01 dB) 32. Band #2 ACLR E-UTRA U2 [dB] (resolution 0.01 dB) 33. Band #2 ACLR UTRA L2 [dB] (resolution 0.01 dB) 34. Band #2 ACLR UTRA L1 [dB] (resolution 0.01 dB) 35. Band #2 ACLR UTRA U1 [dB] (resolution 0.01 dB) 36. Band #2 ACLR UTRA U2 [dB] (resolution 0.01 dB) 37. Band #2 OBUE Margin [dB] (resolution 0.01 dB) 38. Band #2 OBUE Peak Absolute Level [dBm] (resolution 0.01 dB) 39. Band #2 OBUE Peak Frequency [MHz] (resolution 0.0001 MHz) 40. CC #0 OBW [MHz] (resolution 0.0001 MHz) 41. CC #1 OBW [MHz] (resolution 0.0001 MHz) 42. CC #2 OBW [MHz] (resolution 0.0001 MHz) 43. CC #3 OBW [MHz] (resolution 0.0001 MHz) 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: 1. Band #0 OBW/ACLR Spectrum trace point number 2. Band #1 OBW/ACLR Spectrum trace point number 3. Band #2 OBW/ACLR Spectrum trace point number
4	A/B	Responses are returned with comma-separated value formats in the following order: 1. Band #0 Lower OBUE Spectrum (Normal) trace point number 2. Band #0 Upper OBUE Spectrum (Normal) trace point number 3. Band #1 Lower OBUE Spectrum (Normal) trace point number 4. Band #1 Upper OBUE Spectrum (Normal) trace point number 5. Band #2 Lower OBUE Spectrum (Normal) trace point number 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: 1. Band #0 Lower OBUE Spectrum (Additional) trace point number 2. Band #0 Upper OBUE Spectrum (Additional) trace point number 3. Band #1 Lower OBUE Spectrum (Additional) trace point number 4. Band #1 Upper OBUE Spectrum (Additional) trace point number 5. Band #2 Lower OBUE Spectrum (Additional) trace point number 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: 1 to n OBW/ACLR Spectrum absolute level 1. Band #0 1st OBW/ACLR Spectrum absolute level 2. Band #0 2nd OBW/ACLR Spectrum absolute level … n. Band #0 nth OBW/ACLR Spectrum absolute level ***Note:*** 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: 1 to n OBW/ACLR Spectrum frequency 1. Band #0 1st OBW/ACLR Spectrum frequency 2. Band #0 2nd OBW/ACLR Spectrum frequency … n. Band #0 nth OBW/ACLR Spectrum frequency ***Note:*** n is the Band #0 OBW/ACLR Spectrum trace point number.
13	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal Margin 1. Band #0 1st Lower OBUE Spectrum Normal Margin 2. Band #0 2nd Lower OBUE Spectrum Normal Margin … n. Band #0 nth Lower OBUE Spectrum Normal Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal Margin 1. Band #0 1st Upper OBUE Spectrum Normal Margin 2. Band #0 2nd Upper OBUE Spectrum Normal Margin … n. Band #0 nth Upper OBUE Spectrum Normal Margin ***Note:*** n is the Band #0 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
15	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional Margin 1. Band #0 1st Lower OBUE Spectrum Additional Margin 2. Band #0 2nd Lower OBUE Spectrum Additional Margin … n. Band #0 nth Lower OBUE Spectrum Additional Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional Margin 1. Band #0 1st Upper OBUE Spectrum Additional Margin 2. Band #0 2nd Upper OBUE Spectrum Additional Margin … n. Band #0 nth Upper OBUE Spectrum Additional Margin ***Note:*** n is the Band #0 Upper OBUE Spectrum (Additional) trace point number.
17	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal absolute level 1. Band #0 1st Lower OBUE Spectrum Normal absolute level 2. Band #0 2nd Lower OBUE Spectrum Normal absolute level … n. Band #0 nth Lower OBUE Spectrum Normal absolute level ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal absolute level 1. Band #0 1st Upper OBUE Spectrum Normal absolute level 2. Band #0 2nd Upper OBUE Spectrum Normal absolute level … n. Band #0 nth Upper OBUE Spectrum Normal absolute level ***Note:*** n is the Band #0 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
19	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #0 1st Lower OBUE Spectrum Additional absolute level 2. Band #0 2nd Lower OBUE Spectrum Additional absolute level … n. Band #0 nth Lower OBUE Spectrum Additional absolute level ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #0 1st Upper OBUE Spectrum Additional absolute level 2. Band #0 2nd Upper OBUE Spectrum Additional absolute level … n. Band #0 nth Upper OBUE Spectrum Additional absolute level ***Note:*** n is the Band #0 Upper OBUE Spectrum (Additional) trace point number.
21	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal standard value 1. Band #0 1st Lower OBUE Spectrum Normal standard value 2. Band #0 2nd Lower OBUE Spectrum Normal standard value … n. Band #0 nth Lower OBUE Spectrum Normal standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal standard value 1. Band #0 1st Upper OBUE Spectrum Normal standard value 2. Band #0 2nd Upper OBUE Spectrum Normal standard value … n. Band #0 nth Upper OBUE Spectrum Normal standard value ***Note:*** n is the Band #0 Upper OBUE Spectrum (Normal) trace point number

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
23	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional standard value 1. Band #0 1st Lower OBUE Spectrum Additional standard value 2. Band #0 2nd Lower OBUE Spectrum Additional standard value … n. Band #0 nth Lower OBUE Spectrum Additional standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional standard value 1. Band #0 1st Upper OBUE Spectrum Additional standard value 2. Band #0 2nd Upper OBUE Spectrum Additional standard value … n. Band #0 nth Upper OBUE Spectrum Additional standard value ***Note:*** n is the Band #0 Upper OBUE Spectrum (Additional) trace point number.
25	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal frequency 1. Band #0 1st Lower OBUE Spectrum Normal frequency 2. Band #0 2nd Lower OBUE Spectrum Normal frequency … n. Band #0 nth Lower OBUE Spectrum Normal frequency ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal frequency 1. Band #0 1st Upper OBUE Spectrum Normal frequency 2. Band #0 2nd Upper OBUE Spectrum Normal frequency … n. Band #0 nth Upper OBUE Spectrum Normal frequency ***Note:*** n is the Band #0 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
27	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional frequency 1. Band #0 1st Lower OBUE Spectrum Additional frequency 2. Band #0 2nd Lower OBUE Spectrum Additional frequency … n. Band #0 nth Lower OBUE Spectrum Additional frequency ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional frequency 1. Band #0 1st Upper OBUE Spectrum Additional frequency 2. Band #0 2nd Upper OBUE Spectrum Additional frequency … n. Band #0 nth Upper OBUE Spectrum Additional frequency ***Note:*** n is the Band #0 Upper OBUE Spectrum (Additional) trace point number.
29	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal RBW 1. Band #0 1st Lower OBUE Spectrum Normal RBW 2. Band #0 2nd Lower OBUE Spectrum Normal RBW … n. Band #0 nth Lower OBUE Spectrum Normal RBW ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal RBW 1. Band #0 1st Upper OBUE Spectrum Normal RBW 2. Band #0 2nd Upper OBUE Spectrum Normal RBW … n. Band #0 nth Upper OBUE Spectrum Normal RBW ***Note:*** n is the Band #0 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
31	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional RBW 1. Band #0 1st Lower OBUE Spectrum Additional RBW 2. Band #0 2nd Lower OBUE Spectrum Additional RBW … n. Band #0 nth Lower OBUE Spectrum Additional RBW ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional RBW 1. Band #0 1st Upper OBUE Spectrum Additional RBW 2. Band #0 2nd Upper OBUE Spectrum Additional RBW … n. Band #0 nth Upper OBUE Spectrum Additional RBW ***Note:*** n is the Band #0 Upper OBUE Spectrum (Additional) trace point number.
41	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n OBW/ACLR Spectrum absolute level 1. Band #1 1st OBW/ACLR Spectrum absolute level 2. Band #1 2nd OBW/ACLR Spectrum absolute level … n. Band #1 nth OBW/ACLR Spectrum absolute level ***Note:*** 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: 1 to n OBW/ACLR Spectrum frequency 1. Band #1 1st OBW/ACLR Spectrum frequency 2. Band #1 2nd OBW/ACLR Spectrum frequency … n. Band #1 nth OBW/ACLR Spectrum frequency ***Note:*** 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: 1 to n Lower OBUE Spectrum Normal Margin 1. Band #1 1st Lower OBUE Spectrum Normal Margin 2. Band #1 2nd Lower OBUE Spectrum Normal Margin … n. Band #1 nth Lower OBUE Spectrum Normal Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal Margin 1. Band #1 1st Upper OBUE Spectrum Normal Margin 2. Band #1 2nd Upper OBUE Spectrum Normal Margin … n. Band #1 nth Upper OBUE Spectrum Normal Margin ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional Margin 1. Band #1 1st Lower OBUE Spectrum Additional Margin 2. Band #1 2nd Lower OBUE Spectrum Additional Margin … n. Band #1 nth Lower OBUE Spectrum Additional Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional Margin 1. Band #1 1st Upper OBUE Spectrum Additional Margin 2. Band #1 2nd Upper OBUE Spectrum Additional Margin … n. Band #1 nth Upper OBUE Spectrum Additional Margin ***Note:*** 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: 1 to n Lower OBUE Spectrum Normal absolute level 1. Band #1 1st Lower OBUE Spectrum Normal absolute level 2. Band #1 2nd Lower OBUE Spectrum Normal absolute level … n. Band #1 nth Lower OBUE Spectrum Normal absolute level ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal absolute level 1. Band #1 1st Upper OBUE Spectrum Normal absolute level 2. Band #1 2nd Upper OBUE Spectrum Normal absolute level … n. Band #1 nth Upper OBUE Spectrum Normal absolute level ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #1 1st Lower OBUE Spectrum Additional absolute level 2. Band #1 2nd Lower OBUE Spectrum Additional absolute level … n. Band #1 nth Lower OBUE Spectrum Additional absolute level ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #1 1st Upper OBUE Spectrum Additional absolute level 2. Band #1 2nd Upper OBUE Spectrum Additional absolute level … n. Band #1 nth Upper OBUE Spectrum Additional absolute level ***Note:*** 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: 1 to n Lower OBUE Spectrum Normal standard value 1. Band #1 1st Lower OBUE Spectrum Normal standard value 2. Band #1 2nd Lower OBUE Spectrum Normal standard value … n. Band #1 nth Lower OBUE Spectrum Normal standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal standard value 1. Band #1 1st Upper OBUE Spectrum Normal standard value 2. Band #1 2nd Upper OBUE Spectrum Normal standard value … n. Band #1 nth Upper OBUE Spectrum Normal standard value ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional standard value 1. Band #1 1st Lower OBUE Spectrum Additional standard value 2. Band #1 2nd Lower OBUE Spectrum Additional standard value … n. Band #1 nth Lower OBUE Spectrum Additional standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional standard value 1. Band #1 1st Upper OBUE Spectrum Additional standard value 2. Band #1 2nd Upper OBUE Spectrum Additional standard value … n. Band #1 nth Upper OBUE Spectrum Additional standard value ***Note:*** 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: 1 to n Lower OBUE Spectrum Normal frequency 1. Band #1 1st Lower OBUE Spectrum Normal frequency 2. Band #1 2nd Lower OBUE Spectrum Normal frequency … n. Band #1 nth Lower OBUE Spectrum Normal frequency ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal frequency 1. Band #1 1st Upper OBUE Spectrum Normal frequency 2. Band #1 2nd Upper OBUE Spectrum Normal frequency … n. Band #1 nth Upper OBUE Spectrum Normal frequency ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional frequency 1. Band #1 1st Lower OBUE Spectrum Additional frequency 2. Band #1 2nd Lower OBUE Spectrum Additional frequency … n. Band #1 nth Lower OBUE Spectrum Additional frequency ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional frequency 1. Band #1 1st Upper OBUE Spectrum Additional frequency 2. Band #1 2nd Upper OBUE Spectrum Additional frequency … n. Band #1 nth Upper OBUE Spectrum Additional frequency ***Note:*** 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: 1 to n Lower OBUE Spectrum Normal RBW 1. Band #1 1st Lower OBUE Spectrum Normal RBW 2. Band #1 2nd Lower OBUE Spectrum Normal RBW … n. Band #1 nth Lower OBUE Spectrum Normal RBW ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal RBW 1. Band #1 1st Upper OBUE Spectrum Normal RBW 2. Band #1 2nd Upper OBUE Spectrum Normal RBW … n. Band #1 nth Upper OBUE Spectrum Normal RBW ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional RBW 1. Band #1 1st Lower OBUE Spectrum Additional RBW 2. Band #1 2nd Lower OBUE Spectrum Additional RBW … n. Band #1 nth Lower OBUE Spectrum Additional RBW ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional RBW 1. Band #1 1st Upper OBUE Spectrum Additional RBW 2. Band #1 2nd Upper OBUE Spectrum Additional RBW … n. Band #1 nth Upper OBUE Spectrum Additional RBW ***Note:*** 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: 1 to n OBW/ACLR Spectrum absolute level 1. Band #2 1st OBW/ACLR Spectrum absolute level 2. Band #2 2nd OBW/ACLR Spectrum absolute level … n. Band #2 nth OBW/ACLR Spectrum absolute level ***Note:*** 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: 1 to n OBW/ACLR Spectrum frequency 1. Band #2 1st OBW/ACLR Spectrum frequency 2. Band #2 2nd OBW/ACLR Spectrum frequency … n. Band #2 nth OBW/ACLR Spectrum frequency ***Note:*** n is the Band #2 OBW/ACLR Spectrum trace point number.
73	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal Margin 1. Band #2 1st Lower OBUE Spectrum Normal Margin 2. Band #2 2nd Lower OBUE Spectrum Normal Margin … n. Band #2 nth Lower OBUE Spectrum Normal Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal Margin 1. Band #2 1st Upper OBUE Spectrum Normal Margin 2. Band #2 2nd Upper OBUE Spectrum Normal Margin … n. Band #2 nth Upper OBUE Spectrum Normal Margin ***Note:*** n is the Band #2 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
75	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional Margin 1. Band #2 1st Lower OBUE Spectrum Additional Margin 2. Band #2 2nd Lower OBUE Spectrum Additional Margin … n. Band #2 nth Lower OBUE Spectrum Additional Margin ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional Margin 1. Band #2 1st Upper OBUE Spectrum Additional Margin 2. Band #2 2nd Upper OBUE Spectrum Additional Margin … n. Band #2 nth Upper OBUE Spectrum Additional Margin ***Note:*** n is the Band #2 Upper OBUE Spectrum (Additional) trace point number.
77	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal absolute level 1. Band #2 1st Lower OBUE Spectrum Normal absolute level 2. Band #2 2nd Lower OBUE Spectrum Normal absolute level … n. Band #2 nth Lower OBUE Spectrum Normal absolute level ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal absolute level 1. Band #2 1st Upper OBUE Spectrum Normal absolute level 2. Band #2 2nd Upper OBUE Spectrum Normal absolute level … n. Band #2 nth Upper OBUE Spectrum Normal absolute level ***Note:*** n is the Band #2 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
79	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #2 1st Lower OBUE Spectrum Additional absolute level 2. Band #2 2nd Lower OBUE Spectrum Additional absolute level … n. Band #2 nth Lower OBUE Spectrum Additional absolute level ***Note:*** 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: 1 to n Lower OBUE Spectrum Additional absolute level 1. Band #2 1st Upper OBUE Spectrum Additional absolute level 2. Band #2 2nd Upper OBUE Spectrum Additional absolute level … n. Band #2 nth Upper OBUE Spectrum Additional absolute level ***Note:*** n is the Band #2 Upper OBUE Spectrum (Additional) trace point number.
81	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal standard value 1. Band #2 1st Lower OBUE Spectrum Normal standard value 2. Band #2 2nd Lower OBUE Spectrum Normal standard value … n. Band #2 nth Lower OBUE Spectrum Normal standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal standard value 1. Band #2 1st Upper OBUE Spectrum Normal standard value 2. Band #2 2nd Upper OBUE Spectrum Normal standard value … n. Band #2 nth Upper OBUE Spectrum Normal standard value ***Note:*** n is the Band #2 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
83	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional standard value 1. Band #2 1st Lower OBUE Spectrum Additional standard value 2. Band #2 2nd Lower OBUE Spectrum Additional standard value … n. Band #2 nth Lower OBUE Spectrum Additional standard value ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional standard value 1. Band #2 1st Upper OBUE Spectrum Additional standard value 2. Band #2 2nd Upper OBUE Spectrum Additional standard value … n. Band #2 nth Upper OBUE Spectrum Additional standard value ***Note:*** n is the Band #2 Upper OBUE Spectrum (Additional) trace point number.
85	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Normal frequency 1. Band #2 1st Lower OBUE Spectrum Normal frequency 2. Band #2 2nd Lower OBUE Spectrum Normal frequency … n. Band #2 nth Lower OBUE Spectrum Normal frequency ***Note:*** 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: 1 to n Upper OBUE Spectrum Normal frequency 1. Band #2 1st Upper OBUE Spectrum Normal frequency 2. Band #2 2nd Upper OBUE Spectrum Normal frequency … n. Band #2 nth Upper OBUE Spectrum Normal frequency ***Note:*** n is the Band #2 Upper OBUE Spectrum (Normal) trace point number.

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

<table>
<tr><th>n</th><th>Result Mode</th><th>Response</th></tr>
<tr><td>87</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to n Lower OBUE Spectrum Additional frequency
1. Band #2 1st Lower OBUE Spectrum Additional frequency
2. Band #2 2nd Lower OBUE Spectrum Additional frequency
…
n. Band #2 nth Lower OBUE Spectrum Additional frequency
Note:
n is the Band #2 Lower OBUE Spectrum (Additional) trace point number.</td></tr>
<tr><td>88</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to n Upper OBUE Spectrum Additional frequency
1. Band #2 1st Upper OBUE Spectrum Additional frequency
2. Band #2 2nd Upper OBUE Spectrum Additional frequency
…
n. Band #2 nth Upper OBUE Spectrum Additional frequency
Note:
n is the Band #2 Upper OBUE Spectrum (Additional) trace point number.</td></tr>
<tr><td>89</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to n Lower OBUE Spectrum Normal RBW
1. Band #2 1st Lower OBUE Spectrum Normal RBW
2. Band #2 2nd Lower OBUE Spectrum Normal RBW
…
n. Band #2 nth Lower OBUE Spectrum Normal RBW
Note:
n is the Band #2 Lower OBUE Spectrum (Normal) trace point number.</td></tr>
<tr><td>90</td><td>A/B</td><td>Responses are returned with comma-separated value formats in the following order:
1 to n Upper OBUE Spectrum Normal RBW
1. Band #2 1st Upper OBUE Spectrum Normal RBW
2. Band #2 2nd Upper OBUE Spectrum Normal RBW
…
n. Band #2 nth Upper OBUE Spectrum Normal RBW
Note:
n is the Band #2 Upper OBUE Spectrum (Normal) trace point number.</td></tr>
</table>

Table 2.9-2 Responses to Batch Measurement Results (Cont'd)

n	Result Mode	Response
91	A/B	Responses are returned with comma-separated value formats in the following order: 1 to n Lower OBUE Spectrum Additional RBW 1. Band #2 1st Lower OBUE Spectrum Additional RBW 2. Band #2 2nd Lower OBUE Spectrum Additional RBW … n. Band #2 nth Lower OBUE Spectrum Additional RBW ***Note:*** 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: 1 to n Upper OBUE Spectrum Additional RBW 1. Band #2 1st Upper OBUE Spectrum Additional RBW 2. Band #2 2nd Upper OBUE Spectrum Additional RBW … n. Band #2 nth Upper OBUE Spectrum Additional RBW ***Note:*** 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?`
Batch Storage Mode for Unwanted Emissions	`[:SENSe]:BATCh:AVERage:UWEMissions[:STATe] OFF|ON|0|1`
	`[:SENSe]:BATCh:AVERage:UWEMissions[:STATe]?`
Batch 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 Measurement Result Saving Function

Table 2.10-1 lists device messages for saving measurement results.

Table 2.10-1 Measurement Result Saving Function

Function	Device message
Save All Results	`:MMEMory:STORe:RESult [<filename>[,<device>]]`
Save as Type	`:MMEMory:STORe:RESult:MODE XML|CSV`
	`:MMEMory:STORe:RESult:MODE?`

:MMEMory:STORe:RESult [<filename>[,<device>]]

Save All Results Data

Function

This command saves a measurement result in a file.

Command

```
:MMEMory:STORe:RESult [<filename>[,<device>]]
```

Parameter

`<filename>`	Target filename Character string within 32 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) The following characters cannot be used: `\ / : * ? " " ' ' < > |` Automatically named “LTEDL date_sequential number.xml”. LTEDL20080617_00.xml
`<device>`	Drive name `A,B,D,E,F,...` D drive is used when omitted.

Details

When a file name is not specified, the sequence numbers suffixed to a file name are 00 to 99.
No more files can be saved when all numbers through 99 are used.

Files are saved to the following directory in the specified drive.
\Anritsu Corporation\Signal Analyzer\User Data\Measurement Results\3GLTE Downlink

Up to 1000 files can be saved in the folder.

Example of Use

To save a measurement result with the file name “TEST” to the internal hard disk.

```
MMEM:STOR:RES "TEST",D
```

:MMEMory:STORe:RESult:MODE XML|CSV

Save as Type

Function

This command sets the type of the file to be saved.

Command

`:MMEMory:STORe:RESult:MODE <mode>`

Parameter

<mode>	File type
XML	xml format (Default)
CSV	csv format

Example of Use

To set the type of the file to be saved to csv format.

```
MMEM:STOR:RES:MODE CSV
```

:MMEMory:STORe:RESult:MODE?

Save as Type Query

Function

This command queries the type of the file to be saved.

Query

`:MMEMory:STORe:RESult:MODE?`

Response

`<mode>`

Parameter

<mode>	File type
XML	xml format
CSV	csv format

Example of Use

To query the type of the file to be saved.

```
MMEM:STOR:RES:MODE?
> CSV
```

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 2.11-2 lists the responses to parameter [n] of the device messages in Table 2.11-1.

Table 2.11-2 Responses to MIMO Summary Measurement Result

n	Result Mode	Response
1	A/B	Responses are returned with comma-separated value formats in the following order: 1. RS power of Antenna port 0 (Average) 2. RS power of Antenna port 0 (Max) 3. RS EVM (rms) of Antenna port 0 (Average) 4. RS EVM (rms) of Antenna port 0 (Max) 5. Timing Offset of Antenna port 0 (Average) 6. Timing Offset of Antenna port 0 (Max) 7. RS Phase of Antenna port 0 (Average) 8. RS Phase of Antenna port 0 (Max) 9. RS Freq of Antenna port 0 (Average) 10. RS Freq of Antenna port 0 (Max) 11. RS power (dBm) of Antenna port 0 (Average) 12. RS power (dBm) of Antenna port 0 (Max) 13. –999.0 14. –999.0 15. –999.0 16. –999.0 17. –999.0 18. –999.0 19. –999.0 20. –999.0

Table 2.11-2 Responses to MIMO Summary Measurement Result (Continued)

n	Result Mode	Response
1	A/B	21. RS power (dB) of Antenna port 1 (Average) 22. RS power (dB) of Antenna port 1 (Max) 23. RS EVM (rms) of Antenna port 1 (Average) 24. RS EVM (rms) of Antenna port 1 (Max) 25. Timing Offset of Antenna port 1 (Average) 26. Timing Offset of Antenna port 1 (Max) 27. RS Phase of Antenna port 1 (Average) 28. RS Phase of Antenna port 1 (Max) 29. RS Freq of Antenna port 1 (Average) 30. RS Freq of Antenna port 1 (Max) 31. RS power (dBm) of Antenna port 1 (Average) 32. RS power (dBm) of Antenna port 1 (Max) 33. –999.0 34. –999.0 35. –999.0 36. –999.0 37. –999.0 38. –999.0 39. –999.0 40. –999.0 41. RS power (dB) of Antenna port 2 (Average) 42. RS power (dB) of Antenna port 2 (Max) 43. RS EVM (rms) of Antenna port 2 (Average) 44. RS EVM (rms) of Antenna port 2 (Max) 45. Timing Offset of Antenna port 2 (Average) 46. Timing Offset of Antenna port 2 (Max) 47. RS Phase of Antenna port 2 (Average) 48. RS Phase of Antenna port 2 (Max) 49. RS Freq of Antenna port 2 (Average) 50. RS Freq of Antenna port 2 (Max) 51. RS power (dBm) of Antenna port 2 (Average) 52. RS power (dBm) of Antenna port 2 (Max) 53. –999.0 54. –999.0 55. –999.0 56. –999.0 57. –999.0 58. –999.0 59. –999.0 60. –999.0

Table 2.11-2 Responses to MIMO Summary Measurement Result (Continued)

n	Result Mode	Response
1	A/B	61. RS power (dB) of Antenna port 3 (Average) 62. RS power (dB) of Antenna port 3 (Max) 63. RS EVM (rms) of Antenna port 3 (Average) 64. RS EVM (rms) of Antenna port 3 (Max) 65. Timing Offset of Antenna port 3 (Average) 66. Timing Offset of Antenna port 3 (Max) 67. RS Phase of Antenna port 3 (Average) 68. RS Phase of Antenna port 3 (Max) 69. RS Freq of Antenna port 3 (Average) 70. RS Freq of Antenna port 3 (Max) 71. RS power (dBm) of Antenna port 3 (Average) 72. RS power (dBm) of Antenna port 3 (Max) 73. –999.0 74. –999.0 75. –999.0 76. –999.0 77. –999.0 78. –999.0 79. –999.0 80. –999.0
10	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna0 spectrum flatness amplitude 1. Antenna0 spectrum flatness amplitude of the 0th subcarrier 2. Antenna0 spectrum flatness amplitude of the 1st subcarrier … N. Antenna0 spectrum flatness amplitude of the (N-1)th subcarrier
11	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna1 spectrum flatness amplitude 1. Antenna1 spectrum flatness amplitude of the 0th subcarrier 2. Antenna1 spectrum flatness amplitude of the 1st subcarrier … N. Antenna1 spectrum flatness amplitude of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 2.

Table 2.11-2 Responses to MIMO Summary Measurement Result (Continued)

n	Result Mode	Response
12	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna2 spectrum flatness amplitude 1. Antenna2 spectrum flatness amplitude of the 0th subcarrier 2. Antenna2 spectrum flatness amplitude of the 1st subcarrier … N. Antenna2 spectrum flatness amplitude of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 4.
13	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna3 spectrum flatness amplitude 1. Antenna3 spectrum flatness amplitude of the 0th subcarrier 2. Antenna3 spectrum flatness amplitude of the 1st subcarrier … N. Antenna3 spectrum flatness amplitude of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 4.
18	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna0 spectrum flatness phase 1. Antenna0 spectrum flatness phase of the 0th subcarrier 2. Antenna0 spectrum flatness phase of the 1st subcarrier … N. Antenna0 spectrum flatness phase of the (N-1)th subcarrier
19	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna1 spectrum flatness phase 1. Antenna1 spectrum flatness phase of the 0th subcarrier 2. Antenna1 spectrum flatness phase of the 1st subcarrier … N. Antenna1 spectrum flatness phase of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 2.

Table 2.11-2 Responses to MIMO Summary Measurement Result (Continued)

n	Result Mode	Response
20	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna2 spectrum flatness phase 1. Antenna2 spectrum flatness phase of the 0th subcarrier 2. Antenna2 spectrum flatness phase of the 1st subcarrier … N. Antenna2 spectrum flatness phase of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 4.
21	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Antenna3 spectrum flatness phase 1. Antenna3 spectrum flatness phase of the 0th subcarrier 2. Antenna3 spectrum flatness phase of the 1st subcarrier … N. Antenna3 spectrum flatness phase of the (N-1)th subcarrier ***Note:*** Returns unmeasured value if the number of antenna port is under 4.

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 <level>`
	`:CALCulate:EVM:ANTenna:THReshold?`

2.11.1 Active Antenna Threshold

:CALCulate:EVM:ANTenna:THReshold <level>

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 <level>
```

Parameter

`<level>`	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

```
<level>
```

Parameter

`<level>`	Threshold
Range	–100.0 to 0.0

Example of Use

To query the threshold value.

```
CALC:EVM:ANT:THR?
> -30.0
```

2.12 Replay Function

Table 2.12-1 lists the device messages for the Replay function.

Table 2.12-1 Device message for setting 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 Character string within 32 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) (excluding extension) The following characters cannot be used: \ / : * ? “ ” ‘ ’ < > |
`<device>`	Drive name A,B,D,E,F,...
`<application>`	Application to load IQ data file
3GLTE_DL	LTE 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 “TEST” from drive D and execute the replay function.

```
MMEM:LOAD:IQD “TEST”,D,3GLTE_DL
```

: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 Character string within 32 characters (excluding extension) *** is returned when the Replay function is not executed.
`<time_length>`	Time length of analyzable IQ data
Resolution	1 frame No suffix code. Value is returned in frame units. –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 Character string within 32 characters (excluding extension) *** 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 `A,B,D,E,F,...` *** 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
`3GLTE_DL`	LTE 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 n or 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 Level Over is displayed while the replay function is executed.

```
MMEM:LOAD:IQD:INF:ERR?
> 0
```

:MMEMory:LOAD:IQData:INFormation:CORRection?

Replay Correction Query

Function

This command 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 0.000 is returned when Correction is Off. –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?
```

2.13 Batch Measure Function Settings

Table 2.13-1 lists device messages for setting the Batch Measure function.

Table 2.13-1 Device Messages for Batch Measure Settings

Function	Device Message
Reloading Parameter List Files	`:MMEMory:RELoad:BATCh [<device>]`
Adjacent Channel Modulation Analysis Measure	`:MEASure:BATCh:EVM[n]? <filename>[,<device>]`

:MMEMory:RELoad:BATCh [<device>]

Reloading Parameter List Files

Function

This command applies changes to parameter list files on the specified drive.

Command

```
:MMEMory:RELoad:BATCh [<device>]
```

Parameter

`<device>`	Drive name `A,B,D,E,F,...` D drive is used when omitted.

Details

The parameter list files used for batch measurement are loaded in batch when the main unit is started up or when an application is loaded. Therefore, if the files are changed after startup (or after loading an application), the changes do not apply to measurement. (Measurement is performed using the parameters from before any changes.)
This command applies changes to parameter list files. Therefore, the settings in parameter list files when this command is transmitted can be used for subsequent batch measurement.

Place parameter list files in a folder on the specified drive.

<device>:\Anritsu Corporation\Signal Analyzer\User Data\Batch

This command supports updates to parameter list files used by the command below. For updates to the parameter list files of other applications, change the system to that application, and then transmit the update command.

```
:MEASure:BATCh:EVM[n]?
```

:MEASure:BATCh:EVM[n]? <filename>[,<device>]

Modulation Analysis Batch Measure

Function

This command specifies the parameters in the specified parameter list file, performs ACP measurement, and outputs the results.

Query

```
:MEASure:BATCh:EVM[n]? <filename>[,<device>]
```

Response

The returned response is the same as the `:MEASure:EVM[n]?` value.
For details, see `:MEASure:EVM[n]?`.

Parameter

`<filename>`	Parameter List File Specify with any character string enclosed by double quotes (“ ”) or single quotes (‘ ’)
`<device>`	Drive name `A,B,D,E,F,...` The D drive is used if this is omitted.

Details

This command specifies the parameters in the specified parameter list, performs Modulation Analysis measurement, and then outputs the results.
The value returned by this command differs depending on Result Mode.
(cf. `:SYSTem:RESut:MODE`)

Place parameter list files in a folder on the specified drive.

<device>:\Anritsu Corporation\Signal Analyzer\User Data\Batch

If a parameter list file is changed, `:MMEMory:RELoad:BATCh` must be executed to apply the changes.
(cf. `:MMEMory:RELoad:BATCh`)

Example of Use

To obtain the results of ACP measurement performed using the parameter list file MyParam.xml.

```
MEAS:BATC:EVM? “MyParam”
> 5.20,  1.03,  1, 0.53,  38,  3,  2.34, …
```

2

SCPI Device Message Details

Parameter list file format

An example parameter list file is shown in Table 2.13-2.

Table 2.13-2 Parameter list file example

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- Batch Parameter List XML -->
<SignalAnalyzerProject>
  <ProjectDefine>
    <Attribute Name="Type" Value="Application" />
    <Attribute Name="Name" Value="Batch Parameter List" />
    <Attribute Name="FileVersion" Value="1.0.0.0" />
  </ProjectDefine>
  <Params>
    <LteDlEvmParams Name="LTE_DL_EVM1">
      <CommonParams>
        <Attribute Name="Channel Bandwidth" Value="5MHz" />
        <Attribute Name="Test Model" Value="E-TM3.1" />
        <Attribute Name="Starting Subframe Number" Value="0" />
        <Attribute Name="Measurement Interval" Value="1" />
      </CommonParams>
    </LteDlEvmParams>
  </Params>
</SignalAnalyzerProject>
```

The parameters are specified in the portion enclosed by the `CommonParams` element. In the `Attribute` elements, parameters are specified by specifying their names for the `Name` attributes and their values for the `Value` attributes. The bold portion in Table 2.13-2 is the actual example. The rest of the table must be specified as is.

Because settings are used in order, be careful of the order when specifying parameters that are dependent on each other. If values that are outside the valid range or unusable values are entered, the settings are ignored.

Table 2.13-3 Parameter List File Settings

Parameter	Attribute Name Setting	Attribute Value Setting
Carrier Frequency	"Carrier Frequency"	Value is described in Hz units.
Input Level	"Input Level"	Value is described in 0.01 dB units.
Pre-amp	"Pre-Amp OnOff"	"Off": Off "On": On
Input Level Offset	"Input Level Offset OnOff"	"Off": Off "On": On
Input Level Offset Value	"Offset Value"	Value is described in 0.01 dB units.
Channel Bandwidth	"Channel Bandwidth"	"1.4MHz": 1.4MHz "3MHz": 3MHz "5MHz": 5MHz "10MHz": 10MHz "15MHz": 15MHz "20MHz": 20MHz
Test Model	"Test Model"	"Off": Off "E-TM1.1": E-TM1.1 "E-TM1.2": E-TM1.2 "E-TM2": E-TM2 "E-TM2a": E-TM2a "E-TM3.1": E-TM3.1 "E-TM3.1a": E-TM3.1a "E-TM3.2": E-TM3.2 "E-TM3.3": E-TM3.3
Synchronization Mode	"Synchronization Mode"	"Synchronization Signal": Synchronization Signal "Off": Off
Reference Signal Mode	"Reference Signal Mode"	"Auto": Auto "Using Cell ID": Using Cell ID
Reference Signal Filename	"Reference Signal Filename"	Describes Reference Signal file name.
Frequency Shift	"Frequency Shift"	Describes Frequency Shift.
Cell ID	"Cell ID"	Describes Cell ID.
Power Boosting	"Power Boosting"	Value is described in 0.001 dB units.
Number of Antenna Ports	"Number of Antenna Ports"	Describes number of Antenna Ports.
Antenna Port	"Antenna Port"	Describes Antenna Port.
Starting Subframe Number	"Starting Subframe Number"	Value is described in subframe units.

Table 2.13-3 Parameter List File Settings (Cont'd)

Parameter	Attribute Name Setting	Attribute Value Setting
Measurement Interval	"Measurement Interval"	Value is described in subframe units.
Analysis Frame Position	"Analysis Frame Position"	Value is described in frame units.
Analysis Offset Time	"Analysis Offset Time"	Value is described in ns units.
Modulation	"Modulation"	"QPSK": QPSK "16QAM": 16QAM "64QAM": 64QAM "256QAM": 256QAM "AUTO": AUTO
Total EVM Calculation RS	"Total EVM Calculation RS"	"Include": Include "Exclude": Exclude
Total EVM Calculation PDSCH	"Total EVM Calculation PDSCH"	"Include": Include "Exclude": Exclude
Total EVM Calculation PBCH	"Total EVM Calculation PBCH"	"Include": Include "Exclude": Exclude
Total EVM Calculation P-SS	"Total EVM Calculation P-SS"	"Include": Include "Exclude": Exclude
Total EVM Calculation S-SS	"Total EVM Calculation S-SS"	"Include": Include "Exclude": Exclude
Total EVM Calculation PDCCH	"Total EVM Calculation PDCCH"	"Include": Include "Exclude": Exclude
Total EVM Calculation PCFICH	"Total EVM Calculation PCFICH"	"Include": Include "Exclude": Exclude
Total EVM Calculation PHICH	"Total EVM Calculation PHICH"	"Include": Include "Exclude": Exclude
EVM Window Length	"EVM Window Length"	Value is described in Ts units.
EVM Window Length(W)	"EVM Window Length(W)"	Describes Window Length.
EVM Window Length Type	"EVM Window Length Type"	"W": W "Ts": Ts
PBCH Presence	"PBCH Presence"	"0": Off "1": On
PBCH Power Auto	"PBCH Power Auto"	"Auto": Auto "Manual": Manual
PBCH Power Boosting	"PBCH Power Boosting"	Value is described in 0.001 dB units.
Synchronization Signal Presence	"Synchronization Signal Presence"	"0": Off "1": On
Synchronization Signal Power Auto/Manual	"Synchronization Signal Power Auto"	"Auto": Auto "Manual": Manual
Synchronization Signal Power Boosting	"Synchronization Signal Power Boosting"	Value is described in 0.001 dB units.

Table 2.13-3 Parameter List File Settings (Cont’d)

Parameter	Attribute Name Setting	Attribute Value Setting
S-Synchronization Signal Presence	“S-Synchronization Signal Presence”	“0”: Off “1”: On
S-Synchronization Signal Power Auto/Manual	“S-Synchronization Signal Power Auto”	“Auto”: Auto “Manual”: Manual
S-Synchronization Signal Power Boosting	“S-Synchronization Signal Power Boosting”	Value is described in 0.001 dB units.
PDCCH Presence	“PDCCH Presence”	“0”: Off “1”: On
PDCCH Power Auto/Manual	“PDCCH Power Auto”	“Auto”: Auto “Manual”: Manual
PDCCH Power Boosting	“PDCCH Power Boosting”	Value is described in 0.001 dB units.
PCFICH Presence	“PCFICH Presence”	“0”: Off “1”: On
PCFICH Power Auto/Manual	“PCFICH Power Auto”	“Auto”: Auto “Manual”: Manual
PCFICH Power Boosting	“PCFICH Power Boosting”	Value is described in 0.001 dB units.
PHICH Presence	“PHICH Presence”	“0”: Off “1”: On
PHICH Power Auto/Manual	“PHICH Power Auto”	“Auto”: Auto “Manual”: Manual
PHICH Power Boosting	“PHICH Power Boosting”	Value is described in 0.001 dB units.
PDSCH Power Auto/Manual	“PDSCH Power Auto”	“Auto”: Auto “Manual”: Manual
PDSCH Power Boosting	“PDSCH Power Boosting”	Value is described in 0.001 dB units.
PHICH Ng	“PHICH Ng”	“1/6”: 1/6 “1/2”: 1/2 “1”: 1 “2”: 2
PHICH Duration	“PHICH Duration”	“Extended”: Extended “Normal”: Normal
Number of PDCCH Symbol Auto/Manual	“Number of PDCCH Symbol Auto”	“Auto”: Auto “Manual”: Manual
Number of PDCCH Symbols	“Number of PDCCH Symbols”	Value is described in Symbol units.
PDCCH Mapping	“PDCCH Mapping”	“Easy”: Easy “Full”: Full “Load File”: Load File
PDCCH Format	“PDCCH Format”	Describes PDCCH Format.

Table 2.13-3 Parameter List File Settings (Cont' d)

Parameter	Attribute Name Setting	Attribute Value Setting
Number of PDCCHs	"Number of PDCCHs"	Describes number of PDCCH.
Pseudo-random sequence generation	"Pseudo-random sequence generation"	"R8 V8.2.0(2008-03)": R8 V8.2.0(2008-03) "R8 V8.3.0(2008-05)": R8 V8.3.0(2008-05)
Channel Estimation	"Channel Estimation"	"0": Off "1": On
PDSCH EVM Calculation	"PDSCH EVM Calculation"	"3GPP": 3GPP "All PDSCH Resource Elements": All PDSCH Resource Elements
Capture Time Auto/Manual	"Capture Time"	"Auto": Auto "Manual": Manual
Capture Time Length	"Capture Time Length"	Value is described in frame units.
Storage Mode	"Storage Mode(Modulation)"	"Average": Average "Average & Max": Average & Max "Off": Off
Storage Count	"Storage Count(Modulation)"	Describes number of Storage.
Trigger Switch	"Trigger Switch"	"Off": Off "On": On
Trigger Source	"Trigger Source"	"External": External "SG Marker": SG Marker
Trigger Slope	"Trigger Slope"	"Rise": Rise "Fall": Fall
Trigger Delay	"Trigger Delay"	Value is described in ns units.
IQ pro Load File Filename	"IQ pro Load File Filename"	Describes IQproducer setting file name.

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.

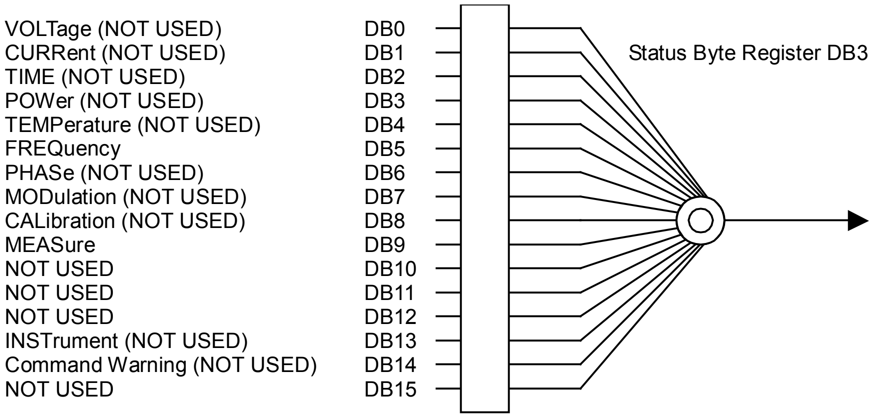

Figure 3.2-1 QUEStionable Status Register

Table 3.2-1 Bit Definition of QUEStionable Status Register

Bit	Definition
DB5	Reference Clock Unlock
DB9	QUEStionable Measure Register Summary

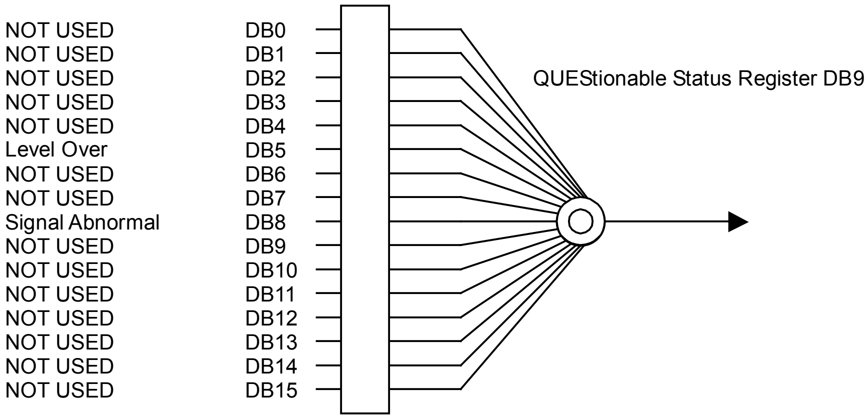

Figure 3.2-2 QUEStionable Measure Register

Table 3.2-2 Bit Definition of QUEStionable Measure Register

Bit	Definition
DB5	Level Over
DB8	Signal Abnormal

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.

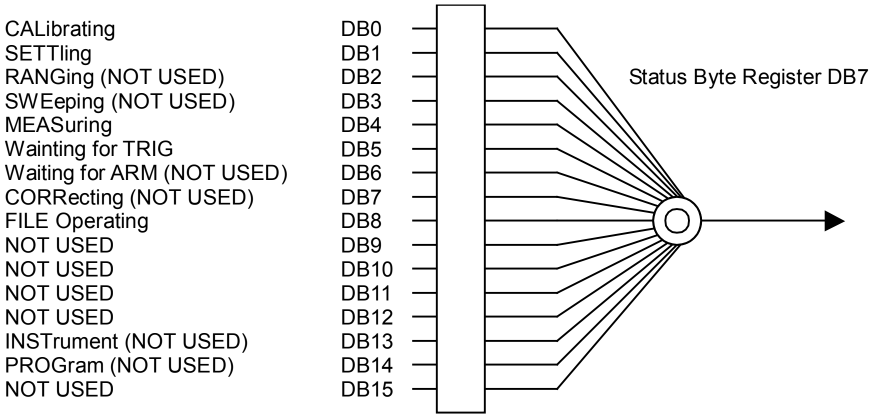

Figure 3.3-1 OPERation Status Register

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
```