MX269021A
LTE Uplink Measurement Software
Operation Manual
Remote Control

14th Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe Operation), MS2830A Signal Analyzer Operation Manual (Mainframe Operation), MS2850A Signal Analyzer Operation Manual (Mainframe Operation) and MX269021A LTE Uplink 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-W3065AE-14.0

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

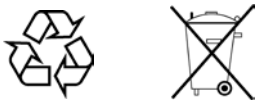
The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

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.

MX269021A
LTE Uplink Measurement Software
Operation Manual Remote Control

7 March 2008 (First Edition)
19 July 2017 (14th Edition)

Copyright © 2008-2017, ANRITSU CORPORATION.
All rights reserved. No part of this manual may be reproduced without the prior written permission of the publisher.
The contents of this manual may be changed without prior notice.
Printed in Japan

Notes On Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

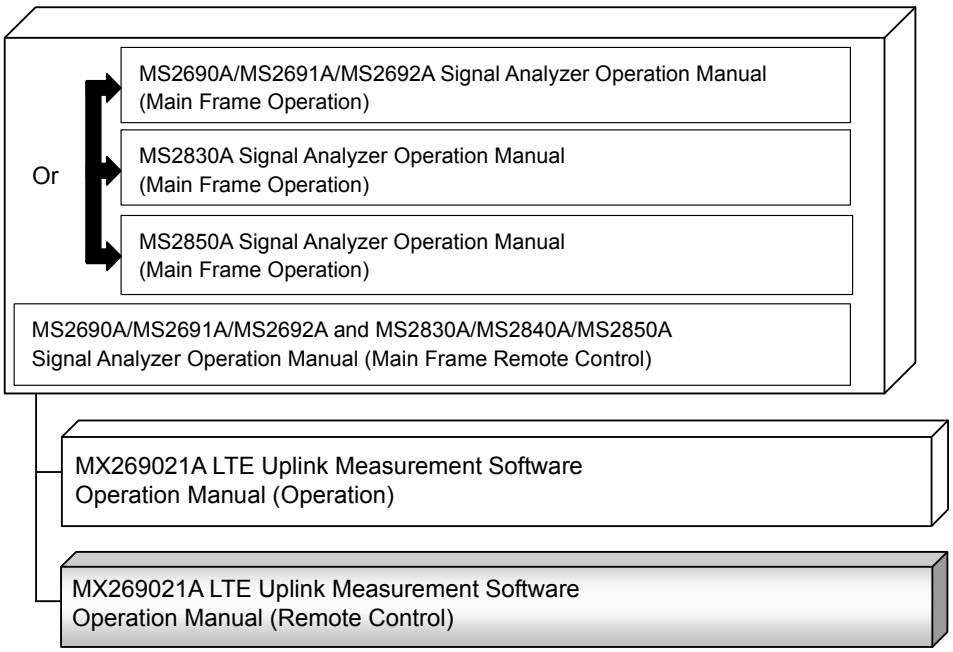
Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

About This Manual

■Composition of Operation Manuals

The operation manuals for MX269021A LTE Uplink 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.

- MX269021A LTE Uplink Measurement Software Operation Manual (Operation)

This manual describes operating methods of the MX269021A LTE Uplink Measurement Software.

- MX269021A LTE Uplink Measurement Software Operation Manual (Remote Control) <This document>

This manual describes remote control of the MX269021A LTE Uplink Measurement Software.

Table of Contents

About This Manual..... I

Chapter 1 Outline 1-1

1.1 Outline..... 1-2
1.2 Basic Flow of Control..... 1-3
1.3 How to use the Native Mode..... 1-23

Chapter 2 SCPI Device Message Details.. 2-1

2.1 Selecting application..... 2-11
2.2 Setting Basic Parameters 2-17
2.3 Setting System Parameters..... 2-34
2.4 Utility Function 2-187
2.5 Common Measurement Function 2-191
2.6 ACP/Channel Power/OBW/SEM Measurement Functions 2-209
2.7 Modulation Measurement Function 2-215
2.8 Power vs Time Measurement Function 2-332
2.9 Measurement Result Saving Function..... 2-357
2.10 Replay Function..... 2-360

Chapter 3 SCPI Status Register..... 3-1

3.1 Reading Measurement Status 3-2
3.2 STATus:QUEStionable Register..... 3-3
3.3 STATus:OPERation Register 3-13

1
2
3

IV.

Chapter 1 Outline

This chapter provides an overview of the remote control of the MX269021A LTE Uplink Measurement Software (hereafter "this application").

1.1 Outline 1-2
1.1.1 Interface 1-2
1.1.2 Controlled Application 1-2
1.2 Basic Flow of Control 1-3
1.2.1 Initialization 1-6
1.2.2 Setting of Basic Parameters 1-8
1.2.3 Setting of Modulation-Common Parameters 1-9
1.2.4 Modulation Measurement 1-11
1.2.5 Power vs Time Measurement 1-13
1.2.6 ACP (Adjacent Channel Power) Measurement 1-15
1.2.7 Channel Power Measurement 1-17
1.2.8 OBW (Occupied Bandwidth) Measurement 1-18
1.2.9 SEM (Spectrum Emission Mask) Measurement 1-19
1.2.10 Signal Analyzer/Spectrum Analyzer Switching 1-20
1.2.11 Saving Measurement Results 1-22
1.3 How to use the Native Mode 1-23

1.1 Outline

This application can be controlled from an external controller (PC) by remote control commands using the MS2690/MS2691/MS2692A, MS2830A or MS2850A Signal Analyzer. Remote control commands for this application are in the SCPI format defined by the SCPI Consortium.

1.1.1 Interface

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

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

Refer to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Mainframe Remote Control)* for more details about remote control and interface setting.

1.1.2 Controlled Application

Two kinds of remote control commands can be used with this instrument: commands that are common to all applications (hereafter common commands), and other commands unique to a specific application. Common commands can be executed at any time and do not depend on the currently controlled application. However, when a command unique to a specific application is executed at another application, the command is not executed and an error occurs.

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

1.2 Basic Flow of Control

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

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

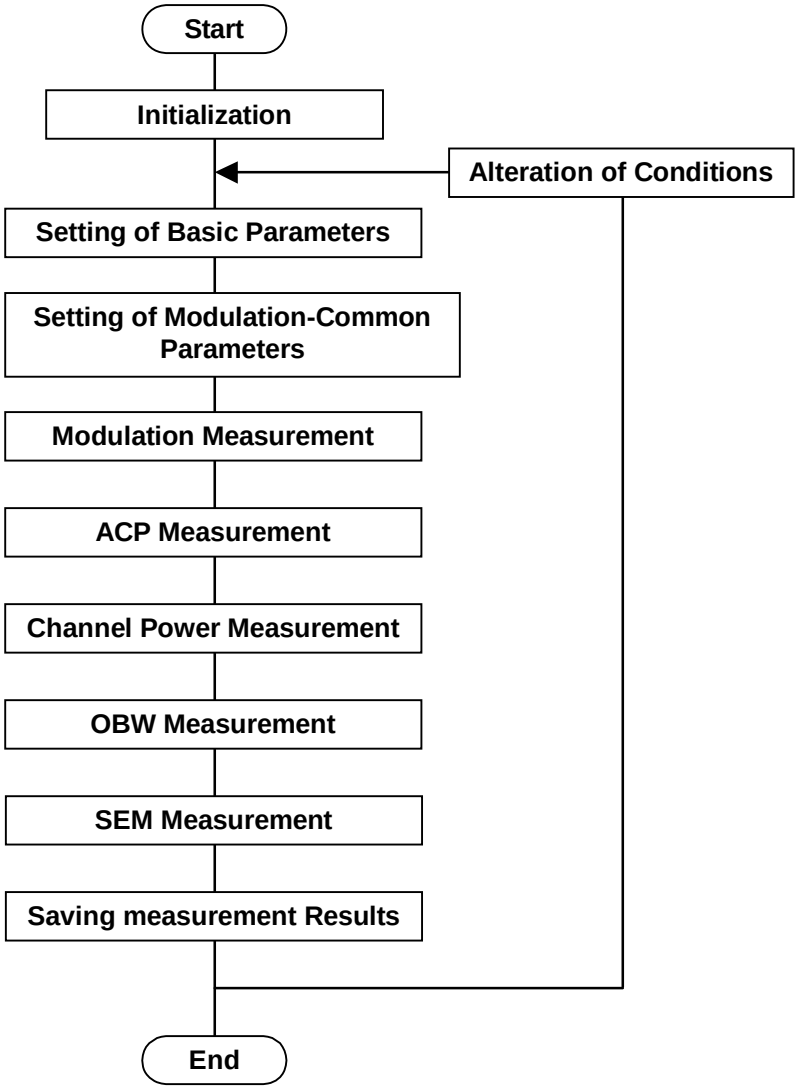


Figure 1.2-1 Flow of Basic Test

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

☞ 1.2.1 Initialization

(2) Setting of Basic Parameters
The parameters used in common by all measurement functions to be executed in this application are set, including the carrier frequency and input level.

☞ 1.2.2 Setting of Basic Parameters

(3) Setting of Modulation-Common Parameters
The parameters used in common by the modulation measurement function to be executed in this application are set. These parameters are used to set a trigger, modulation mode, bandwidth, and other items.

☞ 1.2.3 Setting of Modulation-Common Parameters

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

☞ 1.2.4 Modulation Measurement

(5) Power vs Time Measurement
The 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.

☞ 1.2.5 Power vs Time 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/MS2850A Signal Analyzer Operation Manual (Mainframe Remote Control)* for details about the language mode and response mode.

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

(4) Selecting Application
The application is selected.

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

(6) Setting Measurement Mode
After initialization, the measurement mode is at continuous measurement mode. To select single measurement mode, switch to the single measurement mode.

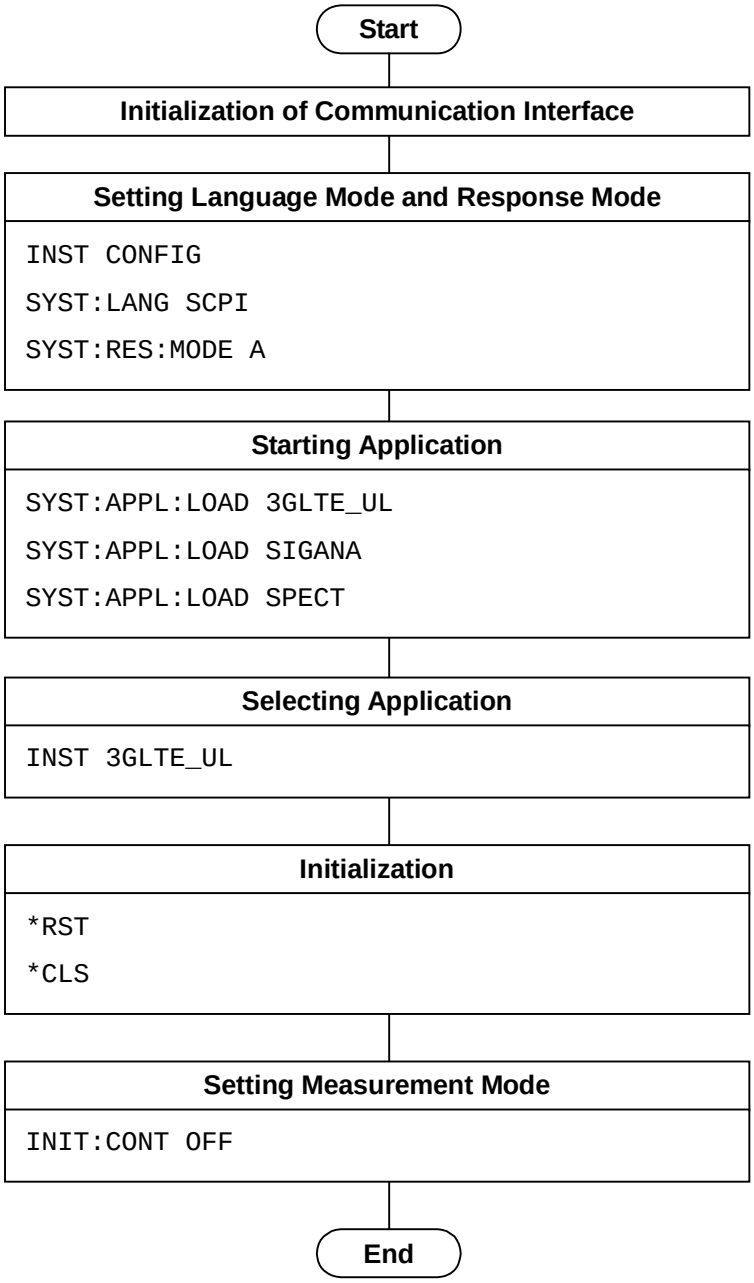


Figure. 1.2.1-1 Initialization Flow and Command Example

1.2.2 Setting of Basic Parameters

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

(1) Carrier Frequency

(2) Input Level (Reference Level/Attenuator)

(3) Level Offset

(4) Pre-Amp (Option)

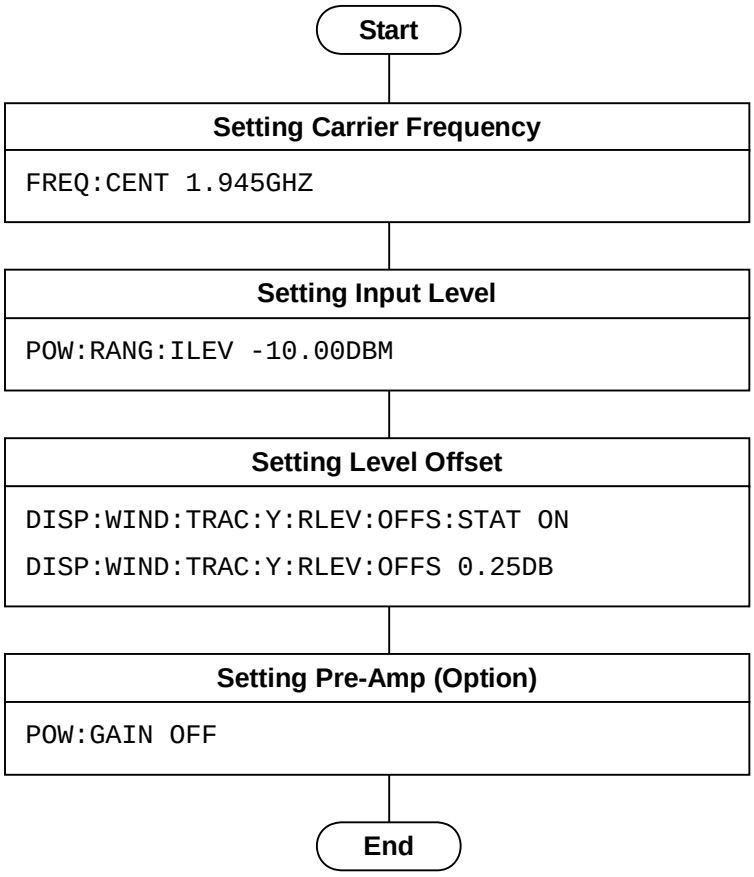


Figure 1.2.2-1 Flow of Basic Parameter Setting and Command Example

1.2.3 Setting of Modulation-Common Parameters

Set the parameters used in common for the Modulation measurement functions executed in this application. Unless specified, there is no specific parameter setting order.

(1) Trigger
  (a) Trigger Switch
  (b) Trigger Source
  (c) Trigger Slope
  (d) Trigger Delay
(2) Channel Bandwidth
(3) PUSCH Modulation Scheme
(4) Reference Signal
  (a) Zadoff-Chu-Sequence Length
  (b) Sequence Group Number
  (c) Base Sequence Number
  (d) Cyclic Shift
(5) EVM Window Length
(6) Resource Block
  (a) First RB Number
  (b) Number of RBs
(7) Channel Estimation

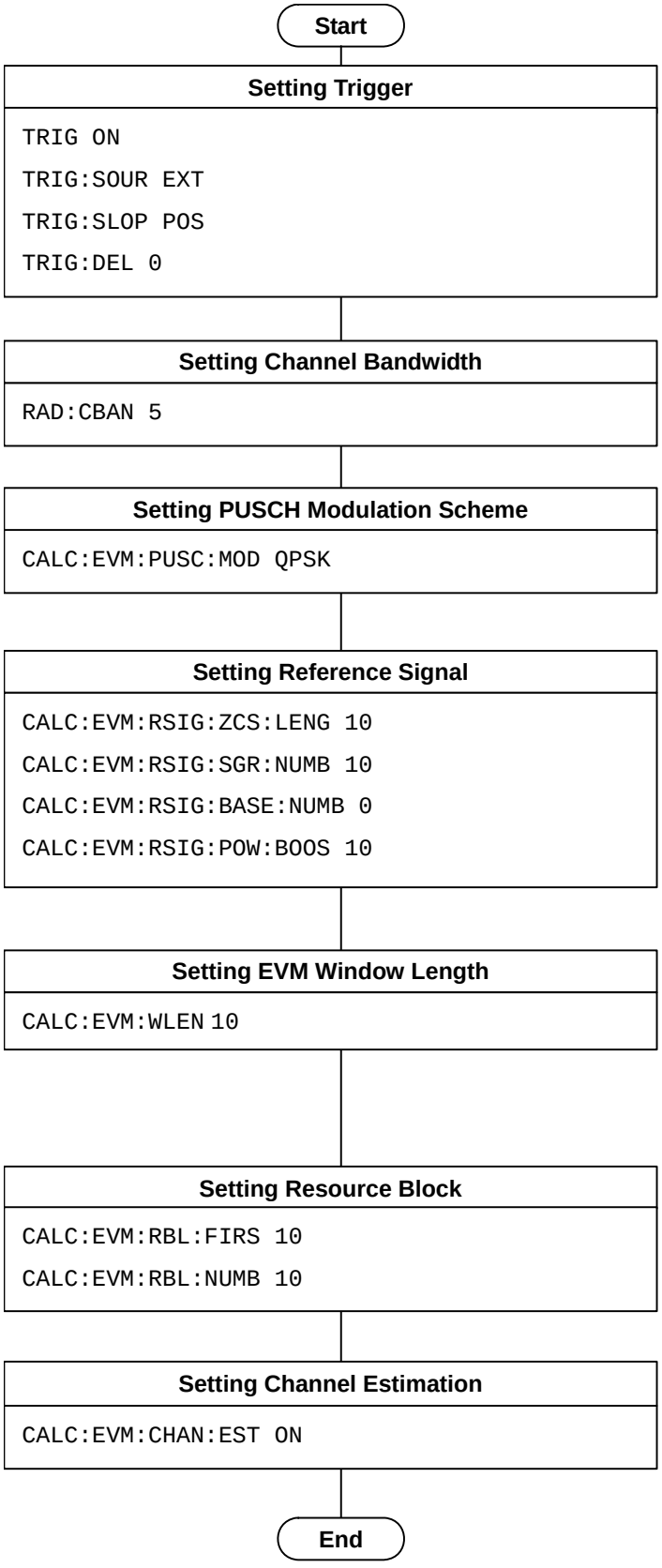


Figure 1.2.3-1 Flow of Common Settings for Modulation and Command Example

1.2.4 Modulation Measurement

The Modulation measurement is executed in the following order:

(1) Selecting measurement function

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

(a) Starting Subframe Number

(b) Measurement Interval

(c) Storage

(3) Measuring and reading results

(4) Set the display content
This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.

(a) Trace Mode

(b) Scale

(c) Target Number

(d) Marker

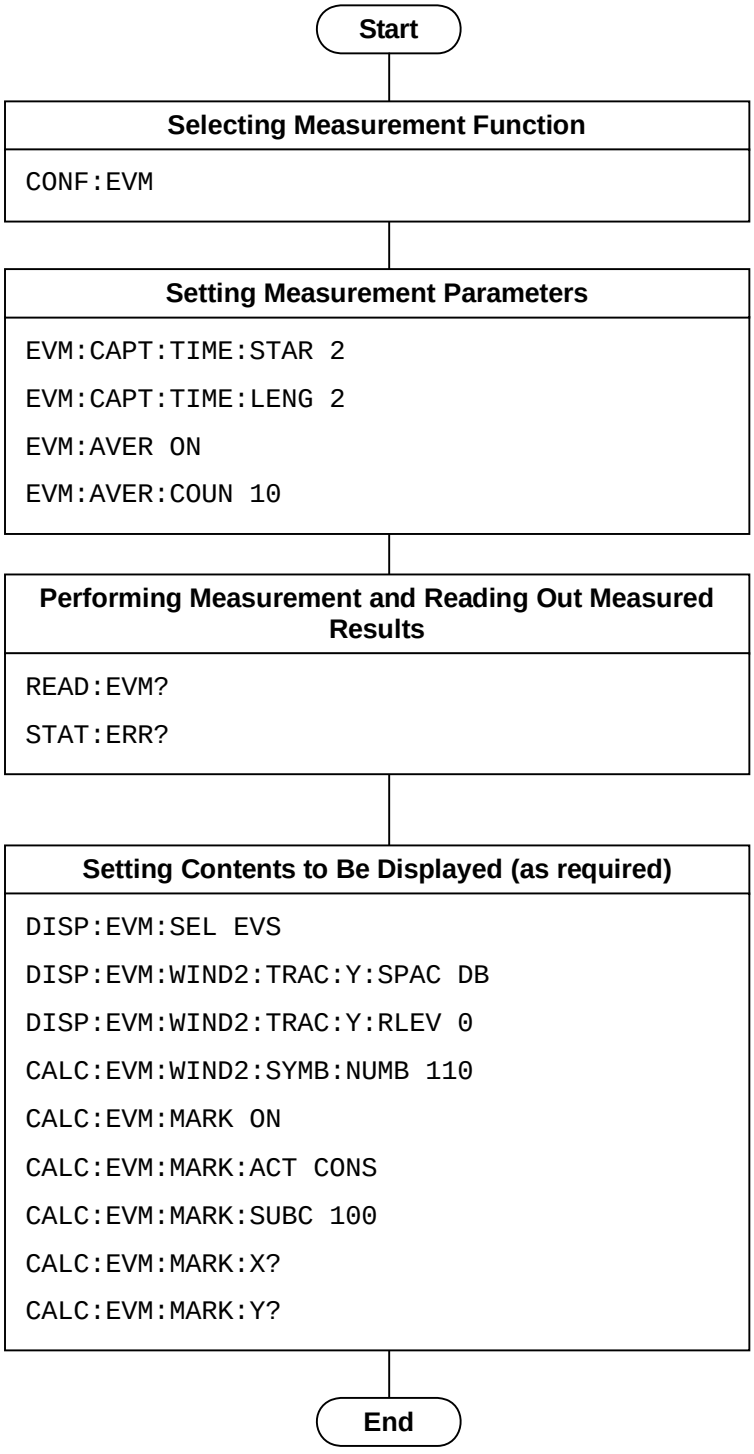


Figure 1.2.4-1 Flow of Modulation Measurement and Command Example

1.2.5 Power vs Time Measurement

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

(1) Selecting measurement function

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

(a) Starting Subframe Number

(b) Measurement Interval

(c) Storage

(3) Measuring and reading results

(4) Set the display content
This setting is required for displaying measured results on the screen, in a manner similar to the manual operation, although it is not necessary when only reading out measured results through remote control.

(a) Trace Mode

(b) Scale

(c) Marker

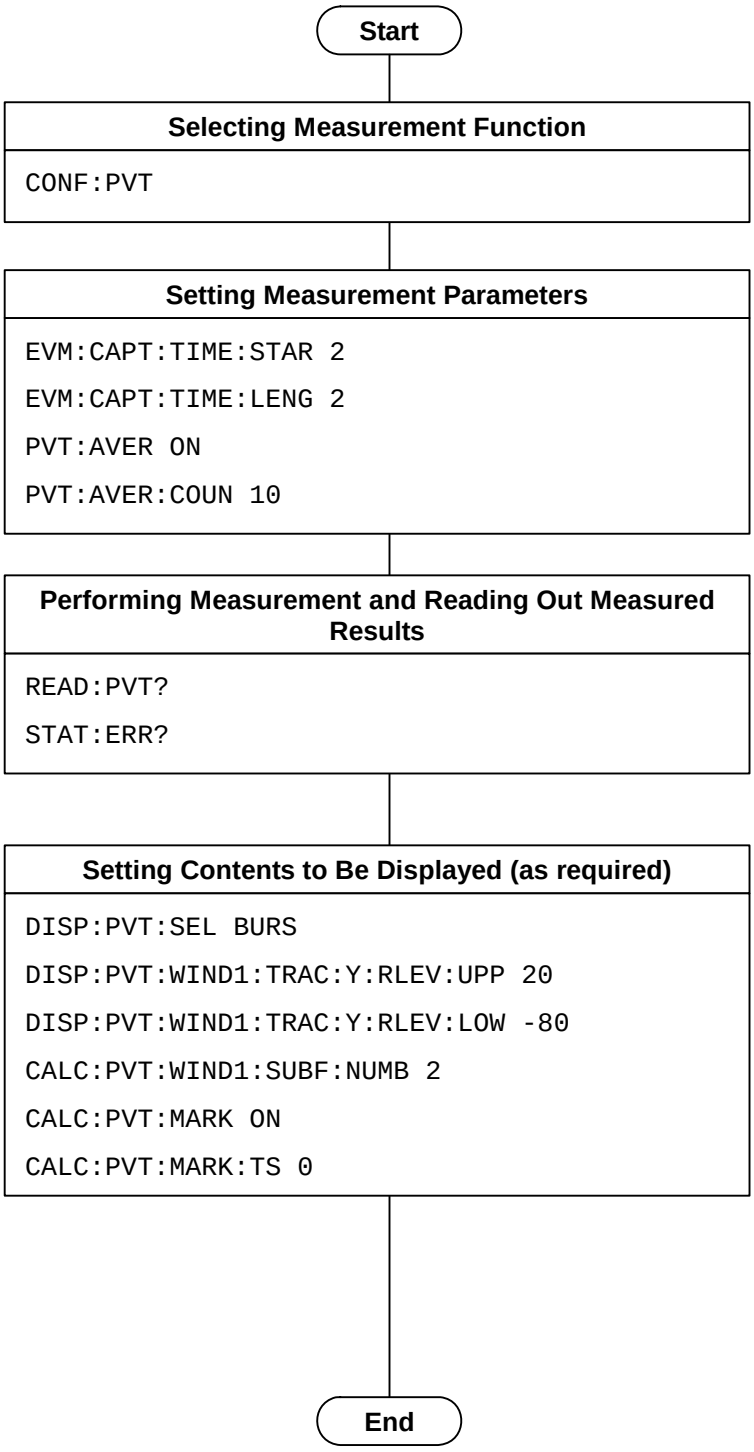


Figure 1.2.5-1 Flow of Power vs Time Measurement and Command Example

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 Signal 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.

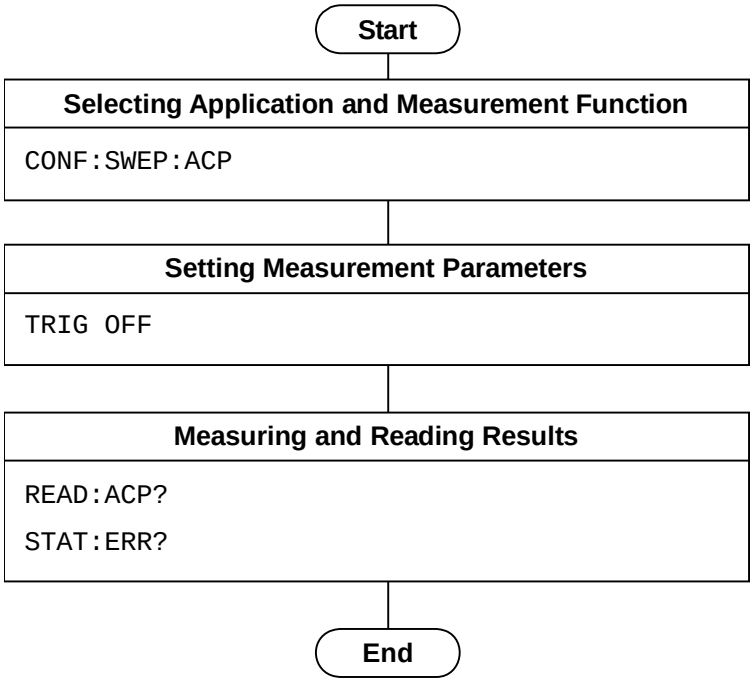


Figure 1.2.6-1 Flow of ACP Measurement using Spectrum Analyzer and Command Example

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.

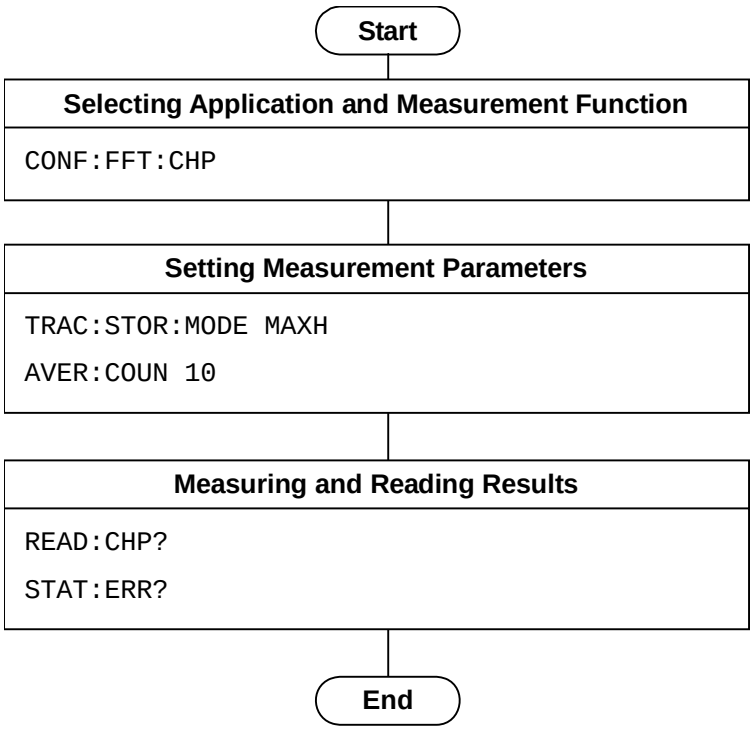


Figure 1.2.7-1 Flow of Channel Power Measurement using Signal Analyzer and Command Example

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.

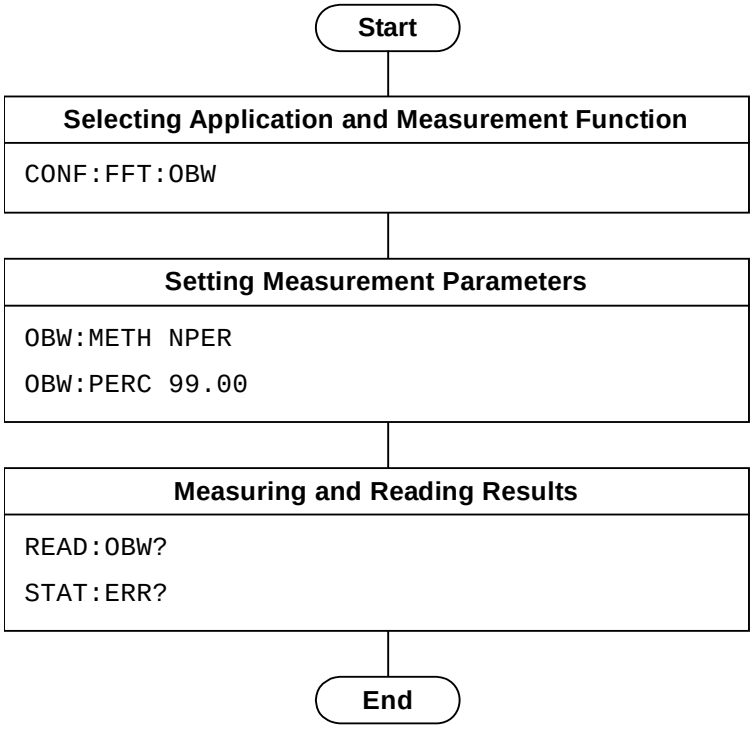


Figure 1.2.8-1 Flow of OBW Measurement using Signal Analyzer and Command Example

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.

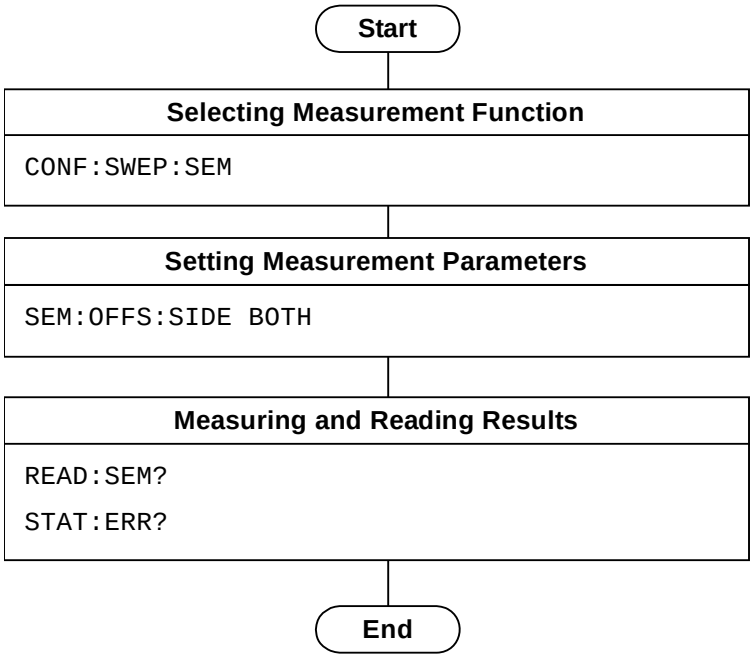


Figure 1.2.9-1 Flow of SEM Measurement using Spectrum Analyzer and Command Example

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

Note:

It is not likely to be able to execute it by selecting application and the measurement function to use. 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 `CONFigureure:FFT|SWEPt:<measure>.` In the same way, the template and the basic parameters such as the carrier frequency/input level (reference level) are reflected.

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

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

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

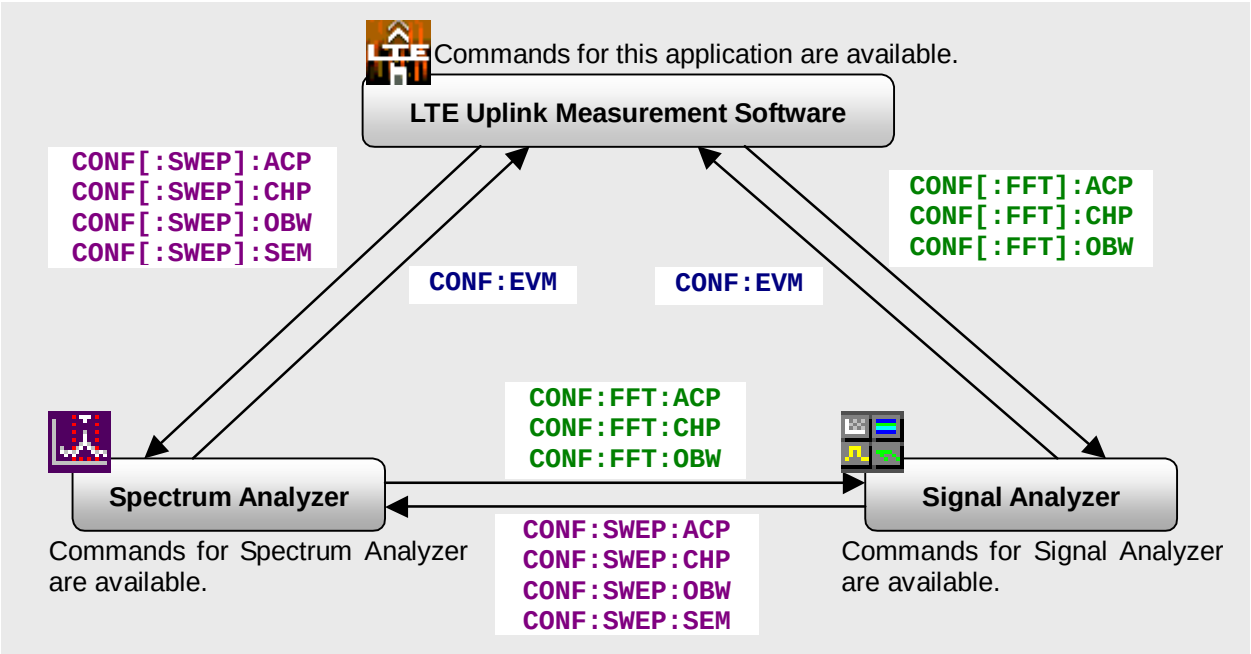


Figure 1.2.10-1 Switching of Measurement Functions among Applications

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 file format to save.

(2) Saving measurement results
Specify the drive and file name of the save destination as necessary.
All measurement results of the MX269021A are saved.

Note:

When a file name is not specified, the saved file is output under the name format of "LTEUL*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 "LTEUL*date*_00.xml," "LTEUL*date*_01.xml," "LTEUL*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 Uplink

Up to 1000 files can be saved in the folder.

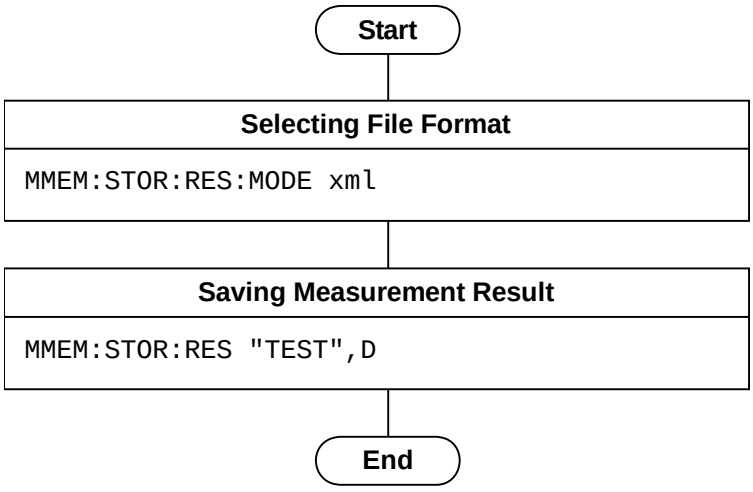


Figure 1.2.11-1 Saving Measurement Results Flow and Command Example

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

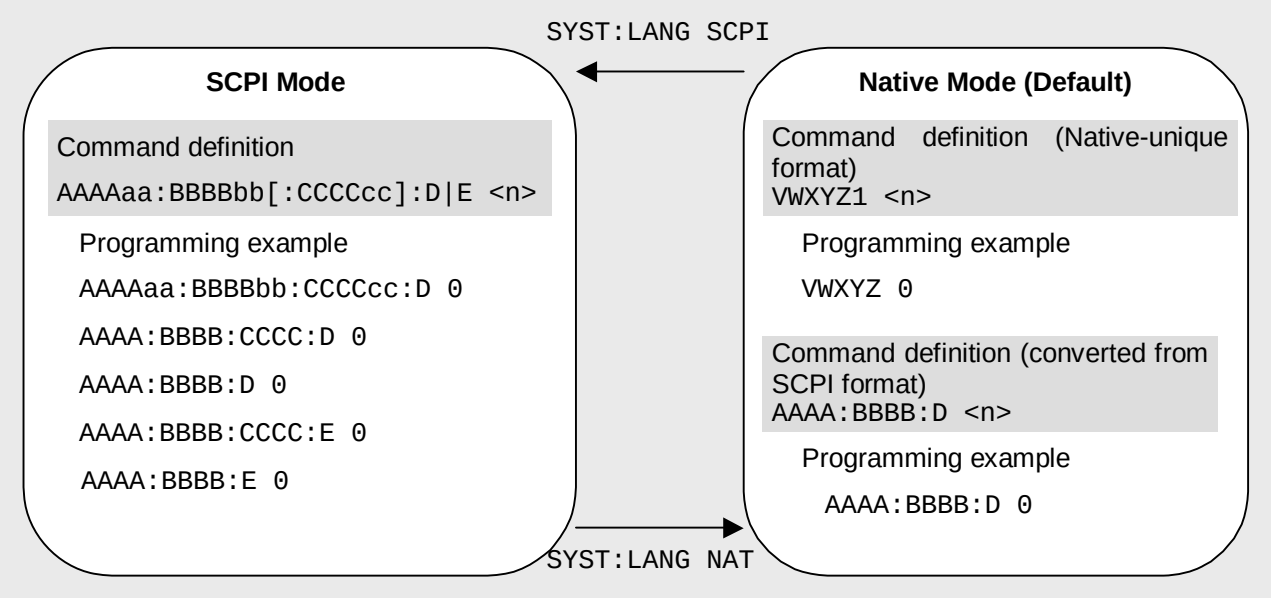


Figure 1.3-1 SCPI mode and Native mode

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. Put a numeric parameter in the program header of the SCPI mode at the head of the 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`

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/MS2850A 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 2-11
2.1.1 Loading application 2-12
:SYSTem:APPLication:LOAD 3GLTE_UL 2-12
:SYSTem:APPLication:UNLoad 3GLTE_UL 2-12
2.1.2 Selecting Application 2-13
:INSTrument[:SELect] 3GLTE_UL|CONFIG 2-13
:INSTrument[:SELect]? 2-14
:INSTrument:SYSTem 3GLTE_UL [ACTive]|INACtive|MINimum 2-15
:INSTrument:SYSTem? 3GLTE_UL 2-15
2.1.3 Initialization 2-16
:INSTrument:DEFault 2-16
:SYSTem:PRESet 2-16
2.2 Setting Basic Parameters 2-17
2.2.1 Carrier Frequency 2-18
[:SENSe]:FREQuency:CENTer <freq> 2-18
[:SENSe]:FREQuency:CENTer? 2-19
2.2.2 Frequency Span 2-20
[:SENSe]:FREQuency:SPAN AUTO|<freq> 2-20
[:SENSe]:FREQuency:SPAN? 2-21
2.2.3 Operating Band Setting 2-22
:CALCulation:OBANd:FREQuency:SETTing STANdard|USER 2-22
:CALCulation:OBANd:FREQuency:SETTing? 2-22
2.2.4 Operating Band Number 2-23
:CALCulation:OBANd <integer> 2-23
:CALCulation:OBANd? 2-23
2.2.5 Operating Band Lowest Frequency 2-24
:CALCulation:OBANd:FREQuency:LOWest <freq> 2-24
:CALCulation:OBANd:FREQuency:LOWest? 2-24
2.2.6 Operating Band Highest Frequency 2-25
:CALCulation:OBANd:FREQuency:HIGHest <freq> 2-25
:CALCulation:OBANd:FREQuency:HIGHest? 2-25
2.2.7 Input Level 2-26
[:SENSe]:POWer[:RF]:RANGe:ILEVel <real> 2-26
[:SENSe]:POWer[:RF]:RANGe:ILEVel? 2-27
2.2.8 Reference Level 2-28
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real> 2-28
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel? 2-29
2.2.9 Level Offset 2-30
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power> 2-30
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet? 2-30
2.2.10 Level Offset State 2-31

:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1 2-31
:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe? 2-31
2.2.11 Pre Amp State 2-32
[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1 2-32
[:SENSe]:POWer[:RF]:GAIN[:STATe]? 2-32
2.2.12 Lowest ATT Setting 2-33
[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing 0dB|4dB 2-33
[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing? 2-33
2.3 Setting System Parameters 2-34
2.3.1 Standard 2-40
[:SENSe]:RADio:STANdard LTE|LTEA 2-40
[:SENSe]:RADio:STANdard? 2-40
2.3.2 Contiguous Mode 2-41
[:SENSe]:RADio:CONTiguous OFF|ON|0|1 2-41
[:SENSe]:RADio:CONTiguous? 2-41
2.3.3 Number of CCs 2-42
[:SENSe]:RADio:CC:NUMBer <integer> 2-42
[:SENSe]:RADio:CC:NUMBer? 2-42
2.3.4 Synchronization CC# 2-43
[:SENSe]:RADio:SYNChronization:CC 0|1|EACH 2-43
[:SENSe]:RADio:SYNChronization:CC? 2-43
2.3.5 Setting/Result Target CC# 2-44
[:SENSe]:RADio:TCC 0|1 2-44
[:SENSe]:RADio:TCC? 2-44
2.3.6 In-Band Emission Carrier Leakage Frequency 2-45
[:SENSe]:RADio:CLFRequency:IBEMission CFRequency|CCCenter 2-45
[:SENSe]:RADio:CLFRequency:IBEMission? 2-45
2.3.7 Carrier Leak Rejection 2-46
[:SENSe]:RADio:CLEak:REJection:CFRequency OFF|ON|0|1 2-46
[:SENSe]:RADio:CLEak:REJection:CFRequency? 2-46
[:SENSe]:RADio:CLEak:REJection:CCCenter OFF|ON|0|1 2-48
[:SENSe]:RADio:CLEak:REJection:CCCenter? 2-48
2.3.8 CC Status 2-50
[:SENSe]:RADio:CC[:STATe] OFF|ON|0|1 2-50
[:SENSe]:RADio:CC[:STATe]? 2-51
2.3.9 CC Frequency Offset 2-52
[:SENSe]:RADio:CC:FREQunecy:OFFSet <freq_0>,<freq_1> 2-52
[:SENSe]:RADio:CC:FREQunecy:OFFSet? 2-53
2.3.10 Channel Bandwidth 2-54
[:SENSe]:RADio:CBANdwidth 20|15|10|5|3|1M4 2-54
[:SENSe]:RADio:CBANdwidth? 2-55
2.3.11 Target Channel 2-56
[:SENSe]:RADio:TCHannel:PUSCh INCLude|EXCLude 2-56
[:SENSe]:RADio:TCHannel:PUSCh? 2-56
[:SENSe]:RADio:TCHannel:PUCCh INCLude|EXCLude 2-57
[:SENSe]:RADio:TCHannel:PUCCh? 2-57
[:SENSe]:RADio:TCHannel:PRACh INCLude|EXCLude 2-58
[:SENSe]:RADio:TCHannel:PRACh? 2-58
[:SENSe]:RADio:TCHannel:SRSignal INCLude|EXCLude 2-59
[:SENSe]:RADio:TCHannel:SRSignal? 2-59
2.3.12 Reference Signal 2-60
:CALCulate:EVM:RSIGnal:ZCSequence:LENGth <integer> 2-60
:CALCulate:EVM:RSIGnal:ZCSequence:LENGth? 2-61

:CALCulate:EVM:RSIGnal:SGRoup:NUMBer <integer> 2-62
:CALCulate:EVM:RSIGnal:SGRoup:NUMBer? 2-63
:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer <integer> 2-64
:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer? 2-65
:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer> 2-66
:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19? 2-67
2.3.13 Reference Signal PUSCH 2-68
:CALCulate:EVM:PUSCh:RSIGnal:AUTO OFF|ON|0|1 2-68
:CALCulate:EVM:PUSCh:RSIGnal:AUTO? 2-68
:CALCulate:EVM:PUSCh:RSIGnal:CELLid <integer> 2-69
:CALCulate:EVM:PUSCh:RSIGnal:CELLid? 2-69
:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2 <integer> 2-70
:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2? 2-71
:CALCulate:EVM:PUSCh:RSIGnal:DSS <integer> 2-72
:CALCulate:EVM:PUSCh:RSIGnal:DSS? 2-72
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing OFF|ON|0|1 2-73
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing? 2-74
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1 2-75
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing? 2-75
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth <integer> 2-76
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth? 2-77
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-78
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-79
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer> 2-80
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19? 2-81
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer> 2-82
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19? 2-83
:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer> 2-84
:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19? 2-85
[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1 2-86
[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-86
[:SENSe]:RADio:PUSCh:ASSignment OFF|ON|0|1 2-87
[:SENSe]:RADio:PUSCh:ASSignment? 2-87
2.3.14 Reference Signal PUCCH 2-88
:CALCulate:EVM:PUCCh:RSIGnal:AUTO OFF|ON|0|1 2-88
:CALCulate:EVM:PUCCh:RSIGnal:AUTO? 2-88
:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth <integer> 2-89
:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth? 2-90
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer> 2-91
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19? 2-92
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol1|2|3|4|5|8|9|10|11|12|13 <integer> 2-93
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol1|2|3|4|5|8|9|10|11|12|13? 2-94
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer> 2-95
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13? 2-96
:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|

18|19 <integer> 2-97
:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|
18|19?..... 2-98
:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|
17|18|19 <integer> 2-99
:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|
17|18|19?..... 2-100
:CALCulate:EVM:PUCCh:RSIGnal:CELLid <integer> 2-101
:CALCulate:EVM:PUCCh:RSIGnal:CELLid? 2-102
:CALCulate:EVM:PUCCh:RSIGnal:NCS1 <integer> 2-103
:CALCulate:EVM:PUCCh:RSIGnal:NCS1?..... 2-104
:CALCulate:EVM:PUCCh:RSIGnal:NRB2 <integer> 2-105
:CALCulate:EVM:PUCCh:RSIGnal:NRB2?..... 2-106
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2 <integer>..... 2-107
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2? 2-108
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-109
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9?..... 2-110
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-111
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9?..... 2-112
:CALCulate:EVM:PUCCh:RSIGnal:DSHift <integer>..... 2-113
:CALCulate:EVM:PUCCh:RSIGnal:DSHift?..... 2-113
[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1..... 2-114
[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-114
[:SENSe]:RADio:PUCCh:ASSignment OFF|ON|0|1 2-115
[:SENSe]:RADio:PUCCh:ASSignment?..... 2-115
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1..... 2-116
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing? 2-116
2.3.15 PRACH 2-117
:CALCulate:EVM:PRACh:CONFiguration <integer>..... 2-117
:CALCulate:EVM:PRACh:CONFiguration? 2-117
:CALCulate:EVM:PRACh:PRSequence:NUMBer <integer>..... 2-118
:CALCulate:EVM:PRACh:PRSequence:NUMBer?..... 2-118
:CALCulate:EVM:PRACh:CSHift <integer>..... 2-119
:CALCulate:EVM:PRACh:CSHift?..... 2-119
2.3.16 Sounding Reference Signal..... 2-120
:CALCulate:EVM:SRSignal:AUTO OFF|ON|0|1..... 2-120
:CALCulate:EVM:SRSignal:AUTO? 2-120
:CALCulate:EVM:SRSignal:ZCSequence:LENGth <integer>..... 2-121
:CALCulate:EVM:SRSignal:ZCSequence:LENGth? 2-122
:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>..... 2-123
:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-124
:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>..... 2-125
:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?..... 2-126
:CALCulate:EVM:SRSignal:CSHift <integer> 2-127
:CALCulate:EVM:SRSignal:CSHift?..... 2-127
:CALCulate:EVM:SRSignal:TCOMb <integer> 2-128
:CALCulate:EVM:SRSignal:TCOMb?..... 2-128
:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration <integer> 2-129
:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration?..... 2-130
:CALCulate:EVM:SRSignal:BANDwidth <integer> 2-131
:CALCulate:EVM:SRSignal:BANDwidth?..... 2-131
:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration <integer>..... 2-132
:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration? 2-132
:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1 2-133
:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9?..... 2-134
:CALCulate:EVM:SRSignal:DSS <integer> 2-135
:CALCulate:EVM:SRSignal:DSS?..... 2-135

:CALCulate:EVM:SRSignal:CELLid <integer> 2-136
:CALCulate:EVM:SRSignal:CELLid? 2-136
:CALCulate:EVM:SRSignal:SGRoup:HOPPing OFF|ON|0|1 2-137
:CALCulate:EVM:SRSignal:SGRoup:HOPPing? 2-137
:CALCulate:EVM:SRSignal:BSEQuence:HOPPing OFF|ON|0|1 2-138
:CALCulate:EVM:SRSignal:BSEQuence:HOPPing? 2-138
2.3.17 Starting Subframe Number 2-139
[:SENSe]:EVM:CAPTure:TIME:STARt <integer> 2-139
[:SENSe]:EVM:CAPTure:TIME:STARt? 2-139
2.3.18 Measurement Interval 2-140
[:SENSe]:EVM:CAPTure:TIME:LENGth <integer> 2-140
[:SENSe]:EVM:CAPTure:TIME:LENGth? 2-140
2.3.19 Modulation Scheme 2-141
:CALCulate:EVM:PUSCh:MODulation QPSK|16Qam|64Qam|AUTO 2-141
:CALCulate:EVM:PUSCh:MODulation? 2-142
2.3.20 PUCCH Format 2-143
:CALCulate:EVM:PUCCh:FORMat 1|1A|1B|2|2B|2B|3 2-143
:CALCulate:EVM:PUCCh:FORMat? 2-144
2.3.21 Analysis Offset Time 2-145
[:SENSe]:EVM:CAPTure:TIME:OFFSet <time> 2-145
[:SENSe]:EVM:CAPTure:TIME:FPOSition? 2-145
2.3.22 EVM Window Length 2-146
:CALCulate:EVM:WLENgth <integer> 2-146
:CALCulate:EVM:WLENgth? 2-147
:CALCulate:EVM:WLENgth:W <integer> 2-148
:CALCulate:EVM:WLENgth:W? 2-149
:CALCulate:EVM:WLENgth:TYPE TS|W 2-150
:CALCulate:EVM:WLENgth:TYPE? 2-150
2.3.23 Channel Estimation 2-151
:CALCulate:EVM:CHANnel:ESTimation OFF|ON|0|1 2-151
:CALCulate:EVM:CHANnel:ESTimation? 2-151
2.3.24 Equalization Mode 2-152
:CALCulate:EVM:EQUalization 200906|200909|DMRS 2-152
:CALCulate:EVM:FEQualization:TABLe? 2-152
2.3.25 Exclusion Period 2-153
:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1 2-153
:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-154
2.3.26 Leading Exclusion Period 2-155
:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time> 2-155
:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-156
2.3.27 Lagging Exclusion Period 2-157
:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time> 2-157
:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-158
2.3.28 Channel Bandwidth Selective Filter 2-159
[:SENSe]:RADio:CBANdwidth:FILTer OFF|ON|0|1 2-159
[:SENSe]:RADio:CBANdwidth:FILTer? 2-159
2.3.29 RB Type of In-Band Emission Query 2-160
:CALCulate:EVM:WINDow11:RBLock:TYPE? 2-160
2.3.30 Delta RB of In-Band Emission Query 2-161
:CALCulate:EVM:WINDow11:RBLock:DELTa? 2-161
2.3.31 RB Setting 2-162
:CALCulate:EVM:RBLock:FIRSt <integer> 2-162
:CALCulate:EVM:RBLock:FIRSt? 2-164

:CALCulate:EVM:RBLock:NUMBer <integer> 2-166
:CALCulate:EVM:RBLock:NUMBer? 2-168
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt <integer> 2-169
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt? 2-170
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-171
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-172
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer <integer> 2-173
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer? 2-174
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-175
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-176
:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt <integer> 2-177
:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt? 2-178
:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer> 2-179
:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9? 2-180
:CALCulate:EVM:PRACh:FREQuency:OFFSet <integer> 2-181
:CALCulate:EVM:PRACh:FREQuency:OFFSet? 2-182
:CALCulate:EVM:SRSignal:RBLock:NUMBer <integer> 2-183
:CALCulate:EVM:SRSignal:RBLock:NUMBer? 2-184
:CALCulate:EVM:SRSignal:RBLock:FIRSt <integer> 2-185
:CALCulate:EVM:SRSignal:RBLock:FIRSt? 2-186
2.4 Utility Function 2-187
2.4.1 Erase Warm Up Message 2-188
:DISPlay:ANNotation:WUP:ERASe 2-188
2.4.2 Display Title 2-189
:DISPlay:ANNotation:TITLe[:STATe] OFF|ON|0|1 2-189
:DISPlay:ANNotation:TITLe[:STATe]? 2-189
2.4.3 Title Entry 2-190
:DISPlay:ANNotation:TITLe:DATA <string> 2-190
:DISPlay:ANNotation:TITLe:DATA? 2-190
2.5 Common Measurement Function 2-191
2.5.1 Measurement and Control 2-192
:INITiate:CONTinuous OFF|ON|0|1 2-192
:INITiate:CONTinuous? 2-192
:INITiate:MODE:CONTinuous 2-193
:INITiate:MODE:SINGle 2-193
:INITiate[:IMMediate] 2-193
:INITiate:CALCulate 2-194
:CONFigure? 2-195
:MMEMory:STORe:IQData <filename>,<device> 2-196
:MMEMory:STORe:IQData:CANCel 2-196
:MMEMory:STORe:IQData:RATE <freq> 2-197
:MMEMory:STORe:IQData:RATE? 2-198
[:SENSe]:SWEep:TIME:AUTO ON|OFF|1|0 2-199
[:SENSe]:SWEep:TIME:AUTO? 2-199
[:SENSe]:SWEep:TIME <time> 2-200
[:SENSe]:SWEep:TIME? 2-201
2.5.2 Trigger Switch 2-202
:TRIGger[:SEQuence][:STATe] OFF|ON|0|1 2-202
:TRIGger[:SEQuence][:STATe]? 2-202
2.5.3 Trigger Source 2-203
:TRIGger[:SEQuence]:SOURce EXTernal[1|2]|EXT2|IMMediate|SG|VIDeo 2-203
:TRIGger[:SEQuence]:SOURce? 2-204
2.5.4 Trigger Slope 2-205
:TRIGger[:SEQuence]:SLOPe POSitive|NEGative 2-205
:TRIGger[:SEQuence]:SLOPe? 2-205

2.5.5 Trigger Delay 2-206
:TRIGger[:SEQuence]:DELay <time> 2-206
:TRIGger[:SEQuence]:DELay? 2-207
2.5.6 Video Trigger Level 2-208
:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <power> 2-208
:TRIGger[:SEQuence]:VIDeo:LEVel[LOGarithmic]? 2-208
2.6 ACP/Channel Power/OBW/SEM Measurement Functions 2-209
:CONFigure[:FFT|SWEPt]:ACP 2-210
:CONFigure[:FFT|SWEPt]:CHPower 2-210
:CONFigure[:FFT|SWEPt]:OBWidth 2-211
:CONFigure[:SWEPt]:SEMask 2-211
[:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt 2-212
[:SENSe]:ACPower:INSTrument[:SELect]? 2-212
[:SENSe]:CHPower:INSTrument[:SELect] FFT|SWEPt 2-213
[:SENSe]:CHPower:INSTrument[:SELect]? 2-213
[:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEPt 2-214
[:SENSe]:OBWidth:INSTrument[:SELect]? 2-214
2.7 Modulation Measurement Function 2-215
2.7.1 Measure 2-266
:CONFigure:EVM 2-266
:INITiate:EVM 2-266
:FETCh:EVM[n]? 2-267
:READ:EVM[n]? 2-269
:MEASure:EVM[n]? 2-270
2.7.2 Storage Mode 2-271
[:SENSe]:EVM:AVERage[:STATe] OFF|ON|AMAXimum|0|1|2 2-271
[:SENSe]:EVM:AVERage[:STATe]? 2-272
2.7.3 Storage Count 2-273
[:SENSe]:EVM:AVERage:COUNt <integer> 2-273
[:SENSe]:EVM:AVERage:COUNt? 2-274
2.7.4 Scale - EVM Unit 2-275
:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10:TRACe:Y[:SCALe]:SPACing
LINear|LOGarithmic|PERCent|DB 2-275
:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10:TRACe:Y[:SCALe]:SPACing? 2-275
2.7.5 Scale - EVM 2-276
:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel 2|5|10|20|-40|-20|0 2-276
:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel? 2-277
2.7.6 Scale - Flatness 2-278
:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 10|3|1|0.3|0.1|60|20|6|500|100|50 2-278
:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel? 2-279
2.7.7 Trace Mode 2-280
:DISPlay:EVM[:VIEW]:SELect
EVSubcarrier|EVSYmbol|TBEvm|EVDemod|FLATness|IBEmission|SUMMary 2-280
:DISPlay:EVM[:VIEW]:SELect? 2-281
2.7.8 Spectral Flatness Type 2-282
:CALCulate:EVM:WINDow4:TYPE AMPLitude|DAMPlitude|PHASe|GDELay 2-282
:CALCulate:EVM:WINDow4:TYPE? 2-282
2.7.9 In-band Emission Type 2-283
:CALCulate:EVM:WINDow11:TYPE GI|DC 2-283
:CALCulate:EVM:WINDow11:TYPE? 2-283
2.7.10 Graph View Setting 2-284
:CALCulate:EVM:WINDow2:MODE EACH|AVERage 2-284
:CALCulate:EVM:WINDow2:MODE? 2-285

:CALCulate:EVM:WINDow2:GVIew RMS|RPEak 2-286
:CALCulate:EVM:WINDow2:GVIew? 2-286
:CALCulate:EVM:WINDow3:MODE EACH|AVERage 2-287
:CALCulate:EVM:WINDow3:MODE? 2-287
:CALCulate:EVM:WINDow3:GVIew RMS|RPEak 2-288
:CALCulate:EVM:WINDow3:GVIew? 2-288
:CALCulate:EVM:WINDow4:MODE EACH|AVERage 2-289
:CALCulate:EVM:WINDow4:MODE? 2-289
:CALCulate:EVM:WINDow4:GVIew RMS|RPEak 2-290
:CALCulate:EVM:WINDow4:GVIew? 2-290
:CALCulate:EVM:WINDow9:GVIew RMS|RPEak 2-291
:CALCulate:EVM:WINDow9:GVIew? 2-291
:CALCulate:EVM:WINDow10:MODE EACH|AVERage 2-292
:CALCulate:EVM:WINDow10:MODE? 2-292
:CALCulate:EVM:WINDow10:GVIew RMS|RPEak 2-293
:CALCulate:EVM:WINDow10:GVIew? 2-293
:CALCulate:EVM:WINDow11:GVIew AVERage|APEak 2-294
:CALCulate:EVM:WINDow11:GVIew? 2-294
:CALCulate:EVM:WINDow11:MODE EACH|AVERage 2-295
:CALCulate:EVM:WINDow11:MODE? 2-295
:CALCulate:EVM:WINDow11:GTYPe RB|SUBCarrier|BOTH 2-296
:CALCulate:EVM:WINDow11:GTYPe? 2-296
2.7.11 Constellation Symbol Number 2-297
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer> 2-297
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer? 2-297
2.7.12 Bottom Graph Symbol Number 2-298
:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer <integer> 2-298
:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer? 2-298
2.7.13 EVM vs Symbol Subcarrier Number 2-299
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer> 2-299
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer? 2-300
2.7.14 Bottom Graph Slot Number 2-301
:CALCulate:EVM:WINDow4|11:SLOT:NUMBer <integer> 2-301
:CALCulate:EVM:WINDow4|11:SLOT:NUMBer? 2-301
2.7.15 Subframe Number 2-302
:CALCulate:EVM:WINDow8:SUBFrame:NUMBer <integer> 2-302
:CALCulate:EVM:WINDow8:SUBFrame:NUMBer? 2-302
2.7.16 Display Page 2-303
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer> 2-303
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer? 2-304
2.7.17 Marker - On/Off 2-305
:CALCulate:EVM:MARKer[:STATe] OFF|ON|0|1 2-305
:CALCulate:EVM:MARKer[:STATe]? 2-305
2.7.18 Active Trace 2-306
:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom 2-306
:CALCulate:EVM:MARKer:ACTive? 2-306
2.7.19 Marker Position Number 2-307
:CALCulate:EVM:MARKer:SUBCarrier <integer> 2-307
:CALCulate:EVM:MARKer:SUBCarrier? 2-308
:CALCulate:EVM:MARKer:SYMBol <integer> 2-310
:CALCulate:EVM:MARKer:SYMBol? 2-310
:CALCulate:EVM:MARKer:RB <integer> 2-311
:CALCulate:EVM:MARKer:RB? 2-312
:CALCulate:EVM:MARKer:DEModsymbol <integer> 2-313
:CALCulate:EVM:MARKer:DEModsymbol? 2-314

2.7.20 Marker Value 2-315
:CALCulate:EVM:MARKer:X? 2-315
:CALCulate:EVM:MARKer:Y[:RMS]? 2-316
:CALCulate:EVM:MARKer:Y:PEAK? 2-317
:CALCulate:EVM:MARKer:EVM[:RMS]? 2-318
:CALCulate:EVM:MARKer:EVM:PEAK? 2-319
:CALCulate:EVM:RB:MARKer:Y? 2-320
:CALCulate:EVM:RB:MARKer:Y:PEAK? 2-321
:CALCulate:EVM:MARKer:Y:MAXimum? 2-322
:CALCulate:EVM:MARKer:Y:MINimum? 2-323
:CALCulate:EVM:RB:MARKer:Y:MAXimum? 2-324
:CALCulate:EVM:RB:MARKer:Y:MINimum? 2-325
2.7.21 Peak Search 2-326
:CALCulate:MARKer:MAXimum 2-326
:CALCulate:MARKer:MAXimum:NEXT 2-327
:CALCulate:MARKer:MINimum 2-328
:CALCulate:MARKer:MINimum:NEXT 2-329
2.7.22 Constellation Sequence Number 2-330
:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer <integer> 2-330
:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer? 2-330
2.7.23 Bottom Graph Sequence Number 2-331
:CALCulate:EVM:WINDow2:PSEQuence:NUMBer <integer> 2-331
:CALCulate:EVM:WINDow2: PSEQuence:NUMBer? 2-331
2.8 Power vs Time Measurement Function 2-332
2.8.1 Power vs Time 2-337
:CONFigure:PVTime 2-337
:INITiate:PVTime 2-337
:FETCh:PVTime[n]? 2-338
:READ:PVTime[n]? 2-339
:MEASure:PVTime[n]? 2-340
2.8.2 Storage Mode 2-341
[:SENSe]:PVTime:AVERage[:STATe] OFF|ON|0|1 2-341
[:SENSe]:PVTime:AVERage[:STATe]? 2-341
2.8.3 Storage Count 2-342
[:SENSe]:PVTime:AVERage:COUNt <integer> 2-342
[:SENSe]:PVTime:AVERage:COUNt? 2-343
2.8.4 Trace Mode 2-344
:DISPlay:PVTime[:VIEW]:SELect BURSt|TRANsient|NOGRaph 2-344
:DISPlay:PVTime[:VIEW]:SELect? 2-344
2.8.5 Reference Level Upper - Burst / Transient 2-345
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer <integer> 2-345
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer? 2-346
2.8.6 Reference Level Lower - Burst / Transient 2-347
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer <integer> 2-347
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer? 2-348
2.8.7 Burst / Transient - Subframe Number 2-349
:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer <integer> 2-349
:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer? 2-349
2.8.8 Marker - On/Off 2-350
:CALCulate:PVTime:MARKer[:STATe] OFF|ON|0|1 2-350
:CALCulate:PVTime:MARKer[:STATe]? 2-350
2.8.9 Marker - Ts Number 2-351
:CALCulate:PVTime:MARKer:TS <integer> 2-351

:CALCulate:PVTime:MARKer:TS? 2-352
2.8.10 Peak Search 2-353
:CALCulate:MARKer:MAXimum 2-353
:CALCulate:MARKer:MAXimum:NEXT 2-354
:CALCulate:MARKer:MINimum 2-355
:CALCulate:MARKer:MINimum:NEXT 2-356
2.9 Measurement Result Saving Function 2-357
:MMEMory:STORe:RESult [<filename>[,<device>]] 2-358
:MMEMory:STORe:RESult:MODE XML|CSV 2-359
:MMEMory:STORe:RESult:MODE? 2-359
2.10 Replay Function 2-360
:MMEMory:LOAD:IQData:STOP 2-361
:MMEMory:LOAD:IQData <filename>,<device>,<application> 2-361
:MMEMory:LOAD:IQData:INFormation? 2-362
:MMEMory:LOAD:IQData:INFormation:STATe? 2-363
:MMEMory:LOAD:IQData:INFormation:FILE? 2-363
:MMEMory:LOAD:IQData:INFormation:DEVice? 2-364
:MMEMory:LOAD:IQData:INFormation:APPLication? 2-364
:MMEMory:LOAD:IQData:INFormation:CONDition? 2-365
:MMEMory:LOAD:IQData:INFormation:ERRor? 2-365
:MMEMory:LOAD:IQData:INFormation:CORRection? 2-366
:MMEMory:LOAD:IQData:INFormation:ROSCillator? 2-367

2.1 Selecting application

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

Table 2.1-1 Device Messages for Selecting Application

Function	Device Messages
Load Application	`:SYSTem:APPLication:LOAD 3GLTE_UL`
Unload Application	`:SYSTem:APPLication:UNLoad 3GLTE_UL`
Application Switch	`:INSTrument[:SELect] 3GLTE_UL|CONFIG`
	`:INSTrument[:SELect]?`
Application Status	`:INSTrument:SYSTem 3GLTE_UL,[ACTive]|INACtive|MINimum`
	`:INSTrument:SYSTem? 3GLTE_UL`
Initialization	`:INSTrument:DEFault`
	`:SYSTem:PRESet`

2.1.1 Loading application

:SYSTem:APPLication:LOAD 3GLTE_UL

Load Application

Function

This command loads this application.

Command

```
:SYSTem:APPLication:LOAD 3GLTE_UL
```

Details

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

Example of Use

To load this application.

```
SYST:APPL:LOAD 3GLTE_UL
```

:SYSTem:APPLication:UNLoad 3GLTE_UL

Unload Application

Function

This command exits this application.

Command

```
:SYSTem:APPLication:UNLoad 3GLTE_UL
```

Details

This function exits an activated application and deletes it from the Application Switch menu.

Example of Use

To exit this application.

```
SYST:APPL:UNL 3GLTE_UL
```

2.1.2 Selecting Application

:INSTrument[:SELect] 3GLTE_UL|CONFIG

Application Switch

Function

This command selects the controlled application.

Command

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

Parameter

<apl_name>	Application
3GLTE_UL	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
:CONFigure[:SWEPt]:SEMask
```

Example of Use

To switch the control target to this application.

```
INST 3GLTE_UL
```

:INSTrument[:SELect]?

Application Switch Query

Function

This command queries the controlled application.

Query

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

Response

```
<apl_name>
```

Parameter

`<apl_name>`	Application
`3GLTE_UL`	This application
`SIGANA`	Signal Analyzer
`SPECT`	Spectrum Analyzer
`CONFIG`	Config

Details

3GLTE_UL is returned when a measurement function of this application is selected.

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

Example of Use

To query the controlled application.

```
INST?
> 3GLTE_UL
```

:INSTrument:SYSTem 3GLTE_UL [ACTive]|INACtive|MINimum

Application Switch and Window Status

Function

This command selects the window status of this application.

Command

```
:INSTrument:SYSTem 3GLTE_UL,<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 the active state.

```
INST:SYST 3GLTE_UL,ACT
```

:INSTrument:SYSTem? 3GLTE_UL

Application Switch And Window Status Query

Function

This command queries the window status of this application.

Query

```
:INSTrument:SYSTem? 3GLTE_UL
```

Response

```
<status>,<window>
```

Parameter

<status>	Status of this application
CURR	Executed and targeted for control
RUN	Executed but not targeted for control
IDLE	Loaded but not executed
UNL	Not loaded
<window>	Window status
ACTive	Active
INACtive	Inactive
MINimum	Minimized
NON	Window not displayed

Example of Use

To query the window status of this application.

```
INST:SYST? 3GLTE_UL
> 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.
Refer to `:INSTrument:DEFault.`

Command

```
:SYSTem:PRESet
```

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 parameters applied in common to this application, such as frequency and level.

Table 2.2-1 Device Messages for Setting Basic Parameters

Parameter	Device Messages
Carrier Frequency	[:SENSe]:FREQuency:CENTer <freq>
	[:SENSe]:FREQuency:CENTer?
Frequency Span	[:SENSe]:FREQuency:SPAN AUTO|<freq>
	[:SENSe]:FREQuency:SPAN?
Operating Band Setting	:CALCulation:OBANd:FREQuency:SETTing STANdard|USER
	:CALCulation:OBANd:FREQuency:SETTing?
Operating Band Number	:CALCulation:OBANd <integer>
	:CALCulation:OBANd?
Operating Band Lowest Frequency	:CALCulation:OBANd:FREQuency:LOWest <freq>
	:CALCulation:OBANd:FREQuency:LOWest?
Operating Band Highest Frequency	:CALCulation:OBANd:FREQuency:HIGHest <freq>
	:CALCulation:OBANd:FREQuency:HIGHest?
Input Level	[:SENSe]:POWer[:RF]:RANGe:ILEVel <real>
	[:SENSe]:POWer[:RF]:RANGe:ILEVel?
Reference Level (Remote only)	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <real>
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?
Level Offset	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet <rel_power>
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet?
Level Offset State	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe OFF|ON|0|1
	:DISPlay:WINDow[1]:TRACe:Y[:SCALe]:RLEVel:OFFSet:STATe?
Pre-Amp State	[:SENSe]:POWer[:RF]:GAIN[:STATe] OFF|ON|0|1
	[:SENSe]:POWer[:RF]:GAIN[:STATe]?
Lowest ATT Setting	[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing 0dB|4dB
	[:SENSe]:POWer[:RF]:ATTenuation:LOWest:SETTing?

2.2.1 Carrier Frequency

[:SENSe]:FREQuency:CENTer <freq>

Carrier Frequency

Function

This command sets the carrier frequency of the measured signal.

Command

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

Parameter

`<freq>`		Carrier frequency
	Range	300 MHz to the upper limit of the main unit (When MS2830A-004/104/077/177/078/178 is installed, or MS2850A) 100 MHz to the upper limit of the main unit (MS269xA, MS2830A other than above)
	Resolution	1 Hz
	Suffix code	`HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ` Hz is used when omitted.
	Default	1920 MHz

Details

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

Example of Use

To set the carrier frequency to 1.920 GHz.

```
FREQ:CENT 1.920GHZ
```

[: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	300 MHz to the upper limit of the main unit (When MS2830A-004/104/077/177/078/178 is installed, or MS2850A) 100 MHz to the upper limit of the main unit (MS269xA, MS2830A other than above)
	Resolution	1 Hz Value is returned in Hz units.

Example of Use

To query the carrier frequency.

```
FREQ:CENT?
> 1920000000
```

2.2.2 Frequency Span

[:SENSe]:FREQuency:SPAN AUTO|<freq>

Frequency Span

Function

This command sets the Frequency Span.

Command

```
[:SENSe]:FREQuency:SPAN AUTO|<freq>
```

Parameter

AUTO|<freq>	Frequency Span
AUTO	Auto (Default)
31.25MHZ	31.25 MHz
62.5MHZ	62.5 MHz (When MS269xA-004/104/077/177/078/178 or MS2830A-004/104/077/177/078/178 is installed, or MS2850A.)
125MHZ	125 MHz (When MS269xA-004/104/078/178 or MS2830A-004/104/078/178 is installed, or MS2850A.)
Suffix code	HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ Hz is used when omitted.

Details

This can be set when MX269021A-001 is installed and Standard is LTE-A.
This is fixed to 31.25 MHz and cannot be set when Standard is LTE.
This is fixed to the span of digitized data when Replay function is executed.
The maximum span is defined as below.

31.25 MHz	When neither MS269xA-004/104/077/177/078/178 nor MS2830A-004/104/077/177/078/178 is installed.
62.5 MHz	When neither MS269xA-004/104/078/178 nor MS2830A-004/104//078/178 is installed and when MS269xA-077/177 or MS2830A-077/177 is installed.
125 MHz	When MS269xA-004/104/078/178, MS2830A-004/104/078/178 is installed, or MS2850A.

Example of Use

To set Frequency Span to 31.25 MHz.

```
FREQ:SPAN 31.25MHZ
```

[:SENSe]:FREQuency:SPAN?

Frequency Span Query

Function

This command queries the Frequency Span.

Query

```
[:SENSe]:FREQuency:SPAN?
```

Response

```
<freq>
```

Parameter

<freq>	Frequency Span
31250000	31.25 MHz
62500000	62.5 MHz
125000000	125 MHz

Example of Use

To query the Frequency Span.

```
FREQ:SPAN?
> 31250000
```

2.2.3 Operating Band Setting

:CALCulation:OBANd:FREQuency:SETTing STANdard|USER

Operating Band Setting

Function

This command sets the Setting Mode of Operating Band (Standard or User).

Command

```
:CALCulation:OBANd:FREQuency:SETTing <mode>
```

Parameter

<mode>	Setting Mode of Operating Band
STANdard	Standard (Default)
USER	User

Details

When the mode is Standard, Operating Band is set by the band number. When the mode is User, Operating Band is set with the highest and lowest frequencies set by the user.

Example of Use

To set Operating Band to Standard.

```
CALC:OBAN:FREQ:SETT STAN
```

:CALCulation:OBANd:FREQuency:SETTing?

Operating Band Setting Query

Function

This command queries the Setting Mode of Operating Band (Standard or User).

Query

```
:CALCulation:OBANd:FREQuency:SETTing?
```

Response

```
<mode>
```

Parameter

<mode>	Setting Mode of Operating Band
STAN	Standard (Default)
USER	User

Example of Use

To query the Operating Band Setting.

```
CALC:OBAN:FREQ:SETT?
> STAN
```

2.2.4 Operating Band Number

:CALCulation:OBANd <integer>

Operating Band Number

Function

This command sets the Operating Band Number.

Command

```
:CALCulation:OBANd <integer>
```

Parameter

<integer>		Operating Band Number
	Range	0 to 28, 30, 31, 65, 66, 68, 70
	Resolution	1
	Default	0

Details

This can be set only when Operating Band Setting is Standard.
The Operating Band setting is used for calculating the Spectral Flatness measurement Inside and Outside measurement results in Summary.
When the setting is 0, it is handled as all inside the Tx band.
Inside and Outside correspond respectively to Range 1 and Range 2 defined in 3GPP TS 36.521-1.

Example of Use

To set Operating Band Number to 7.

```
:CALC:OBAN 7
```

:CALCulation:OBANd?

Operating Band Number Query

Function

This command queries the Operating Band Number.

Query

```
:CALCulation:OBANd?
```

Response

```
<integer>
```

Parameter

<integer>		Operating Band Number
	Range	0 to 28, 30, 31, 65, 66, 68, 70
	Resolution	1

Example of Use

To query the Operating Band Number.

```
:CALC:OBAN?
> 7
```

2.2.5 Operating Band Lowest Frequency

:CALCulation:OBANd:FREQuency:LOWest <freq>

Operating Band Lowest Frequency

Function

This command sets the Operating Band Lowest Frequency.

Command

```
:CALCulation:OBANd:FREQuency:LOWest <freq>
```

Parameter

`<freq>`		Operating Band Lowest Frequency
	Range	(Minimum Carrier Frequency–Maximum Span / 2) to (Maximum Carrier Frequency+Maximum Span / 2)
	Resolution	1 Hz
	Suffix code	`HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ` Hz when omitted.
	Default	(Minimum Carrier Frequency–Maximum Span / 2)

Details

This can be set only when Operating Band Setting is User.
Make sure not to set a value above Operating Band Highest Frequency.

Example of Use

To set the Operating Band Lowest Frequency to 84.375 MHz.

```
CALC:OBAN:FREQ:LOW 84.375MHZ
```

:CALCulation:OBANd:FREQuency:LOWest?

Operating Band Lowest Frequency Query

Function

This command queries the Operating Band Lowest Frequency.

Query

```
:CALCulation:OBANd:FREQuency:LOWest?
```

Response

```
<freq>
```

Parameter

`<freq>`		Operating Band Lowest Frequency
	Range	(Minimum Carrier Frequency–Maximum Span / 2) to (Maximum Carrier Frequency+Maximum Span / 2)
	Resolution	1 Hz Value is returned in Hz units.

Example of Use

To query the Operating Band Lowest Frequency.

```
CALC:OBAN:FREQ:LOW?
> 84375000
```

2.2.6 Operating Band Highest Frequency

:CALCulation:OBANd:FREQuency:HIGHest <freq>

Operating Band Highest Frequency

Function

This command sets the Operating Band Highest Frequency.

Command

```
:CALCulation:OBANd:FREQuency:LOWest <freq>
```

Parameter

`<freq>`		Operating Band Highest Frequency
	Range	(Minimum Carrier Frequency–Maximum Span / 2) to (Maximum Carrier Frequency+Maximum Span / 2)
	Resolution	1 Hz
	Suffix code	`HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ` Hz is used when omitted.
	Default	(Maximum Carrier Frequency+Maximum Span / 2)

Details

This can be set only when Operating Band Setting is User.
Make sure not to set a value below Operating Band Lowest Frequency.

Example of Use

To set Operating Band Highest Frequency to 6.015625 GHz.

```
CALC:OBAN:FREQ:HIGH 6.015625GHZ
```

:CALCulation:OBANd:FREQuency:HIGHest?

Operating Band Highest Frequency Query

Function

This command queries the Operating Band Highest Frequency.

Query

```
:CALCulation:OBANd:FREQuency:HIGHest?
```

Response

```
<freq>
```

Parameter

`<freq>`		Operating Band Highest Frequency
	Range	(Minimum Carrier Frequency–Maximum Span / 2) to (Maximum Carrier Frequency+Maximum Span / 2)
	Resolution	1 Hz Value is returned in Hz units.

Example of Use

To query the Operating Band Highest Frequency.

```
CALC:OBAN:FREQ:HIGH?
> 6015625000
```

2.2.7 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 When Pre-Amp is Off: (–80.00 + level offset) to (10.00 + level offset) dBm When Pre-Amp is 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-008 6 GHz Preamplifier, MS2830A-008 Preamplifier, or MS2850A-068 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 –10 dBm.

```
POW:RANG:ILEV -10
```

[: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 When Pre-Amp is Off: (–80.00 + level offset) to (10.00 + level offset) dBm When Pre-Amp is On:
Resolution	0.01 dB Value is returned in dBm units.

Example of Use

To query the input level.

```
POW:RANG:ILEV?
> -10.00
```

2.2.8 Reference Level

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

Reference Level (Remote only)

Function

This command sets the reference level for ACP/Channel Power /OBW/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

Reference Level indicates the peak level of the input signal by using the internal parameter which is automatically calculated to Input Level and is not shown on the screen. This Reference level value is applied to the measurement function when fetching ACP/Channel Power/OBW/SEM measurement functions. The Input Level value 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 (Remote only)

Function

This command queries the reference level for ACP/Channel Power /OBW/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
```

2.2.9 Level Offset

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

Level Offset Value

Function

This command sets the input level offset value.

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 input level offset value 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 input level offset value.

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 input level offset value.

```
DISP:WIND:TRAC:Y:RLEV:OFFS?
> 10.00
```

2.2.10 Level Offset State

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

Level Offset State

Function

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

Command

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

Parameter

<switch>	Enable/disable input level offset function
OFF|0	Disabled (default).
ON|1	Enabled

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 the state of the input level offset function.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Enable/disable input level offset function
0	Disabled
1	Enabled

Example of Use

To query the state of the input level offset function.

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

2.2.11 Pre Amp State

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

Pre Amp State

Function

This command sets Pre-Amp to On/Off.

Command

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

Parameter

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

Details

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

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

Example of Use

To set Pre-Amp to On.

```
POW:GAIN ON
```

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

Pre Amp State Query

Function

This command queries the state of Pre-Amp.

Query

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

Response

```
<switch>
```

Parameter

`<switch>`	Pre-Amp On/Off
`0`	Off
`1`	On

Details

Off is returned when the Option 008 is not installed.

Example of Use

To query the state of Pre-Amp.

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

2.2.12 Lowest ATT Setting

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

Lowest ATT Setting

Function

This command switches the lower limit of the internal attenuator among 0, 4 and 10 dB.

Command

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

Parameter

`< mode>`	Lowest ATT setting
`0DB`	0 dB
`4DB`	4 dB (Default)
`10DB`	10 dB

Details

This command switches the lower limit setting of the attenuator between 4, 10 and 0 dB. When MS2830A-045 is installed and 4 dB is selected, the lowest ATT value becomes 10 dB.

Example of Use

To set the lowest ATT setting to 0 dB.

```
POW:ATT:LOW:SETT 0DB
```

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

Lowest ATT Setting Query

Function

This command queries the lower limit of the internal attenuator.

Query

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

Response

```
<mode>
```

Parameter

`<mode>`	Lowest ATT setting
`0DB`	0 dB
`4DB`	4 dB
`10DB`	10 dB

Details

When MS2830A-045 is installed and 4 dB is selected, the lowest ATT value becomes 10 dB.

Example of Use

To query the lowest ATT setting.

```
POW:ATT:LOW:SETT?
> 0DB
```

2.3 Setting System Parameters

Table 2.3-1 lists the device messages for the communication system of the measurement target.

Table 2.3-1 Device Messages for Setting System Parameters

Parameter	Device Messages
Standard	[:SENSe]:RADio:STANdard LTE|LTEA
	[:SENSe]:RADio:STANdard?
Contiguous Mode	[:SENSe]:RADio:CONTiguous OFF|ON|0|1
	[:SENSe]:RADio:CONTiguous?
Number of CCs	[:SENSe]:RADio:CC:NUMBer <integer>
	[:SENSe]:RADio:CC:NUMBer?
Synchronization CC#	[:SENSe]:RADio:SYNChronization:CC 0|1|EACH
	[:SENSe]:RADio:SYNChronization:CC?
Setting/Result Target CC#	[:SENSe]:RADio:TCC 0|1
	[:SENSe]:RADio:TCC?
In-Band Emission Carrier Leakage Frequency	[:SENSe]:RADio:CLFRequency:IBEMission CFRequency|CCCenter
	[:SENSe]:RADio:CLFRequency:IBEMission?
Carrier Leak Rejection	[:SENSe]:RADio:CLEak:REJection:CFRequency OFF|ON|0|1
	[:SENSe]:RADio:CLEak:REJection:CFRequency?
	[:SENSe]:RADio:CLEak:REJection:CCCenter OFF|ON|0|1
	[:SENSe]:RADio:CLEak:REJection:CCCenter?
CC Status	[:SENSe]:RADio:CC[:STATe] OFF|ON|0|1
	[:SENSe]:RADio:CC[:STATe]?
CC Frequency Offset	[:SENSe]:RADio:CC:FREQunecy:OFFSet <freq_0>,<freq_1>
	[:SENSe]:RADio:CC:FREQunecy:OFFSet?
Channel Bandwidth	[:SENSe]:RADio:CBANdwidth 20|15|10|5|3|1M4
	[:SENSe]:RADio:CBANdwidth?
Target Channel	[:SENSe]:RADio:TCHannel:PUSCh INCLude|EXCLude
	[:SENSe]:RADio:TCHannel:PUSCh?
	[:SENSe]:RADio:TCHannel:PUCCh INCLude|EXCLude
	[:SENSe]:RADio:TCHannel:PUCCh?
	[:SENSe]:RADio:TCHannel:PRACh INCLude|EXCLude
	[:SENSe]:RADio:TCHannel:PRACh?
	[:SENSe]:RADio:TCHannel:SRSignal INCLude|EXCLude
	[:SENSe]:RADio:TCHannel:SRSignal?
Reference Signal	:CALCulate:EVM:RSIGnal:ZCSequence:LENGth <integer>
	:CALCulate:EVM:RSIGnal:ZCSequence:LENGth?
	:CALCulate:EVM:RSIGnal:SGRoup:NUMBer <integer>
	:CALCulate:EVM:RSIGnal:SGRoup:NUMBer?
	:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer <integer>
	:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer?

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

Parameter	Device Messages
Reference Signal (Cont'd)	:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
Reference Signal PUSCH	:CALCulate:EVM:PUSCh:RSIGnal:AUTO OFF|ON|0|1
	:CALCulate:EVM:PUSCh:RSIGnal:AUTO?
	:CALCulate:EVM:PUSCh:RSIGnal:CELLid <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:CELLid?
	:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2?
	:CALCulate:EVM:PUSCh:RSIGnal:DSS <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:DSS?
	:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing OFF|ON|0|1
	:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing?
	:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1
	:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing?
	:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth?
	:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame 0|1|2|3|4|5|6|7|8|9 OFF|ON|0|1
	[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame 0|1|2|3|4|5|6|7|8|9?
	[:SENSe]:RADio:PUSCh:ASSignment OFF|ON|0|1
	[:SENSe]:RADio:PUSCh:ASSignment?

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

Parameter	Device Messages
Reference Signal PUCCH	:CALCulate:EVM:PUCCh:RSIGnal:AUTO OFF|ON|0|1
	:CALCulate:EVM:PUCCh:RSIGnal:AUTO?
	:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth?
	:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer>?
	:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13?
	:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
	:CALCulate:EVM:PUCCh:RSIGnal:CELLid <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:CELLid?
	:CALCulate:EVM:PUCCh:RSIGnal:NCS1 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:NCS1?
	:CALCulate:EVM:PUCCh:RSIGnal:NRB2 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:NRB2?

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

Parameter	Device Messages
Reference Signal PUCCH (Cont'd)	:CALCulate:EVM:PUCCh:RSIGnal:NRUCch1|2 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:NRUCch1|2?
	:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PUCCh:RSIGnal:DSHift <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:DSHift?
	:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt <integer>
	:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt?
	[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1
	[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	[:SENSe]:RADio:PUCCh:ASSignment OFF|ON|0|1
	[:SENSe]:RADio:PUCCh:ASSignment?
	:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1
	:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing?
PRACH	:CALCulate:EVM:PRACh:CONFiguration <integer>
	:CALCulate:EVM:PRACh:CONFiguration?
	:CALCulate:EVM:PRACh:PRSequence:NUMBer <integer>
	:CALCulate:EVM:PRACh:PRSequence:NUMBer?
	:CALCulate:EVM:PRACh:CSHift <integer>
	:CALCulate:EVM:PRACh:CSHift?
Sounding Reference Signal	:CALCulate:EVM:SRSignal:AUTO OFF|ON|0|1
	:CALCulate:EVM:SRSignal:AUTO?
	:CALCulate:EVM:SRSignal:ZCSequence:LENGth <integer>
	:CALCulate:EVM:SRSignal:ZCSequence:LENGth?
	:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

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

Parameter	Device Messages
Sounding Reference Signal	:CALCulate:EVM:SRSignal:CSHift <integer>
	:CALCulate:EVM:SRSignal:CSHift?
	:CALCulate:EVM:SRSignal:TCOMb <integer>
	:CALCulate:EVM:SRSignal:TCOMb?
	:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration <integer>
	:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration?
	:CALCulate:EVM:SRSignal:BANDwidth <integer>
	:CALCulate:EVM:SRSignal:BANDwidth?
	:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration <integer>
	:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration?
	:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1
	:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:SRSignal:DSS <integer>
	:CALCulate:EVM:SRSignal:DSS?
	:CALCulate:EVM:SRSignal:CELLid <integer>
	:CALCulate:EVM:SRSignal:CELLid?
	:CALCulate:EVM:SRSignal:SGRoup:HOPPing OFF|ON|0|1
	:CALCulate:EVM:SRSignal:SGRoup:HOPPing?
	:CALCulate:EVM:SRSignal:BSEQuence:HOPPing OFF|ON|0|1
	:CALCulate:EVM:SRSignal:BSEQuence:HOPPing?
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?
Modulation Scheme	:CALCulate:EVM:PUSCh:MODulation QPSK|16Qam|64Qam|AUTO
	:CALCulate:EVM:PUSCh:MODulation?
PUCCH Format	:CALCulate:EVM:PUCCh:FORMat 1|1a|1b|2|2a|2b
	:CALCulate:EVM:PUCCh:FORMat?
Analysis Offset Time	[:SENSe]:EVM:CAPTure:TIME:OFFSet <time>
	[:SENSe]:EVM:CAPTure:TIME:OFFSet?
EVM Window Length	:CALCulate:EVM:WLENgth <integer>
	:CALCulate:EVM:WLENgth?
	:CALCulate:EVM:WLENgth:W <integer>
	:CALCulate:EVM:WLENgth:W?
	:CALCulate:EVM:WLENgth:TYPE TS|W
	:CALCulate:EVM:WLENgth:TYPE?
Channel Estimation	:CALCulate:EVM:CHANnel:ESTimation OFF|ON|0|1
	:CALCulate:EVM:CHANnel:ESTimation?

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

Parameter	Device Messages
Equalization Mode	:CALCulate:EVM:EQUalization 200906|200909|DMRS
	:CALCulate:EVM:FEQualization:TABLe?
Exclusion Period	:CALCulate:EVM:EPERiod OFF|ON|0|1
	:CALCulate:EVM:EPERiod?
Leading Exclusion Period	:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time>
	:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
Lagging Exclusion Period	:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time>
	:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
Channel Bandwidth Selective Filter	[:SENSe]:RADio:CBANdwidth:FILTer OFF|ON|0|1
	[:SENSe]:RADio:CBANdwidth:FILTer?
RB Type of In-Band Emission Query	:CALCulate:EVM:WINDow11:RBLock:TYPE?
Delta RB of In-Band Emission Query	:CALCulate:EVM:WINDow11:RBLock:DELTa?
RB Setting	:CALCulate:EVM:RBLock:FIRSt <integer>
	:CALCulate:EVM:RBLock:FIRSt?
	:CALCulate:EVM:RBLock:NUMBer <integer>
	:CALCulate:EVM:RBLock:NUMBer?
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt?
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer?
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
	:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
	:CALCulate:EVM:PRACh:FREQuency:OFFSet <integer>
	:CALCulate:EVM:PRACh:FREQuency:OFFSet?
	:CALCulate:EVM:SRSignal:RBLock:NUMBer <integer>
	:CALCulate:EVM:SRSignal:RBLock:NUMBer?
	:CALCulate:EVM:SRSignal:RBLock:FIRSt <integer>
	:CALCulate:EVM:SRSignal:RBLock:FIRSt?

2.3.1 Standard

[:SENSe]:RADio:STANdard LTE|LTEA

Standard

Function

This command sets the Standard (LTE / LTE-Advanced).

Command

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

Parameter

<mode>	Standard	
LTE	LTE	(Default)
LTEA	LTE-A:	LTE-Advanced

Details

The software option MX269021A-001 is required to select LTE-A.

Example of Use

To set Standard to LTE.

```
RAD:STAN LTE
```

[:SENSe]:RADio:STANdard?

Standard Query

Function

This command queries the Standard.

Query

```
[:SENSe]:RADio:STANdard?
```

Response

```
<mode>
```

Parameter

<mode>	Standard	
LTE	LTE	
LTEA	LTE-A:	LTE-Advanced

Example of Use

To query the Standard.

```
RAD:STAN?
> LTE
```

2.3.2 Contiguous Mode

[:SENSe]:RADio:CONTiguous OFF|ON|0|1

Contiguous Mode

Function

This command sets the Contiguous Mode.

Command

```
[:SENSe]:RADio:CONTiguous <switch>
```

Parameter

<switch>	Contiguous Mode
OFF|0	Intra-band non-contiguous CA
ON|1	Intra-band contiguous CA (Default)

Details

This can be set when MX269021A-001 is installed and Standard is LTE-A.

Example of Use

To set the Contiguous Mode to On.

```
RAD:CONT ON
```

[:SENSe]:RADio:CONTiguous?

Contiguous Mode Query

Function

This command queries the Contiguous Mode.

Query

```
[:SENSe]:RADio:CONTiguous?
```

Response

```
<switch>
```

Parameter

<switch>	Contiguous Mode
0	Intra-band non-contiguous CA
1	Intra-band contiguous CA

Example of Use

To query the Contiguous Mode.

```
RAD:CONT?
> 1
```

2.3.3 Number of CCs

[:SENSe]:RADio:CC:NUMBer <integer>

Number of CCs

Function

This command sets the number of target CCs to measure.

Command

```
[:SENSe]:RADio:CC:NUMBer <integer>
```

Parameter

<integer>	Number of CCs to measure
Range	1 to 2
Resolution	1
Suffix code	None
Default	2

Details

This can be set when MX269021A-001 is installed and Standard is LTE-A.

Example of Use

To set the number of target CCs to 1.

```
RAD:CC:NUMB 1
```

[:SENSe]:RADio:CC:NUMBer?

Number of CCs Query

Function

This command queries the number of target CCs to measure.

Query

```
[:SENSe]:RADio:CC:NUMBer?
```

Response

```
<integer>
```

Parameter

<integer>	Number of CCs to measure
Range	1 to 2
Resolution	1

Example of Use

To query the number of target CCs to measure.

```
RAD:CC:NUMB?
> 1
```

2.3.4 Synchronization CC#

[:SENSe]:RADio:SYNChronization:CC 0|1|EACH

Synchronization CC#

Function

This command sets CC# to use in frame synchronization.

Command

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

Parameter

<mode>	Synchronization CC#	
0	CC#0	(Default)
1	CC#1	(When Number of CCs is 2.)
EACH	Each CC	(When Contiguous Mode is Off.)

Details

This is available when MX269021A-001 is installed, and Standard is LTE-A.
When set to Each CC, CC#0 and CC#1 are synchronized individually and analyzed in different frame timings.

Example of Use

To set CC# to use in frame synchronization to 0.

```
RAD:SYNC:CC 0
```

[:SENSe]:RADio:SYNChronization:CC?

Synchronization CC# Query

Function

This command queries CC# to use in frame synchronization.

Query

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

Response

```
<mode>
```

Parameter

<mode>	Synchronization CC#
0	CC#0
1	CC#1
EACH	EACH CC

Example of Use

To query CC# to use in frame synchronization.

```
RAD:SYNC:CC?
> 0
```

2.3.5 Setting/Result Target CC#

[:SENSe]:RADio:TCC 0|1

Setting/Result Target CC#

Function

This command selects target CC# for parameter setting and measurement result display (both screen and remote) regarding the items to measure by CC individually.

Command

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

Parameter

<mode>	Setting/Result Target CC#	
0	CC#0	(Default)
1	CC#1	(When Number of CCs is 2.)

Details

This is available when MX269021A-001 is installed, and Standard is LTE-A.

Example of Use

To set a target for parameter setting and measurement result display to CC#0.

```
RAD:TCC 0
```

[:SENSe]:RADio:TCC?

Setting/Result Target CC# Query

Function

This command queries the target CC# for parameter setting and measurement result display (both screen and remote) regarding the items to measure by CC individually.

Query

```
[:SENSe]:RADio:TCC?
```

Response

```
<mode>
```

Parameter

<mode>	Setting/Result Target CC#
0	CC#0
1	CC#1

Example of Use

To query the target CC# for parameter setting and measurement result display.

```
RAD:TCC?
> 0
```

2.3.6 In-Band Emission Carrier Leakage Frequency

[:SENSe]:RADio:CLFRequency:IBEMission CFRequency|CCCenter

n-Band Emission Carrier Leakage Frequency

Function

This command sets Position of Carrier Leakage Frequency (depends on DUT) in LTE-Advanced In-band emission measurement.

Command

```
[:SENSe]:RADio:CLFRequency:IBEMission <mode>
```

Parameter

<mode>	Position of Carrier Leakage Frequency
CFRequency	At Carrier Frequency (Default)
CCCenter	At Each CC Center

Details

This is available when MX269021A-001 is installed, and Standard is LTE-A.
It is unavailable when CC#0 Status and CC#1 Status are both On.

Example of Use

To set Position of Carrier Leakage Frequency in In-band emission measurement to At Carrier Frequency.

```
RAD:CLFR:IBEM CFR
```

[:SENSe]:RADio:CLFRequency:IBEMission?

In-Band Emission Carrier Leakage Frequency Query

Function

This command queries Position of Carrier Leakage Frequency (depends on DUT) in LTE-Advanced In-band emission measurement.

Query

```
[:SENSe]:RADio:CLFRequency:IBEMission?
```

Response

```
<mode>
```

Parameter

<mode>	Position of Carrier Leakage Frequency
CFR	At Carrier Frequency
CCC	At Each CC Center

Example of Use

To query Position of Carrier Leakage Frequency in In-band emission measurement.

```
RAD:CLFR:IBEM?
> CFR
```

2.3.7 Carrier Leak Rejection

[:SENSe]:RADio:CLEak:REJection:CFRequency OFF|ON|0|1

Carrier Leak Rejection (At Carrier Frequency)

Function

Sets whether to remove carrier leak at the center of CA bandwidth (frequency set for Carrier Frequency) in LTE-Advanced CA measurement.

Command

```
[:SENSe]:RADio:CLEak:REJection:CFRequency <switch>
```

Parameter

`<switch>`	Removes carrier leak at the center of CA bandwidth or not.
`OFF|0`	Does not remove carrier leak. (Default)
`ON|1`	Removes carrier leak.

Details

The setting is available when the MX269021A-001 is installed and Standard is LTE-A.

Note:

The measurement results of Origin Offset are always carrier leak elements at the center of CC#0 and CC#1, regardless of On/Off status of this function.

Example of Use

To set removal of carrier leak at the center of CA bandwidth.

```
RAD:CLE:REJ:CFR ON
```

[:SENSe]:RADio:CLEak:REJection:CFRequency?

Carrier Leak Rejection (At Carrier Frequency) Query

Function

Queries whether carrier leak is removed at the center of CA bandwidth in LTE Advanced CA measurement.

Query

```
[:SENSe]:RADio:CLEak:REJection:CFRequency?
```

Response

```
<switch>
```

Parameter

`<switch>`	Removes carrier leak at the center of CA bandwidth or not.
`0`	Does not remove carrier leak.
`1`	Removes carrier leak.

Example of Use

To query whether carrier leak is removed at the center of CA bandwidth or not.

```
RAD:CLE:REJ:CFR?
> 1
```

[:SENSe]:RADio:CLEak:REJection:CCCenter OFF|ON|0|1

Carrier Leak Rejection (At CC Center)

Function

Sets whether to remove carrier leak at the CC center (frequency set for CC Frequency Offset) in LTE-Advanced CA measurement.

Command

```
[:SENSe]:RADio:CLEak:REJection:CCCenter <switch>
```

Parameter

`<switch>`	Removes carrier leak at the center of CC bandwidth or not.
`OFF|0`	Does not remove carrier leak. (Default)
`ON|1`	Removes carrier leak.

Details

The setting is available when the MX269021A-001 is installed and Standard is LTE-A.
The same setting can be performed for CC#0 and CC#1 individually. To change the CC to set, edit Setting/Result Target CC#.

Note:

The measurement results of Origin Offset are always carrier leak elements at the center of CC#0 and CC#1, regardless of On/Off status of this function.

Example of Use

To set removal of carrier leak at the center of CC bandwidth.

```
RAD:CLE:REJ:CCC ON
```

[:SENSe]:RADio:CLEak:REJection:CCCenter?

Carrier Leak Rejection (At CC Center) Query

Function

Sets whether to remove carrier leak at the center of CC bandwidth in LTE Advanced CA measurement.

Query

```
[:SENSe]:RADio:CLEak:REJection:CCCenter?
```

Response

```
<switch>
```

Parameter

`<switch>`	Removes carrier leak at the center of CC bandwidth or not.
`0`	Does not remove carrier leak.
`1`	Removes carrier leak.

Example of Use

To query whether carrier leak is removed at the center of CC bandwidth or not.

```
RAD:CLE:REJ:CCC?
> 1
```

2.3.8 CC Status

[:SENSe]:RADio:CC[:STATe] OFF|ON|0|1

CC Status

Function

This command sets the CC Status. When the status is On, the measurement is performed with the assumption that a signal is allocated to the CC. When it is Off, the measurement is performed with the assumption that a signal is not allocated to the CC .

Command

```
[:SENSe]:RADio:CC[:STATe] <switch>
```

Parameter

<switch>	CC Status
OFF|0	OFF
ON|1	ON (Default)

Details

This is available when MX269021A-001 is installed, and Standard is LTE-A.
It can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the CC Status to On.

```
RAD:CC ON
```

[:SENSe]:RADio:CC[:STATe]?

CC Status Query

Function

This command queries the setting of CC Status.

Query

```
[:SENSe]:RADio:CC[:STATe]?
```

Response

```
<switch>
```

Parameter

<switch>	CC Status
0	OFF
1	ON

Details

This is set for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the setting of CC Status.

```
RAD:CC?
> 1
```

2.3.9 CC Frequency Offset

[:SENSe]:RADio:CC:FREQunecy:OFFSet <freq_0>,<freq_1>

CC Frequency Offset

Function

This command sets Frequency Offset against Carrier Frequency of each CC collectively.

Command

```
[:SENSe]:RADio:CC:FREQunecy:OFFSet <freq_0>,<freq_1>
```

Parameter

<freq 0>,<freq 1>	CC#0, CC#1 Frequency Offset
Range	±(Valid Span – Channel Bandwidth) / 2
Resolution	1 Hz
Suffix code	HZ,KHZ,KZ,MHZ,MZ,GHZ,GZ Hz is used when omitted.
Default	CC#0 = –2.4 MHz CC#1 = 2.4 MHz

Details

This is available when MX269021A-001 is installed, and Standard is LTE-A.

When Frequency Span is Auto, the above setting range is set according to the maximum span.
When Contiguous Mode is On, the Freq. Offset between CC#0 and CC#1 is limited to the multiples of 300 kHz.
When Frequency Span is Auto, the span is automatically set as below.

31.25 MHz	The case where absolute value of each CC edge is 15.625 MHz or below.
62.5 MHz	The case where absolute value of each CC edge is 31.25 MHz and that does not correspond to the above.
125 MHz	The case that does not correspond to the above.

Note:

When Contiguous Mode is changed to On from Off, CC#1 value is rounded up or down automatically so that it becomes the closest multiple of 300 kHz.

Example of Use

To set frequency offset of CC#0 and CC#1 to –2.4 MHz and 2.4 MHz respectively.

```
RAD:CC:FREQ:OFFS -2400000,2400000
```

[:SENSe]:RADio:CC:FREQunecy:OFFSet?

CC Frequency Offset Query

Function

This command queries frequency offset of each CC against Carrier Frequency.

Query

```
[:SENSe]:RADio:CC:FREQunecy:OFFSet?
```

Response

```
<freq 0>,<freq 1>
```

Parameter

<freq 0>,<freq 1>	CC#0, CC#1 Frequency Offset
Range	±(Valid Span – Channel Bandwidth) / 2
Resolution	1 Hz

Example of Use

To query the frequency offset settings of CC#0 and CC#1.

```
RAD:CC:FREQ:OFFS?
> -2400000,2400000
```

2.3.10 Channel Bandwidth

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

Channel Bandwidth

Function

This command sets the band of the measured signal.

Command

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

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

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 setting of the band.

Query

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

Response

```
<mode>
```

Parameter

<mode>	Bandwidth for signal to be measured
20	Sets 20 MHz band signal for analysis.
15	Sets 15 MHz band signal for analysis.
10	Sets 10 MHz band signal for analysis.
5	Sets 5 MHz band signal for analysis.
3	Sets 3 MHz band signal for analysis.
1M4	Sets 1.4 MHz band signal for analysis.

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the bandwidth of the measured signal.

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

2.3.11 Target Channel

[:SENSe]:RADio:TCHannel:PUSCh INCLude|EXCLude

Target Channel PUSCH

Function

This command sets the status of PUSCH target channel.

Command

```
[:SENSe]:RADio:TCHannel:PUSCh <mode>
```

Parameter

`<mode>`	PUSCH measurement	
`INCLude`	Include:	Measures (Default)
`EXCLude`	Exclude:	Does not measure

Example of Use

To set the status of PUSCH target channel to Include.

```
RAD:TCH:PUSC INCL
```

[:SENSe]:RADio:TCHannel:PUSCh?

Target Channel PUSCH Query

Function

This command queries the status of PUSCH target channel.

Query

```
[:SENSe]:RADio:TCHannel:PUSCh?
```

Response

```
<mode>
```

Parameter

`<mode>`	PUSCH measurement	
`INCL`	Include:	Measures
`EXCL`	Exclude:	Does not measure

Example of Use

To query the status of PUSCH target channel.

```
RAD:TCH:PUSC?
> INCL
```

[:SENSe]:RADio:TCHannel:PUCCh INCLude|EXCLude

Target Channel PUCCH

Function

This command sets the status of PUCCH target channel.

Command

```
[:SENSe]:RADio:TCHannel:PUCCh <mode>
```

Parameter

<mode>	PUCCH measurement	
INCLude	Include:	Measures
EXCLude	Exclude:	Does not measure (Default)

Example of Use

To set the status of PUCCH target channel to Include.

```
RAD:TCH:PUCC INCL
```

[:SENSe]:RADio:TCHannel:PUCCh?

Target Channel PUCCH Query

Function

This command queries the status of PUCCH target channel.

Query

```
[:SENSe]:RADio:TCHannel:PUCCh?
```

Response

```
<mode>
```

Parameter

<mode>	PUCCH measurement	
INCL	Include:	Measures
EXCL	Exclude:	Does not measure

Example of Use

To query the status of PUCCH target channel.

```
RAD:TCH:PUCC?
> INCL
```

[:SENSe]:RADio:TCHannel:PRACh INCLude|EXCLude

Target Channel PRACH

Function

This command sets the status of PRACH target channel.

Command

```
[:SENSe]:RADio:TCHannel:PRACh <mode>
```

Parameter

<mode>	PRACH measurement	
INCLude	Include:	Measures
EXCLude	Exclude:	Does not measure (Default)

Details

This is available when Standard is LTE.

Example of Use

To set the status of PRACH target channel to Include.

```
RAD:TCH:PRAC INCL
```

[:SENSe]:RADio:TCHannel:PRACh?

Target Channel PRACH Query

Function

This command queries the status of PRACH target channel.

Query

```
[:SENSe]:RADio:TCHannel:PRACh?
```

Response

```
<mode>
```

Parameter

<mode>	PRACH measurement	
INCL	Include:	Measures
EXCL	Exclude:	Does not measure

Example of Use

To query the status of PRACH target channel.

```
RAD:TCH:PRAC?
> INCL
```

[:SENSe]:RADio:TCHannel:SRSignal INCLude|EXCLude

Target Channel Sounding Reference Signal

Function

This command sets the status of Sounding Reference Signal target channel.

Command

```
[:SENSe]:RADio:TCHannel:SRSignal <mode>
```

Parameter

<mode>	SRS measurement	
INCLude	Include:	Measures
EXCLude	Exclude:	Does not measure (Default)

Details

This is available when Standard is LTE.

Example of Use

To set the status of Sounding Reference Signal target channel to Include.

```
RAD:TCH:SRS INCL
```

[:SENSe]:RADio:TCHannel:SRSignal?

Target Channel Sounding Reference Signal Query

Function

This command queries the status of Sounding Reference Signal target channel.

Query

```
[:SENSe]:RADio:TCHannel:SRSignal?
```

Response

```
<mode>
```

Parameter

<mode>	SRS measurement	
INCL	Include:	Measures
EXCL	Exclude:	Does not measure

Example of Use

To query the status of Sounding Reference Signal target channel.

```
RAD:TCH:SRS?
> INCL
```

2.3.12 Reference Signal

:CALCulate:EVM:RSIGnal:ZCSequence:LENGth <integer>

Reference Signal Zadoff-Chu-Sequence Length

Function

This command sets the Zadoff-Chu-Sequence Length for the Include Channel.
This command is available when DMRS Parameters is Manual.
When the Include Channel is PUSCH, sets Zadoff-Chu-Sequence Length of all subframes collectively.
When the Include Channel is PRACH, this command is disabled because this is an unsupported channel.

Command

```
:CALCulate:EVM:RSIGnal:ZCSequence:LENGth <integer>
```

Parameter

`<integer>`	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	1193	(Channel Bandwidth: 20 MHz)
	887	(Channel Bandwidth: 15 MHz)
	599	(Channel Bandwidth: 10 MHz)
	293	(Channel Bandwidth: 5 MHz)
	179	(Channel Bandwidth: 3 MHz)
	71	(Channel Bandwidth: 1.4 MHz)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Zadoff-Chu-Sequence length to 10, whose channel is set to Include.

```
CALC:EVM:RSIG:ZCS:LENG 10
```

:CALCulate:EVM:RSIGnal:ZCSequence:LENGth?

Reference Signal Zadoff-Chu-Sequence Length Query

Function

This command queries the Zadoff-Chu-Sequence Length for the Include Channel. When the Include Channel is PUSCH, it queries Zadoff-Chu-Sequence Length of the first subframe.
When the Include Channel is PRACH, this command always returns "****" because this Channel is unsupported.

Query

```
:CALCulate:EVM:RSIGnal:ZCSequence:LENGth?
```

Response

```
<integer>
```

Parameter

<integer>	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the length of Zadoff-Chu-Sequence.

```
CALC:EVM:RSIG:ZCS:LENG?
> 10
```

:CALCulate:EVM:RSIGnal:SGRoup:NUMBer <integer>

Reference Signal Sequence Group Number

Function

This command sets the Reference Signal Sequence Group Number for all slots (Subframe for SRS) corresponding to the Include Channel collectively.
This command is available when DMRS Parameters is Manual.
When the Include Channel is PRACH, this command is disabled because it is an unsupported Channel.

Command

```
:CALCulate:EVM:RSIGnal:SGRoup:NUMBer <integer>
```

Parameter

`<integer>`	Sequence Group Number
Range	0 to 29
Resolution	1
Suffix code	None

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set 10 for the sequence group number of the reference signal.

```
CALC:EVM:RSIG:SGR:NUMB 10
```

:CALCulate:EVM:RSIGnal:SGRoup:NUMBer?

Reference Signal Sequence Group Number Query

Function

This command queries the Reference Signal Sequence Group Number for all slots (Subframe for SRS) corresponding to the Include Channel collectively. When the Include Channel is PRACH, this command always returns "****" because this Channel is not supported.

Query

```
:CALCulate:EVM:RSIGnal:SGRoup:NUMBer?
```

Response

```
<integer>
```

Parameter

<integer>	Sequence Group Number
Range	0 to 29
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Sequence Group Number by slot/subframe collectively.

```
CALC:EVM:RSIG:SGR:NUMB?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer <integer>

Reference Signal Base Sequence Number

Function

This command sets the Base Sequence Number for all slots (Subframe for SRS) corresponding to the Include Channel collectively.
This command is available when DMRS Parameters is Manual.
When the Include Channel is PUCCH, this command is disabled because this Channel is unsupported.

Command

```
:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer <integer>
```

Parameter

`<integer>`	Base Sequence Number
Range	0 to 1
Resolution	1
Suffix code	None
Default	0

Details

This command is available only when Number of RBs is set to 6 or greater.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set 1 for the base sequence number.

```
CALC:EVM:RSIG:BSEQ:NUMB 1
```

:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer?

Reference Signal Base Sequence Number Query

Function

This command queries the Reference Signal Base Sequence Number for all slots (Subframe for SRS) corresponding to the Include Channel collectively.
When the Include Channel is PRACH or PUCCH, this command always returns "****" because these are unsupported Channels.

Query

```
:CALCulate:EVM:RSIGnal:BSEQuence:NUMBer?
```

Response

```
<integer>
```

Parameter

<integer>	Base Sequence Number
Range	0 to 1
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Base Sequence Number by slot/subframe collectively.

```
CALC:EVM:RSIG:BSEQ:NUMB?
> 1,1,1,1,1,1,1,1,1,1
```

:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

Reference Signal Cyclic Shift Index

Function

This command changes the Cyclic Shift Index for the Include Channel specified slot.
This command is available when DMRS Parameters is Manual.
Only PUSCH is supported as the Include Channel. Any other Channel is unsupported and this command is disabled in these cases.

Command

```
:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

`<integer>`	Cyclic Shift Index
Range	0 to 11
Resolution	1
Suffix code	None

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Slot 0 Cyclic Shift Index to 10.

```
CALC:EVM:RSIG:CSH:SLOT 10
```

:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

Reference Signal Cyclic Shift Index Query

Function

This command queries the Cyclic Shift Index for the specified slot corresponding to the Include Channel. Only PUSCH is supported as the Include Channel.

Query

```
:CALCulate:EVM:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|
10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

<integer>	Cyclic Shift Index
Range	0 to 11
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Slot 0 Cyclic Shift Index.

```
CALC:EVM:RSIG:CSH:SLOT?
> 10
```

2.3.13 Reference Signal PUSCH

:CALCulate:EVM:PUSCh:RSIGnal:AUTO OFF|ON|0|1

PUSCH DMRS Parameters

Function

This command configures the DMRS Parameter setting for PUSCH measurement.
This command is available when Target Channel is PUSCH.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:AUTO <switch>
```

Parameter

<switch>	DMRS Parameters setting
OFF|0	Sets DMRS Parameters to Manual .
ON|1	Sets DMRS Parameters to Auto. (default)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the DMRS Parameters setting for PUSCH measurement to Auto.

```
:CALC:EVM:PUSC:RSIG:AUTO 1
```

:CALCulate:EVM:PUSCh:RSIGnal:AUTO?

PUSCH DMRS Parameters Query

Function

This command queries the DMRS Parameter setting for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:AUTO?
```

Response

```
<switch>
```

Parameter

<switch>	DMRS Parameter setting
0	DMRS Parameters Manual
1	DMRS Parameters Auto

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the DMRS Parameter setting for PUSCH measurement.

```
:CALC:EVM:PUSC:RSIG:AUTO?
> 1
```

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

PUSCH Auto Calculate Params Cell ID

Function

This command sets the Cell ID for PUSCH measurement.

Command

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

Parameter

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

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is used to automatically set its parameters.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Cell ID to 0 for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:CELL 0
```

:CALCulate:EVM:PUSCh:RSIGnal:CELLid?

PUSCH Auto Calculate Params Cell ID Query

Function

This command queries the Cell ID for PUSCH measurement.

Query

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

Response

```
<integer>
```

Parameter

<integer>	Cell ID
Range	0 to 503
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To set the Cell ID for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:CELL?
> 0
```

:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2 <integer>

PUSCH Auto Calculate Params DMRS

Function

This command sets the value of n_DMRS1 and n_DMRS2 for PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2 <integer>
```

Parameter

`<integer>`	n_DMRS1, n_DMRS2 for PUSCH measurement
Range	0 to 10 (but 1, 5, and 7 cannot be set).
Resolution	1
Suffix code	None
Default	0

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is used to automatically set its parameters.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of n_DMRS1 to 6 for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:DMRS1 6
```

:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2?

PUSCH Auto Calculate Params DMRS Query

Function

This command queries the value of n_DMRS1 and n_DMRS2 for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:DMRS1|DMRS2?
```

Response

```
<integer>
```

Parameter

<integer>	n_DMRS1, n_DMRS2 for PUSCH measurement
Range	0 to 10
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the value of n_DMRS1 for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:DMRS1?
> 6
```

:CALCulate:EVM:PUSCh:RSIGnal:DSS <integer>

PUSCH Auto Calculate Params Delta SS

Function

This command sets the Delta SS value for PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:DSS <integer>
```

Parameter

`<integer>`	Delta SS
Range	0 to 29
Resolution	1
Suffix code	None
Default	0

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is used to automatically set its parameters.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of Delta SS to 10 for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:DSS 10
```

:CALCulate:EVM:PUSCh:RSIGnal:DSS?

PUSCH Auto Calculate Params Delta SS Query

Function

This command queries the Delta SS value for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:DSS?
```

Response

```
<integer>
```

Parameter

`<integer>`	Delta SS
Range	0 to 29
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Delta SS value for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:DSS?
> 6
```

:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing OFF|ON|0|1

PUSCH Auto Calculate Params Sequence Hopping

Function

This command disables/enables Sequence Hopping for PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing <mode>
```

Parameter

<mode>	Sequence Hopping setting
OFF|0	Disabled (Enabled)
ON|1	Enabled

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is used to automatically set its parameters.
This Parameter is changed automatically to Disabled when PUSCH Group Hopping is changed to Enabled.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To enable Sequence Hopping of PUSCH.

```
CALC:EVM:PUSC:RSIG:BSEQ:HOPP ON
```

:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing?

PUSCH Auto Calculate Params Sequence Hopping Query

Function

This command queries the Sequence Hopping status for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:HOPPing?
```

Response

```
<mode>
```

Parameter

<mode>	Sequence Hopping
0	Disabled
1	Enabled

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Sequence Hopping status for PUSCH.

```
CALC:EVM:PUSC:RSIG:BSEQ:HOPP?
> 1
```

:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1

PUSCH Auto Calculate Params Group Hopping

Function

This command disables/enables Group Hopping for PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing <switch>
```

Parameter

<switch>	Group Hopping setting
OFF|0	Disabled
ON|1	Enabled (Enabled)

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is used to automatically set its parameters.
This parameter is changed automatically to Disabled when PUSCH Sequence Hopping is changed to Enabled.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To enable Group Hopping of PUSCH.

```
CALC:EVM:PUSC:RSIG:SGR:HOPP ON
```

:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing?

PUSCH Auto Calculate Params Group Hopping Query

Function

This command queries the Group Hopping status.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:HOPPing?
```

Response

```
<mode>
```

Parameter

<mode>	Group Hopping
0	Disabled
1	Enabled

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Group Hopping status for PUSCH.

```
CALC:EVM:PUSC:RSIG:SGR:HOPP?
> 1
```

:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth <integer>

PUSCH Reference Signal Zadoff-Chu-Sequence Length

Function

This command sets Zadoff-Chu-Sequence Length of all subframes for PUSCH measurement collectively.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth <integer>
```

Parameter

<integer>	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	1193	(Channel Bandwidth: 20 MHz)
	887	(Channel Bandwidth: 15 MHz)
	599	(Channel Bandwidth: 10 MHz)
	293	(Channel Bandwidth: 5 MHz)
	179	(Channel Bandwidth: 3 MHz)
	71	(Channel Bandwidth: 1.4 MHz)

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is unnecessary because Zadoff-Chu-Sequence Length is calculated automatically.

When Standard is LTE-A, this can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Zadoff-Chu-Sequence Length of all subframes for PUSCH measurement to 10 collectively.

```
CALC:EVM:PUSC:RSIG:ZCS:LENG 10
```

:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth?

PUSCH Reference Signal Zadoff-Chu-Sequence Length Query

Function

This command queries Zadoff-Chu-Sequence Length of the first subframe for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth?
```

Response

```
<integer>
```

Parameter

`<integer>`		Zadoff-Chu-Sequence Length
	Range	1 to 1320 (Channel Bandwidth: 20 MHz) 1 to 990 (Channel Bandwidth: 15 MHz) 1 to 660 (Channel Bandwidth: 10 MHz) 1 to 330 (Channel Bandwidth: 5 MHz) 1 to 198 (Channel Bandwidth: 3 MHz) 1 to 79 (Channel Bandwidth: 1.4 MHz)
	Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Zadoff-Chu-Sequence of the first subframe for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:ZCS:LENG?
> 10
```

:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUSCH Reference Signal Zadoff-Chu-Sequence Length Subframe0-9

Function

This command sets Zadoff-Chu-Sequence Length of each subframe for PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

`<integer>`	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	1193	(Channel Bandwidth: 20 MHz)
	887	(Channel Bandwidth: 15 MHz)
	599	(Channel Bandwidth: 10 MHz)
	293	(Channel Bandwidth: 5 MHz)
	179	(Channel Bandwidth: 3 MHz)
	71	(Channel Bandwidth: 1.4 MHz)

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is unnecessary because Zadoff-Chu-Sequence Length is calculated automatically.

When Standard is LTE-A, this can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Zadoff-Chu-Sequence Length of Subframe 0 for PUSCH measurement to 10.

```
CALC:EVM:PUSC:RSIG:ZCS:LENG:SUBF0 10
```

:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUSCH Reference Signal Zadoff-Chu-Sequence Length Subframe0-9 Query

Function

This command queries Zadoff-Chu-Sequence Length of each subframe for PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:ZCSequence:LENGth?
```

Response

```
<integer>
```

Parameter

`<integer>`	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Zadoff-Chu-Sequence Length of Subframe 0 for PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:ZCS:LENG:SUBF0?
> 10
```

:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUSCH Sequence Group Number Slot

Function

This command sets the Sequence Group Number for each PUSCH measurement slot.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

`<integer>`	Sequence Group Number
Range	0 to 29
Resolution	1
Suffix code	None

Details

When PUSCH DMRS Parameters is set to Auto ON, setting is unnecessary because Sequence Group Number is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Sequence Group Number for PUSCH measurement Slot 0 to 10.

```
CALC:EVM:PUSC:RSIG:SGR:NUMB:SLOT 10
```

:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUSCH Sequence Group Number Slot Query

Function

This command queries the Sequence Group Number for each PUSCH measurement slot.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

`<integer>`		Sequence Group Number
	Range	0 to 29
	Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Sequence Group Number for PUSCH measurement Slot 0.

```
CALC:EVM:PUSC:RSIG:SGR:NUMB:SLOT?
> 10
```

:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUSCH Base Sequence Number Slot

Function

This command sets the Base Sequence Number for each PUSCH measurement slot.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

`<integer>`	Base Sequence Number
Range	0 to 1
Resolution	1
Suffix code	None
Default	0

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is unnecessary because the Base Sequence Number is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Base Sequence Number for PUSCH measurement Slot 0 to 1.

```
CALC:EVM:PUSC:RSIG:BSEQ:NUMB:SLOT 1
```

:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUSCH Base Sequence Number Slot Query

Function

This command queries the Base Sequence Number for each PUSCH measurement slot.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:BSEQuence:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

`<integer>`	Base Sequence Number
Range	0 to 1
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Sequence Group Number for PUSCH measurement Slot 0.

```
CALC:EVM:PUSC:RSIG:BSEQ:NUMB:SLOT?
>1
```

:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUSCH Reference Signal Cyclic Shift Index

Function

This command set the Cyclic Shift Index for each PUSCH measurement slot.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

`<integer>`	Cyclic Shift Index
Range	0 to 11
Resolution	1
Suffix code	None

Details

When PUSCH DMRS Parameters is set to Auto ON, this setting is unnecessary because Cyclic Shift Index is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Cyclic Shift Index for PUSCH measurement Slot 0 to 10.

```
CALC:EVM:PUSC:RSIG:CSH:SLOT 10
```

:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUSCH Reference Signal Cyclic Shift Index Query

Function

This command queries the Cyclic Shift Index for each PUSCH measurement slot.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:CSHift:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

`<integer>`	Cyclic Shift Index
Range	0 to 11
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Cyclic Shift Index for PUSCH measurement Slot 0.

```
CALC:EVM:PUSC:RSIG:CSH:SLOT?
> 10
```

[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1

PUSCH DMRS Parameters - Subframe0-9 Assignment

Function

This command sets whether to target every Subframe of PUSCH measurement for the measurement.

Command

```
[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <switch>
```

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Subframe 3 as the measurement target.

```
RAD:PUSC:ASS:SUBF3 ON
```

[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUSCH DMRS Parameters - Subframe0-9 Assignment Query

Function

This command queries whether to target every Subframe of PUSCH measurement for the measurement.

Query

```
[:SENSe]:RADio:PUSCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<switch>
```

Parameter

<switch>	Measurement On/Off
0	Off
1	On

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query whether Subframe 3 is the measurement target or not.

```
RAD:PUSC:ASS:SUBF3?
> 1
```

[:SENSe]:RADio:PUSCh:ASSignment OFF|ON|0|1

PUSCH DMRS Parameters - Subframe All Assignment

Function

This command sets whether to target all Subframes of PUSCH measurement for the measurement.

Command

```
[:SENSe]:RADio:PUSCh:ASSignment <switch>
```

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set all Subframes as the measurement target.

```
RAD:PUSC:ASS ON
```

[:SENSe]:RADio:PUSCh:ASSignment?

PUSCH DMRS Parameters - Subframe All Assignment Query

Function

This command queries whether to target all Subframes of PUSCH measurement for the measurement.

Query

```
[:SENSe]:RADio:PUSCh:ASSignment?
```

Response

```
<switch>
```

Parameter

<switch>	Measurement On/Off
0	Off
1	On

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query whether all the Subframes are the measurement target or not.

```
RAD:PUSC:ASS?
> 1,1,1,1,1,1,1,1,1,1
```

2.3.14 Reference Signal PUCCH

:CALCulate:EVM:PUCCh:RSIGnal:AUTO OFF|ON|0|1

PUCCH DMRS Parameters

Function

This command configures DMRS Parameter setting for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:AUTO <switch>
```

Parameter

<switch>	DMRS Parameters setting
OFF|0	Sets DMRS Parameters to Manual.
ON|1	Sets DMRS Parameters to Auto. (Default)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the DMRS Parameters setting for PUCCH measurement to Auto.

```
:CALC:EVM:PUCC:RSIG:AUTO 1
```

:CALCulate:EVM:PUCCh:RSIGnal:AUTO?

PUCCH DMRS Parameters Query

Function

This command queries the DMRS Parameter setting for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:AUTO?
```

Response

```
<switch>
```

Parameter

<switch>	DMRS Parameter setting
0	DMRS Parameters Manual
1	DMRS Parameters Auto

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the DMRS Parameter setting for PUCCH measurement.

```
:CALC:EVM:PUCC:RSIG:AUTO?
> 1
```

:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth <integer>

PUCCH Reference Signal Zadoff-Chu-Sequence Length

Function

This command sets the Zadoff-chu sequence length for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth <integer>
```

Parameter

<integer>	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	11	

Details

When PUCCH DMRS DMRS Parameters is set to Auto ON, this setting is unnecessary because Zadoff-Chu-Sequence Length is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Zadoff-chu sequence length for PUCCH measurement to 11.

```
CALC:EVM:PUCC:RSIG:ZCS:LENG 11
```

:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth?

PUCCH Reference Signal Zadoff-Chu-Sequence Length Query

Function

This command queries the Zadoff-chu sequence length for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:ZCSequence:LENGth?
```

Response

```
<integer>
```

Parameter

`<integer>`	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the length of Zadoff-Chu-Sequence for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:ZCS:LENG?
> 11
```

:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUCCH Sequence Group Number Slot

Function

This command sets Sequence Group Number for each PUCCH slot number.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

<integer>	Sequence Group Number
Range	0 to 29
Resolution	1
Suffix code	None

Details

When PUCCH DMRS Parameters is set to Auto ON, this setting is unnecessary because Sequence Group Number is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Sequence Group Number for PUCCH measurement Slot 0 to 10.

```
CALC:EVM:PUCC:RSIG:SGR:NUMB:SLOT 10
```

:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUCCH Sequence Group Number Slot Query

Function

This command queries Sequence Group Number for each PUCCH slot number.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:NUMBer:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

`<integer>`		Sequence Group Number
	Range	0 to 29
	Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Sequence Group Number for PUCCH measurement Slot 0.

```
CALC:EVM:PUCC:RSIG:SGR:NUMB:SLOT?
> 10
```

:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol1|2|3|4|5|8|9|10|11|12|13 <integer>

PUCCH Reference Signal Cyclic Shift Index

Function

This command sets the Cyclic Shift Index to any Symbol for each PCCH measurement Subframe.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9:SYMBol1|2|3|4|5|8|9|10|11|12|13 <integer>
```

Parameter

`<integer>`	Cyclic Shift Index
Range	0 to 11
Resolution	1
Suffix code	None

Details

When PUCCH DMRS Parameters is set to Auto ON, this is unnecessary because Cyclic Shift Index is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set PUCCH measurement Subframe 3, Symbol 2 Cyclic Shift Index to 10.

```
CALC:EVM:PUCC:RSIG:CSH:SUBF3:SYMB2 10
```

:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol1|2|3|4|5|8|9|10|11|12|13?

PUCCH Reference Signal Cyclic Shift Index Query

Function

This command queries the Cyclic Shift Index for any Symbol of each Subframe for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:SUBFrame[0]|1|2|3|4|5|6|7|8|9:SYMBol1|2|3|4|5|8|9|10|11|12|13?
```

Parameter

`<integer>`	Cyclic Shift Index
Range	0 to 11
Resolution	1
Suffix code	None

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query PUCCH measurement Subframe 3, Symbol 2 Cyclic Shift Index.

```
CALC:EVM:PUCC:RSIG:CSH:SUBF3:SYMB2?
> 10
```

:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer>

PUCCH Reference Signal - Cell-specific Cyclic Shift

Function

This command sets Cell-specific Cyclic Shift for arbitrary symbol of each subframe for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13 <integer>
```

Parameter

<integer>	Cell-specific Cyclic Shift
Range	0 to 255
Resolution	1
Suffix code	None

Details

This can be set when MX269021A-001 is installed and PUCCH Format is 3.
When PUCCH DMRS Parameters is set to Auto ON, this is unnecessary because Cell-specific Cyclic Shift is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Cell-specific Cyclic Shift of Symbol 2 in Subframe 3 for PUCCH measurement to 10.

```
CALC:EVM:PUCC:RSIG:CSH:CSP:SUBF3:SYMB2 10
```

:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13?

PUCCH Reference Signal - Cell-specific Cyclic Shift Query

Function

This command queries the setting of Cell-specific Cyclic Shift for arbitrary symbol of each subframe for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:CSHift:CSPecific:SUBFrame[0]|1|2|3|4|5|6|7|8|9|:SYMBol[0]|1|2|3|4|5|6|7|8|9|10|11|12|13?
```

Parameter

<integer>	Cell-specific Cyclic Shift
Range	0 to 255
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Cell-specific Cyclic Shift of Symbol 2 in Subframe 3 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:CSH:CSP:SUBF3:SYMB2?
> 10
```

:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUCCH Reference Signal - Scramble Code S(ns)

Function

This command sets Scramble Code of each slot for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

<integer>	Scramble Code
Range	0 to 1
Resolution	1
Suffix code	None
Default	0

Details

When PUCCH DMRS Parameters is set to Auto ON, this is unnecessary because Cell-specific Cyclic Shift is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Scramble Code of Slot0 for PUCCH measurement to 0.

```
CALC:EVM:PUCC:RSIG:SCR:SLOT 0
```

:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUCCH Reference Signal - Scramble Code S(ns) Query

Function

This command queries Scramble Code of each slot for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:SCRamble:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Parameter

<integer>	Scramble Code
Range	0 to 1
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query Scramble Code of Slot0 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:SCR:SLOT?
> 0
```

:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>

PUCCH Reference Signal Orthogonal Sequence Index

Function

This command sets the Orthogonal Sequence Index for each PUCCH measurement slot.
This command is unavailable when PUCCH Format is 2, 2a, or 2b.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19 <integer>
```

Parameter

<integer>	Orthogonal Sequence Index	
Range	0 to 2	(PUCCH Format = 1, 1a, 1b)
	0 to 4	(PUCCH Format = 3)
Resolution	1	
Suffix code	None	

Details

When PUCCH DMRS Parameters is set to Auto ON, this setting is unnecessary because the Orthogonal Sequence Index is calculated automatically.
When Standard is LTE-A, this can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Orthogonal Sequence Index for PUCCH measurement Slot 0 to 1.

```
CALC:EVM:PUCC:RSIG:OSEQ:SLOT 1
```

:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?

PUCCH Reference Signal Orthogonal Sequence Index Query

Function

This command queries the Orthogonal Sequence Index for each PUCCH measurement slot.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:OSEQuence:SLOT[0]|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19?
```

Response

```
<integer>
```

Parameter

`<integer>`	Orthogonal Sequence Index	
Range	0 to 2	(PUCCH Format = 1, 1a, 1b)
	0 to 4	(PUCCH Format = 3)
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Orthogonal Sequence Index for PUCCH measurement slot 0.

```
CALC:EVM:PUCC:RSIG:OSEQ:SLOT?
> 1
```

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

PUCCH Auto Calculate Params Cell ID

Function

This command sets the Cell ID for PUCCH measurement.

Command

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

Parameter

<integer>	Cell Id
Range	0 to 503
Resolution	1
Suffix code	None
Default	0

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Cell ID to 0 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:CELL 0
```

:CALCulate:EVM:PUCCh:RSIGnal:CELLid?

PUCCH Auto Calculate Params Cell ID Query

Function

This command queries the Cell ID for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:CELL?
```

Response

```
<integer>
```

Parameter

`<integer>`	Cell Id
Range	0 to 503
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To set the Cell ID for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:CELL?
> 0
```

:CALCulate:EVM:PUCCh:RSIGnal:NCS1 <integer>

PUCCH Auto Calculate Params N_cs_1

Function

This command sets the N_cs_1 value for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:NCS1 <integer>
```

Parameter

<integer>	N_cs_1
Range	0 to 7
Resolution	1
Suffix code	None
Default	0

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of N_cs_1 to 0 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NCS1 0
```

:CALCulate:EVM:PUCCh:RSIGnal:NCS1?

PUCCH Auto Calculate Params N_cs_1 Query

Function

This command queries the N_cs_1 value for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:NCS1?
```

Response

```
<integer>
```

Parameter

`<integer>`	N_cs_1
Range	0 to 7
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the N_cs_1 value for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NCS1?
> 0
```

:CALCulate:EVM:PUCCh:RSIGnal:NRB2 <integer>

PUCCH Auto Calculate Params N_RB_2

Function

This command sets the N_RB_2 value for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:NRB2 <integer>
```

Parameter

<integer>	N_RB_2	
Range	0 to 98	(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	8	(Channel Bandwidth: 20 MHz)
	6	(Channel Bandwidth: 15 MHz)
	4	(Channel Bandwidth: 10 MHz)
	2	(Channel Bandwidth: 5 MHz)
	2	(Channel Bandwidth: 3 MHz)
	2	(Channel Bandwidth: 1.4 MHz)

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
The minimum value is 1 when N_cs_1 is 0.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of N_RB_2 to 5 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NRB2 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NRB2?

PUCCH Auto Calculate Params N_RB_2 Query

Function

This command queries the N_RB_2 value for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:NRB2?
```

Response

```
<integer>
```

Parameter

`<integer>`	N_RB_2	
Range	0 to 98	(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	

Details

The minimum value is 1 when N_cs_1 is 0.
When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the N_RB_2 value for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NRB2?
> 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2 <integer>

PUCCH Auto Calculate Params n_PUCCH

Function

This command sets the value of n_PUCCH_1 and n_PUCCH_2 for PUCCH measurement. The setting is performed for all subframes collectively.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2 <integer>
```

Parameter

<integer>	n_PUCCH_1	
Range	0 to 7199	(Channel Bandwidth: 20 MHz)
	0 to 5399	(Channel Bandwidth: 15 MHz)
	0 to 3599	(Channel Bandwidth: 10 MHz)
	0 to 1799	(Channel Bandwidth: 5 MHz)
	0 to 1079	(Channel Bandwidth: 3 MHz)
	0 to 431	(Channel Bandwidth: 1.4 MHz)
	n_PUCCH_2	
Range	0 to (N_RB_2×12+Ceiling(N_cs_1/8)×(12–N_cs_1–2)–1)	
Resolution	1	
Suffix code	None	
Default	0	

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of n_PUCCH_1 to 5 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NPUC1 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2?

PUCCH Auto Calculate Params n_PUCCH Query

Function

This command queries the n_PUCCH_1 or n_PUCCH_2 value for every subframe of PUCCH measurement collectively.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1|2?
```

Response

```
<integer>
```

Parameter

`<integer>`	n_PUCCH_1	
Range	0 to 7199	(Channel Bandwidth 20 MHz)
	0 to 5399	(Channel Bandwidth 15 MHz)
	0 to 3599	(Channel Bandwidth 10 MHz)
	0 to 1799	(Channel Bandwidth 5 MHz)
	0 to 1079	(Channel Bandwidth 3 MHz)
	0 to 431	(Channel Bandwidth 1.4 MHz)
	n_PUCCH_2	
Range	0 to (N_RB_2×12+Ceiling(N_cs_1/8)×(12–N_cs_1–2)–1)	
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the n_PUCCH_1 value for every subframe of PUCCH measurement collectively.

```
CALC:EVM:PUCC:RSIG:NPUC1?
> 5,5,5,5,5,5,5,5,5,5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUCCH Auto Calculate Params n_PUCCH1

Function

This command sets the n_PUCCH_1 value for every subframe of PUCCH measurement individually.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

<integer>	n_PUCCH_1	
Range	0 to 7199	(Channel Bandwidth 20 MHz)
	0 to 5399	(Channel Bandwidth 15 MHz)
	0 to 3599	(Channel Bandwidth 10 MHz)
	0 to 1799	(Channel Bandwidth 5 MHz)
	0 to 1079	(Channel Bandwidth 3 MHz)
	0 to 431	(Channel Bandwidth 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	0	

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the n_PUCCH_1 value for Subframe0 of PUCCH measurement to 5.

```
CALC:EVM:PUCC:RSIG:NPUC1:SUBF 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUCCH Auto Calculate Params n_PUCCH1 Query

Function

This command queries the n_PUCCH_1 value for every subframe of PUCCH measurement individually.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch1:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`	n_PUCCH_1	
Range	0 to 7199	(Channel Bandwidth 20 MHz)
	0 to 5399	(Channel Bandwidth 15 MHz)
	0 to 3599	(Channel Bandwidth 10 MHz)
	0 to 1799	(Channel Bandwidth 5 MHz)
	0 to 1079	(Channel Bandwidth 3 MHz)
	0 to 431	(Channel Bandwidth 1.4 MHz)
Resolution	1	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the n_PUCCH_1 value for Subframe0 of PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NPUC1:SUBF?
> 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUCCH Auto Calculate Params n_PUCCH3

Function

This command sets the n_PUCCH_3 value for every subframe of PUCCH measurement individually.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

<integer>	n_PUCCH_2	
Range	0 to 499	(Channel Bandwidth 20 MHz)
	0 to 374	(Channel Bandwidth 15 MHz)
	0 to 249	(Channel Bandwidth 10 MHz)
	0 to 124	(Channel Bandwidth 5 MHz)
	0 to 74	(Channel Bandwidth 3 MHz)
	0 to 29	(Channel Bandwidth 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	0	

Details

This can be set when MX269021A-001 is installed, Standard is LTE-A, and PUCCH Format is 3.
When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
This can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the n_PUCCH_3 value for Subframe0 of PUCCH measurement to 5.

```
CALC:EVM:PUCC:RSIG:NPUC3:SUBF 5
```

:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUCCH Auto Calculate Params n_PUCCH3 Query

Function

This command queries the n_PUCCH_3 value for every subframe of PUCCH measurement individually.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:NPUCch3:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`	n_PUCCH_3	
Range	0 to 499	(Channel Bandwidth 20 MHz)
	0 to 374	(Channel Bandwidth 15 MHz)
	0 to 249	(Channel Bandwidth 10 MHz)
	0 to 124	(Channel Bandwidth 5 MHz)
	0 to 74	(Channel Bandwidth 3 MHz)
	0 to 29	(Channel Bandwidth 1.4 MHz)
Resolution	1	

Details

This can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the n_PUCCH_3 value for Subframe0 of PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:NPUC3:SUBF?
> 5
```

:CALCulate:EVM:PUCCh:RSIGnal:DSHift <integer>

PUCCH Auto Calculate Params Delta Shift

Function

This command sets the Delta Shift PUCCH value.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:DSHift <integer>
```

Parameter

<integer>	Delta Shift
Range	1 to 3
Resolution	1
Suffix code	None
Default	2

Details

When PUCCH DMRS Parameters is set to Auto ON, the PUCCH DMRS Parameters automatic calculation is used.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the value of `nDelta Shift` to 1 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:DSH 1
```

:CALCulate:EVM:PUCCh:RSIGnal:DSHift?

PUCCH Auto Calculate Params Delta Shift Query

Function

This command queries the Delta Shift PUCCH value.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:DSHift?
```

Response

```
<integer>
```

Parameter

<integer>	Delta Shift
Range	1 to 3
Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Delta Shift PUCCH value.

```
CALC:EVM:PUCC:RSIG:DSH?
> 1
```

[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1

PUCCH DMRS Parameters - Subframe0-9 Assignment

Function

This command sets whether to measure each subframe of PUCCH measurement individually.

Command

```
[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <switch>
```

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the measurement of Subframe0 to On for PUCCH measurement.

```
RAD:PUCC:ASS:SUBF0 ON
```

[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUCCH DMRS Parameters - Subframe0-9 Assignment Query

Function

This command queries whether to measure each subframe of PUCCH measurement individually.

Query

```
[:SENSe]:RADio:PUCCh:ASSignment:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<switch>
```

Parameter

`<switch>`	Measurement On/Off
`0`	Off
`1`	On

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query whether to measure subframe0 in PUCCH measurement.

```
RAD:PUCC:ASS:SUBF?
> 1
```

[:SENSe]:RADio:PUCCh:ASSignment OFF|ON|0|1

PUCCH DMRS Parameters - Subframe All Assignment

Function

This command sets whether to measure all subframes of PUCCH measurement collectively.

Command

```
[:SENSe]:RADio:PUCCh:ASSignment <switch>
```

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the measurement of all subframes to On for PUCCH measurement collectively.

```
RAD:PUCC:ASS ON
```

[:SENSe]:RADio:PUCCh:ASSignment?

PUCCH DMRS Parameters - Subframe All Assignment Query

Function

This command queries whether to measure each subframe of PUCCH measurement collectively.

Query

```
[:SENSe]:RADio:PUCCh:ASSignment?
```

Response

```
<switch>
```

Parameter

<switch>	Measurement On/Off
0	Off
1	On

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query whether to measure each subframe of PUCCH measurement collectively.

```
RAD:PUCC:ASS?
> 1,1,1,1,1,1,1,1,1,1
```

:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing OFF|ON|0|1

PUCCH Group Hopping

Function

This command disables/enables Group Hopping for PUCCH measurement.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing <mode>
```

Parameter

<mode>	Group Hopping setting
OFF|0	Disabled
ON|1	Enabled (Enabled)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To enable Group Hopping for PUCCH.

```
CALC:EVM:PUCC:RSIG:SGR:HOPP ON
```

:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing?

PUCCH Group Hopping Query

Function

This command queries the Group Hopping status for PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:SGRoup:HOPPing?
```

Response

```
<mode>
```

Parameter

<mode>	Group Hopping
0	Disabled
1	Enabled

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Group Hopping status for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:SGR:HOPP?
> 1
```

2.3.15 PRACH

:CALCulate:EVM:PRACh:CONFiguration <integer>

PRACH Configuration

Function

This command sets the Configuration value for PRACH measurement.

Command

```
:CALCulate:EVM:PRACh:CONFiguration <integer>
```

Parameter

<integer>	PRACH Configuration
Range	0 to 63 (Except 30, 46, 60, 61, 62)
Resolution	1
Suffix code	None
Default	3

Details

This can be set when Standard is LTE.
PRACH Format corresponds to PRACH Configuration as below.
PRACH Format0: 0 to 15
PRACH Format1: 16 to 31
PRACH Format2: 32 to 47
PRACH Format3: 48 to 63

Example of Use

To set the Configuration value for PRACH to 10.

```
CALC:EVM:PRAC:CONF 10
```

:CALCulate:EVM:PRACh:CONFiguration?

PRACH Configuration Query

Function

This command queries the Configuration value for PRACH measurement.

Query

```
:CALCulate:EVM:PRACh:CONFiguration?
```

Response

```
<integer>
```

Parameter

<integer>	PRACH Configuration
Range	0 to 63 (Except 30, 46, 60, 61, 62)
Resolution	1

Example of Use

To query the Configuration value for PRACH.

```
CALC:EVM:PRAC:CONF?
> 10
```

:CALCulate:EVM:PRACh:PRSequence:NUMBer <integer>

PRACH Physical Root Sequence Number

Function

This command sets the Physical Root Sequence Number value for PRACH measurement.

Command

```
:CALCulate:EVM:PRACh:PRSequence:NUMBer <integer>
```

Parameter

`<integer>`	Physical Root Sequence Number
Range	1 to 838
Resolution	1
Suffix code	None
Default	1

Details

This can be set when Standard is LTE.

Example of Use

To set the Physical Root Sequence Number for PRACH to 10.

```
CALC:EVM:PRAC:PRS:NUMB 10
```

:CALCulate:EVM:PRACh:PRSequence:NUMBer?

PRACH Physical Root Sequence Number Query

Function

This command queries the Physical Root Sequence Number value for PRACH measurement.

Query

```
:CALCulate:EVM:PRACh:PRSequence:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`	Physical Root Sequence Number
Range	1 to 838
Resolution	1

Example of Use

To query the Physical Root Sequence Number for PRACH.

```
CALC:EVM:PRAC:PRS:NUMB?
> 10
```

:CALCulate:EVM:PRACh:CSHift <integer>

PRACH Cyclic Shift Value

Function

This command sets the Cyclic Shift Value for PRACH measurement.

Command

```
:CALCulate:EVM:PRACh:CSHift <integer>
```

Parameter

<integer>	Cyclic Shift Value
Range	0 to 838
Resolution	1
Suffix code	None
Default	806

Details

This can be set when Standard is LTE.

Example of Use

To set the Cyclic Shift Value for PRACH measurement to 10.

```
CALC:EVM:PRAC:CSH 10
```

:CALCulate:EVM:PRACh:CSHift?

PRACH Cyclic Shift Value Query

Function

This command queries the Cyclic Shift Value for PRACH measurement.

Query

```
:CALCulate:EVM:PRACh:CSHift?
```

Response

```
<integer>
```

Parameter

<integer>	Cyclic Shift Value
Range	0 to 838
Resolution	1

Example of Use

To query the Cyclic Shift Value for PRACH measurement.

```
CALC:EVM:PRAC:CSH?
> 10
```

2.3.16 Sounding Reference Signal

:CALCulate:EVM:SRSignal:AUTO OFF|ON|0|1

Sounding Reference Signal DMRS Parameters

Function

This command configures the DMRS Parameters settings for Sounding Reference Signal (SRS) measurement.

Command

```
:CALCulate:EVM:SRSignal:AUTO <switch>
```

Parameter

<switch>	DMRS Parameters setting
OFF|0	Sets DMRS Parameters to Manual .
ON|1	Sets DMRS Parameters to Auto (Default).

Details

This can be set when Standard is LTE.

Example of Use

To set DMRS Parameters at Sounding Reference Signal Measurement to Auto.

```
:CALC:EVM:SRS:AUTO 1
```

:CALCulate:EVM:SRSignal:AUTO?

Sounding Reference Signal DMRS Parameters Query

Function

This command queries the DMRS Parameters settings for Sounding Reference Signal (SRS) measurement.

Query

```
:CALCulate:EVM:SRSignal:AUTO?
```

Response

```
<switch>
```

Parameter

<switch>	DMRS setting
0	DMRS Parameters Manual
1	DMRS Parameters Auto

Example of Use

To query the DMRS Parameters settings for Sounding Reference Signal measurement.

```
:CALC:EVM:SRS:AUTO?
> 1
```

:CALCulate:EVM:SRSignal:ZCSequence:LENGth <integer>

Sounding Reference Signal Zadoff-Chu-Sequence Length

Function

This command sets the Sounding Reference Signal measurement Zadoff-Chu-Sequence Length

Command

```
:CALCulate:EVM:SRSignal:ZCSequence:LENGth <integer>
```

Parameter

`<integer>`	Zadoff-Chu-Sequence Length	
Range	1 to 1320	(Channel Bandwidth: 20 MHz)
	1 to 990	(Channel Bandwidth: 15 MHz)
	1 to 660	(Channel Bandwidth: 10 MHz)
	1 to 330	(Channel Bandwidth: 5 MHz)
	1 to 198	(Channel Bandwidth: 3 MHz)
	1 to 79	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	571	(Channel Bandwidth: 20 MHz)
	431	(Channel Bandwidth: 15 MHz)
	283	(Channel Bandwidth: 10 MHz)
	139	(Channel Bandwidth: 5 MHz)
	71	(Channel Bandwidth: 3 MHz)
	23	(Channel Bandwidth: 1.4 MHz)

Details

This is available when Standard is LTE.
When SRS DMRS Parameters is set to Auto ON, this setting is unnecessary because Zadoff-Chu-Sequence Length is calculated automatically.

Example of Use

To set Sounding Reference Signal measurement Zadoff-Chu-Sequence Length to 10.

```
CALC:EVM:SRS:ZCS:LENG 10
```

:CALCulate:EVM:SRSignal:ZCSequence:LENGth?

Sounding Reference Signal Zadoff-Chu-Sequence Length Query

Function

This command queries the Sounding Reference Signal measurement Zadoff-Chu-Sequence.

Query

```
:CALCulate:EVM:SRSignal:ZCSequence:LENGth?
```

Response

```
<integer>
```

Parameter

`<integer>`		Zadoff-Chu-Sequence Length
	Range	1 to 1320 (Channel Bandwidth: 20 MHz) 1 to 990 (Channel Bandwidth: 15 MHz) 1 to 660 (Channel Bandwidth: 10 MHz) 1 to 330 (Channel Bandwidth: 5 MHz) 1 to 198 (Channel Bandwidth: 3 MHz) 1 to 79 (Channel Bandwidth: 1.4 MHz)
	Resolution	1

Example of Use

To query Sounding Reference Signal measurement Zadoff-Chu-Sequence.

```
CALC:EVM:SRS:ZCS:LENG?
> 10
```

:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

Sounding Reference Signal Sequence Group Number Subframe

Function

This command sets the Sequence Group Number for each subframe for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

<integer>	Sequence Group Number
Range	0 to 29
Resolution	1
Suffix code	None

Details

This is available when Standard is LTE.
When SRS DMRS Parameters is set to Auto ON, this setting is unnecessary because Sequence Group Number is calculated automatically.

Example of Use

To set Sequence Group Number for Sounding Reference Signal measurement subframe 3 to 10.

```
CALC:EVM:SRS:SGR:NUMB:SUBF3 10
```

:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

Sounding Reference Signal Sequence Group Number Subframe Query

Function

This command queries the Sequence Group Number for each Sounding Reference Signal measurement subframe.

Query

```
:CALCulate:EVM:SRSignal:SGRoup:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`	Sequence Group Number
Range	0 to 29
Resolution	1

Example of Use

To query Sequence Group Number for Sounding Reference Signal measurement subframe 3.

```
CALC:EVM:SRS:SGR:NUMB:SUBF3?
> 10
```

:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

Sounding Reference Signal Base Sequence Number Subframe

Function

This command sets the Base Sequence Number for each Sounding Reference Signal measurement subframe.

Command

```
:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

<integer>	Base Sequence Number
Range	0 to 1
Resolution	1
Suffix code	None
Default	0

Details

This is available when Standard is LTE.
When SRS DMRS Parameters is set to Auto ON, this setting is unnecessary because Base Sequence Number is calculated automatically.

Example of Use

To set Base Sequence Number for Sounding Reference Signal measurement subframe 3 to 1.

```
CALC:EVM:SRS:BSEQ:NUMB:SUBF3 1
```

:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

Sounding Reference Signal Base Sequence Number Subframe Query

Function

This command queries the Base Sequence Number for each Sounding Reference Signal measurement subframe.

Query

```
:CALCulate:EVM:SRSignal:BSEQuence:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`		Base Sequence Number
	Range	0 to 1
	Resolution	1

Example of Use

To query Sequence Group Number for Sounding Reference Signal measurement subframe 3.

```
CALC:EVM:SRS:BSEQ:NUMB:SUBF3?
> 1
```

:CALCulate:EVM:SRSignal:CSHift <integer>

Sounding Reference Signal Cyclic Shift Index

Function

This command sets the Cyclic Shift Index for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:CSHift <integer>
```

Parameter

<integer>	Cyclic Shift Index
Range	0 to 7
Resolution	1
Suffix code	None
Default	0

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.

Example of Use

To set Cyclic Shift Index for Sounding Reference Signal measurement value to 5.

```
CALC:EVM:SRS:CSH 5
```

:CALCulate:EVM:SRSignal:CSHift?

Sounding Reference Signal Cyclic Shift Index Query

Function

This command queries the Cyclic Shift Index value for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:CSHift?
```

Response

```
<integer>
```

Parameter

<integer>	Cyclic Shift Index
Range	0 to 7
Resolution	1

Example of Use

To query value of Cyclic Shift Index for Sounding Reference Signal Measurement.

```
CALC:EVM:SRS:CSH?
> 5
```

:CALCulate:EVM:SRSignal:TCOMb <integer>

Sounding Reference Signal Transmission Comb

Function

This command sets the value of Transmission Comb for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:TCOMb <integer>
```

Parameter

<integer>	Transmission Comb
Range	0 to 1
Resolution	1
Suffix code	None
Default	0

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.
The function key is marked ”K_TC”.

Example of Use

To set value of Transmission Comb for Sounding Reference Signal measurement to 1.

```
CALC:EVM:SRS:TCOM 1
```

:CALCulate:EVM:SRSignal:TCOMb?

Sounding Reference Signal Transmission Comb Query

Function

This command queries the value of Transmission Comb for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:TCOMb?
```

Response

```
<integer>
```

Parameter

<integer>	Transmission Comb
Range	0 to 1
Resolution	1

Example of Use

To query value of Transmission Comb for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:TCOM?
> 1
```

:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration <integer>

Sounding Reference Signal Bandwidth Configuration

Function

This command sets the value of Bandwidth Configuration for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration <integer>
```

Parameter

<integer>	Bandwidth Configuration	
Range	0 to 7	
Resolution	1	
Suffix code	None	
Default	2	(Channel Bandwidth 20 MHz)
	2	(Channel Bandwidth 15 MHz)
	2	(Channel Bandwidth 10 MHz)
	3	(Channel Bandwidth 5 MHz)
	5	(Channel Bandwidth 3 MHz)
	7	(Channel Bandwidth 1.4 MHz)

Details

This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.
The function key is marked “C_SRS”.

Example of Use

To set the value of Bandwidth Configuration for Sounding Reference Signal measurement to 1.

```
CALC:EVM:SRS:BAND:CONF 1
```

:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration?

Sounding Reference Signal Bandwidth Configuration Query

Function

This command queries the value of Bandwidth Configuration for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:BANDwidth:CONFiguration?
```

Response

```
<integer>
```

Parameter

`<integer>`		Bandwidth Configuration
	Range	0 to 7
	Resolution	1

Example of Use

To query value of Bandwidth Configuration for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:BAND:CONF?
> 1
```

:CALCulate:EVM:SRSignal:BANDwidth <integer>

Sounding Reference Signal Bandwidth

Function

This command sets the Bandwidth value for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:BANDwidth <integer>
```

Parameter

<integer>	Bandwidth
Range	0 to 3
Resolution	1
Suffix code	None
Default	0

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.
The function key is marked “B_SRS”.

Example of Use

To set value of Bandwidth for Sounding Reference Signal measurement to 1.

```
CALC:EVM:SRS:BAND 1
```

:CALCulate:EVM:SRSignal:BANDwidth?

Sounding Reference Signal Bandwidth Query

Function

This command queries the value of Bandwidth for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:BANDwidth?
```

Response

```
<integer>
```

Parameter

<integer>	Bandwidth
Range	0 to 3
Resolution	1

Example of Use

To query value of Bandwidth for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:BAND?
> 1
```

:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration <integer>

Sounding Reference Signal Subframe Configuration

Function

This command sets the value of Subframe Configuration for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration <integer>
```

Parameter

`<integer>`		Subframe Configuration
	Range	0 to 14
	Resolution	1
	Suffix code	None
	Default	0

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.

Example of Use

To set value of Subframe Configuration for Sounding Reference Signal measurement to 1.

```
CALC:EVM:SRS:SUBF:CONF 1
```

:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration?

Sounding Reference Signal Subframe Query

Function

This command queries the value of Subframe Configuration for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:SUBFrame:CONFiguration?
```

Response

```
<integer>
```

Parameter

`<integer>`		Subframe Configuration
	Range	0 to 14
	Resolution	1

Example of Use

To query value of Subframe Configuration for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:SUBF:CONF?
> 1
```

:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1

Sounding Reference Signal Subframe Assignment

Function

This command sets whether to measure every subframe of Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5
|6|7|8|9 <switch>
```

Parameter

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

Details

This is available when Standard is LTE.
Editing Subframe Configuration performs the setting automatically while SRS DMRS Parameters is set to Auto ON. The setting is available whether SRS DMRS Parameters is set to Auto or Manual.

Example of Use

To set whether to measure Subframe 3 of Sounding Reference Signal measurement.

```
CALC:EVM:SRS:SUBF:ASS3 ON
```

:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5|6|7|8|9?

Sounding Reference Signal Subframe Assignment Query

Function

This command queries whether to measure every subframe of Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:SUBFrame:ASSignment[0]|1|2|3|4|5
|6|7|8|9?
```

Response

<switch>	Measurement On/Off
0	Off
1	On

Example of Use

To query whether to measure Subframe 3 of Sounding Reference Signal measurement.

```
CALC:EVM:SRS:SUBF:ASS3?
> 1
```

:CALCulate:EVM:SRSignal:DSS <integer>

Sounding Reference Signal Auto Calculate Params Delta SS

Function

This command sets the value of Delta SS for Sounding Reference Signal measurement.

Command

```
:CALCulate:EVM:SRSignal:DSS <integer>
```

Parameter

<integer>	Delta SS
Range	0 to 29
Resolution	1
Suffix code	None
Default	0

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.

Example of Use

To set value of nDelta SS for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:DSS 10
```

:CALCulate:EVM:SRSignal:DSS?

Sounding Reference Signal Auto Calculate Params Delta SS Query

Function

This command queries the value of Delta SS for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:DSS?
```

Response

```
<integer>
```

Parameter

<integer>	Delta SS
Range	0 to 29
Resolution	1

Example of Use

To query value of Delta SS for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:DSS?
> 10
```

:CALCulate:EVM:SRSignal:CELLid <integer>

Sounding Reference Signal Auto Calculate Params Cell ID

Function

This command sets the value of Cell ID for Sounding Reference Signal measurement.

Command

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

Parameter

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

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.

Example of Use

To set Cell ID for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:CELL 10
```

:CALCulate:EVM:SRSignal:CELLid?

Sounding Reference Signal Auto Calculate Params Cell ID Query

Function

This command queries the Cell ID for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:CELLid?
```

Response

```
<integer>
```

Parameter

<integer>	Cell ID
Range	0 to 503
Resolution	1

Example of Use

To query Cell ID for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:CELL?
> 6
```

:CALCulate:EVM:SRSignal:SGRoup:HOPPing OFF|ON|0|1

SRS Group Hopping

Function

This command disables/enables Group Hopping for SRS measurement.

Command

```
:CALCulate:EVM:SRSignal:SGRoup:HOPPing <mode>
```

Parameter

<mode>	Group Hopping setting
OFF|0	Disabled
ON|1	Enabled (Default)

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.
When SRS Sequence Hopping is changed to Enabled, this parameter is changed automatically to Disabled.

Example of Use

To enable Group Hopping for SRS measurement.

```
CALC:EVM:SRS:SGR:HOPP ON
```

:CALCulate:EVM:SRSignal:SGRoup:HOPPing?

SRS Group Hopping Query

Function

This command queries the Group Hopping status for SRS measurement.

Query

```
:CALCulate:EVM:SRSignal:SGRoup:HOPPing?
```

Response

```
<mode>
```

Parameter

<mode>	Group Hopping setting
0	Disabled
1	Enabled

Example of Use

To query the Group Hopping status for SRS measurement.

```
CALC:EVM:SRS:SGR:HOPP?
> 1
```

:CALCulate:EVM:SRSignal:BSEQuence:HOPPing OFF|ON|0|1

SRS Sequence Hopping

Function

This command disables/enables Sequence Hopping for SRS measurement.

Command

```
:CALCulate:EVM:SRSignal:BSEQuence:HOPPing <mode>
```

Parameter

<mode>	Sequence Hopping setting
OFF|0	Disabled (Default)
ON|1	Enabled

Details

This is available when Standard is LTE.
This is used for automatic calculation of SRS Parameters when SRS DMRS Parameters is set to Auto ON.
When SRS Group Hopping is changed to Enabled, this parameter is changed automatically to Disabled.

Example of Use

To enable Sequence Hopping for SRS measurement.

```
CALC:EVM:SRS:BSEQ:HOPP ON
```

:CALCulate:EVM:SRSignal:BSEQuence:HOPPing?

SRS Sequence Hopping Query

Function

This command queries the Sequence Hopping status for SRS measurement.

Query

```
:CALCulate:EVM:SRSignal:BSEQuence:HOPPing?
```

Response

```
<mode>
```

Parameter

<mode>	Sequence Hopping setting
0	Disabled
1	Enabled

Example of Use

To query the Sequence Hopping status for SRS measurement.

```
CALC:EVM:SRS:BSEQ:HOPP?
> 1
```

2.3.17 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 2 for the analysis starting subframe number.

```
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 starting frame number.

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

2.3.18 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
```

2.3.19 Modulation Scheme

:CALCulate:EVM:PUSCh:MODulation QPSK|16Qam|64Qam|AUTO

Modulation Analysis PUSCH Modulation Scheme

Function

This command sets the PUSCH Modulation Scheme.

Command

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

Parameter

<mode>	Modulation scheme
QPSK	Sets QPSK modulation scheme for analysis.
16Qam	Sets 16QAM modulation scheme for analysis.
64Qam	Sets 64QAM modulation scheme for analysis.
AUTO	Automatically determines modulation scheme for analysis (default)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the modulation scheme for PUSCH to QPSK.

```
CALC:EVM:PUSC:MOD QPSK
```

:CALCulate:EVM:PUSCh:MODulation?

Modulation Analysis PUSCH Modulation Scheme Query

Function

This command queries the modulation scheme for PUSCH.

Query

```
:CALCulate:EVM:PUSCh:MODulation?
```

Response

```
<mode>
```

Parameter

<mode>	Modulation scheme
QPSK	Sets QPSK modulation scheme for analysis.
16Q	Sets 16QAM modulation scheme for analysis.
64Q	Sets 64QAM modulation scheme for analysis.
AUTO	Automatically determines modulation scheme for analysis

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

This command queries the modulation scheme for PUSCH.

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

2.3.20 PUCCH Format

:CALCulate:EVM:PUCCh:FORMat 1|1A|1B|2|2B|2B|3

Modulation Analysis PUCCH Format

Function

This command sets the PUCCH format for modulation analysis.

Command

```
:CALCulate:EVM:PUCCh:FORMat <mode>
```

Parameter

<mode>	PUCCH format
1	Analyzes as Format1 (default).
1A	Analyzes as Format1a.
1B	Analyzes as Format1b.
2	Analyzes as Format2.
2A	Analyzes as Format2a.
2B	Analyzes as Format2b.
3	Analyzes as Format3. (Only when Standard=LTE-A)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set PDCCH format to Format2.

```
CALC:EVM:PUCC:FORM 2
```

:CALCulate:EVM:PUCCh:FORMat?

Modulation Analysis PUCCH Format Query

Function

This command queries the format of PUCCH.

Query

```
:CALCulate:EVM:PUUCh:FORMat?
```

Response

```
<mode>
```

Parameter

<mode>	PUCCH format
1	Analyzes as Format1.
1A	Analyzes as Format1a.
1B	Analyzes as Format1b.
2	Analyzes as Format2.
2A	Analyzes as Format2a.
2B	Analyzes as Format2b.
3	Analyzes as Format3. (Only when Standard=LTE-A)

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the format of PUCCH.

```
CALC:EVM:PUCC:FORM?
> 2
```

2.3.21 Analysis Offset Time

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

Analysis Offset Time Query

Function

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

Command

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

Parameter

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

Details

This setting is enabled when Capture Time is set to Manual.
Setting range varies with the settings of Capture Time Length, Storage Count, and Analysis Frame Position.

Example of Use

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

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

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

Analysis Frame Position Query

Function

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

Query

```
EVM:CAPTure:TIME:OFFS?
```

Response

```
<time>
```

Parameter

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

Example of Use

To query the offset of the analysis start position.

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

2.3.22 EVM Window Length

:CALCulate:EVM:WLENgth <integer>

EVM Window Length

Function

This command sets the FFT window length in Ts unit.

Command

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

Parameter

<integer> FFT window length

Range	When Target Channel ≠ PRACH		
	0 to 142 Ts		
	When Target Channel = PRACH		
	0 to 3166 Ts	(PRACH Format0)	
	0 to 21022 Ts	(PRACH Format1)	
	0 to 6238 Ts	(PRACH Format2)	
	0 to 21022 Ts	(PRACH Format3)	
Resolution	1 Ts		
Suffix code	None		
Default	When Target Channel ≠ PRACH		
	80 Ts	(Channel Bandwidth 1.4 MHz)	
	96 Ts	(Channel Bandwidth 3 MHz)	
	128 Ts	(Channel Bandwidth 5 MHz)	
	132 Ts	(Channel Bandwidth 10 MHz)	
	136 Ts	(Channel Bandwidth 15 MHz)	
	136 Ts	(Channel Bandwidth 20 MHz)	
	When Target Channel = PRACH		
	3072 Ts	(PRACH Format0)	
	20928 Ts	(PRACH Format1)	
	6144 Ts	(PRACH Format2)	
	20928 Ts	(PRACH Format3)	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set 10 for the FFT window length.

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

:CALCulate:EVM:WLENgth?

EVM Window Length Query

Function

This command queries the FFT window length in Ts unit.

Query

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

Response

```
<integer>
```

Parameter

`<integer>` FFT window length

Range When Target Channel ≠ PRACH
0 to 142 Ts
When Target Channel = PRACH
0 to 3166 Ts (PRACH Format0)
0 to 21022 Ts (PRACH Format1)
0 to 6238 Ts (PRACH Format2)
0 to 21022 Ts (PRACH Format3)

Resolution 1 Ts

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the setting of the FFT window.

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

:CALCulate:EVM:WLENgth:W <integer>

EVM Window Length

Function

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

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

Parameter

`<integer>` FFT window length

Range

When Target Channel ≠ PRACH

0 to 8 W	(Channel Bandwidth 1.4 MHz)
0 to 17 W	(Channel Bandwidth 3 MHz)
0 to 35 W	(Channel Bandwidth 5 MHz)
0 to 71 W	(Channel Bandwidth 10 MHz)
0 to 106 W	(Channel Bandwidth 15 MHz)
0 to 142 W	(Channel Bandwidth 20 MHz)

When Target Channel = PRACH

0 to 3166 W	(PRACH Format0)
0 to 21022 W	(PRACH Format1)
0 to 6238 W	(PRACH Format2)
0 to 21022 W	(PRACH Format3)

Resolution: 1 W

Suffix code: None

Default

When Target Channel ≠ PRACH

5 W	(Channel Bandwidth 1.4 MHz)
12 W	(Channel Bandwidth 3 MHz)
32 W	(Channel Bandwidth 5 MHz)
66 W	(Channel Bandwidth 10 MHz)
102 W	(Channel Bandwidth 15 MHz)
136 W	(Channel Bandwidth 20 MHz)

When Target Channel = PRACH

3072 W	(PRACH Format0)
20928 W	(PRACH Format1)
6144 W	(PRACH Format2)
20928 W	(PRACH Format3)

Details

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

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

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

Example of Use

To set 32 for the FFT window length.

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

:CALCulate:EVM:WLENgth:W?

EVM Window Length Query

Function

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

Query

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

Response

```
<integer>
```

Parameter

`<integer>` FFT window length

Range

When Target Channel ≠ PRACH

0 to 8 W	(Channel Bandwidth 1.4 MHz)
0 to 17 W	(Channel Bandwidth 3 MHz)
0 to 35 W	(Channel Bandwidth 5 MHz)
0 to 71 W	(Channel Bandwidth 10 MHz)
0 to 106 W	(Channel Bandwidth 15 MHz)
0 to 142 W	(Channel Bandwidth 20 MHz)

When Target Channel = PRACH

0 to 3166 W	(PRACH Format0)
0 to 21022 W	(PRACH Format1)
0 to 6238 W	(PRACH Format2)
0 to 21022 W	(PRACH Format3)

Resolution 1 W

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

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

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the EVM window length type.

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

2.3.23 Channel Estimation

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

Detail Setting 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)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the Channel Estimation function to On.

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

:CALCulate:EVM:CHANnel:ESTimation?

Detail Setting 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

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the setting of the Channel Estimation function.

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

2.3.24 Equalization Mode

:CALCulate:EVM:EQUalization 200906|200909|DMRS

Detail Setting Equalization Mode

Function

This command sets the Equalization Table calculation method.

Command

```
:CALCulate:EVM:EQUalization <mode>
```

Parameter

<mode>	Equalization Table calculation method
200906	June 2009 recommendation (3GPP TS36. 521 (2009-06))
200909	September 2009 recommendation (3GPP TS36. 521 (2009-09)) (Default)
DMRS	DMRS

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set Equalization Table calculation method to DMRS.

```
CALC:EVM:EQU DMRS
```

:CALCulate:EVM:FEQualization:TABLe?

Detail Setting Equalization Mode Query

Function

This command queries the Equalization Table calculation method.

Query

```
:CALCulate:EVM:FEQualization:TABLe?
```

Response

```
<mode>
```

Parameter

<mode>	Equalization Table calculation method
200906	June 2009 recommendation (3GPP TS36. 521 (2009-06))
200909	September 2009 recommendation (3GPP TS36. 521 (2009-09))
DMRS	DMRS

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the Equalization Table calculation method.

```
CALC:EVM:EQU?
> DMRS
```

2.3.25 Exclusion Period

:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9 OFF|ON|0|1

Exclusion Period Subframe0-9

Function

This command sets whether to target the burst rising/falling of each Subframe for the measurement.

Command

```
:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9
<switch>
```

Parameter

<switch>	Target the burst rising/falling
OFF|0	Off
ON|1	On (Default)

Details

When Standard is LTE-A, this can be set for each CC individually. To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the burst rising/falling of Subframe2 not to target for the measurement.

```
CALC:EVM:EPER:SUBF2 1
```

:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

Exclusion Period Subframe0-9 Query

Function

This command queries whether to target the burst rising/falling of each Subframe for the measurement.

Query

```
:CALCulate:EVM:EPERiod:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<switch>
```

Parameter

`<switch>`	Target the burst rising/falling
`0`	Off
`1`	On

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query whether the burst rising/falling of Subframe2 is the measurement target.

```
CALC:EVM:EPER:SUBF2?
> 1
```

2.3.26 Leading Exclusion Period

:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time>

Leading Exclusion Period Subframe0-9

Function

This command sets the time length for the burst rising of each Subframe.

Command

```
:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7
|8|9 <time>
```

Parameter

<time>		Time length for the burst rising
	Range	0 to 70 μs
	Resolution	10 ns
	Suffix code	NS, US, MS, S s is used when omitted.
	Default	25 μs

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the burst rising time length of Subframe 2 to 100 ns.

```
CALC:EVM:EPER:LEAD:SUBF2 100NS
```

:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

Leading Exclusion Period Subframe0-9 Query

Function

This command queries the time length for the burst rising of each Subframe.

Query

```
:CALCulate:EVM:EPERiod:LEADing:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<time>
```

Parameter

`<time>`		Time length for the burst rising
	Range	0 to 70 μs
	Resolution	10 ns

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the time length for the burst rising of Subframe2.

```
CALC:EVM:EPER:LEAD:SUBF2?
> 0.00000010
```

2.3.27 Lagging Exclusion Period

:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <time>

Lagging Exclusion Period Subframe0-9

Function

This command sets the time length for the burst falling of each Subframe.

Command

```
:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7
|8|9 <time>
```

Parameter

<time>		Time length for the burst falling
	Range	0 to 70 μs
	Resolution	10 ns
	Suffix code	NS, US, MS, S s is used when omitted.
	Default	25 μs

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the burst falling time length of Subframe 2 to 100 ns.

```
CALC:EVM:EPER:LAGG:SUBF2 100NS
```

:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

Lagging Exclusion Period Subframe0-9 Query

Function

This command queries the time length for the burst falling of each Subframe.

Query

```
:CALCulate:EVM:EPERiod:LAGGing:SUBFrame[0]|1|2|3|4|5|6|7
|8|9?
```

Response

```
<time>
```

Parameter

`<time>`		Time length for the burst falling
	Range	0 to 70 μs
	Resolution	10 ns

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the burst falling time length of Subframe 2.

```
CALC:EVM:EPER:LAGG:SUBF2?
> 0.00000010
```

2.3.28 Channel Bandwidth Selective Filter

[:SENSe]:RADio:CBANdwidth:FILTer OFF|ON|0|1

Channel Bandwidth Selective Filter

Function

This command sets the band filter On and Off.

Command

```
[:SENSe]:RADio:CBANdwidth:FILTer <switch>
```

Parameter

<switch>	Channel Bandwidth Selective Filter On/Off
OFF|0	Off (Default)
ON|1	On

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set band filter to On.

```
RAD:CBAN:FILT ON
```

[:SENSe]:RADio:CBANdwidth:FILTer?

Channel Bandwidth Selective Filter Query

Function

This command queries the band filter setting.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Channel Bandwidth Selective Filter On/Off
0	Off
1	On

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query band filter setting.

```
RAD:CBAN:FILT?
> 1
```

2.3.29 RB Type of In-Band Emission Query

:CALCulate:EVM:WINDow11:RBLock:TYPE?

RB Type of In-Band Emission Query

Function

This command queries the internal parameter RB type setting.

Query

```
:CALCulate:EVM:WINDow11:RBLock:TYPE?
```

Response

```
<status_0>,<status_1>,…,<status_(i-1)>
```

Parameter

<status_(i-1)>		RB type
	Value	Combination of below values. = bit0 + bit1 + bit2
	0	Non-Allocated RB (General In-Band Emission)
	bit0=1	Allocated RB
	bit1=2	Non-Allocated RB (DC In-Band Emission)
	bit2=4	Non-Allocated RB (IQ Image In-Band Emission)
	Range	0 to 6
i		The number of RBs in the Slot.
	Range	1 to The number of RBs in the Slot.

Details

The number of responses varies according to the band setting.

RB type is judged when analyzed. Therefore, the response of all –999.0 is returned when the measurement is not performed yet.
When In-band Emission View is Averaged over all Slots, the response of all –999.0 is returned.
When In-band Emission View is Each Slot and the measurement is in progress, a non-measured subframe returns 0.

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the internal parameter RB type setting.

```
:CALC:EVM:WIND11:RBL:TYPE?
> 0,1,0,0,0,0,0,0,0,0,0,2,0,0,…
```

2.3.30 Delta RB of In-Band Emission Query

:CALCulate:EVM:WINDow11:RBLock:DELTa?

Delta RB of In-Band Emission Query

Function

This command queries the internal parameter ΔRB value.

Query

```
:CALCulate:EVM:WINDow11:RBLock:DELTa?
```

Response

```
<value_0>,<value_1>,…,<value_(i-1)>
```

Parameter

<value(i-1)>		ΔRB Value
	Value	Returns ΔRB of each RB (distance from the allocated RB defined in 3GPP TS 36.521-1).
	Resolution	0.00001
i		The number of RBs in the Slot.
	Range	1 to The number of RBs in the Slot.

Details

The number of responses varies according to the band setting.
ΔRB is judged when analyzed. Therefore, the response of all –999.0 is returned when the measurement is not performed yet.
The response of *** is returned when the specified Subframe is OFF in Subframe Assignment.
When In-band Emission View is Averaged over all Slots, the response of all *** is returned.

When the measurement range is over multiple CCs in LTE-Advanced measurement, the measured value is likely to be fractional. Thus, the response is returned as an actual number with five digits after decimal point, which is the same resolution as constellation.

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the internal parameter ΔRB value.

```
:CALC:EVM:WIND11:RBL:DELT?
> -1.00000,+0.00000,+1.00000,+2.00000,+3.00000,…
```

2.3.31 RB Setting

:CALCulate:EVM:RBLock:FIRSt <integer>

First RB Number

Function

This command sets the header for the Include Channel send resource block (First RB). When it is PRACH, the value of PRACH Frequency Offset is set.
For SRS, this command is available only when DMRS Parameters is Manual.

Command

```
:CALCulate:EVM:RBLock:FIRSt <integer>
```

Parameter

PUSCH/PUCCH/SRS

`<integer>` First Resource block number

Range

PUSCH/PUCCH

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)

SRS

0 to (100–Number of RBs) (Channel Bandwidth 20 MHz)
0 to (75–Number of RBs) (Channel Bandwidth 15 MHz)
0 to (50–Number of RBs) (Channel Bandwidth 10 MHz)
0 to (25–Number of RBs) (Channel Bandwidth 5 MHz)
0 to (15–Number of RBs) (Channel Bandwidth 3 MHz)
0 to (6–Number of RBs) (Channel Bandwidth 1.4 MHz)

Resolution 1
Suffix code None
Default 0

PRACH

`<integer>` PRACH Frequency Offset

Range
0 to 94 (Channel Bandwidth 20 MHz)
0 to 69 (Channel Bandwidth 15 MHz)
0 to 44 (Channel Bandwidth 10 MHz)

	0 to 19	(Channel Bandwidth 5 MHz)
	0 to 9	(Channel Bandwidth 3 MHz)
	0	(Channel Bandwidth 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	0	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set header for send resource block to 10.

```
CALC:EVM:RBL:FIRS 10
```

:CALCulate:EVM:RBLock:FIRSt?

First RB Number Query

Function

This command queries the value of the header for the Include Channel send resource block (First RB). When it is PRACH, the value of PRACH Frequency Offset is read.

Query

```
:CALCulate:EVM:RBLock:FIRSt?
```

Response

```
<integer>
```

Parameter

PUSCH/PUCCH/SRS

`<integer>` First Resource block number

Range

PUSCH/PUCCH

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)

SRS

0 to (100–Number of RBs)	(Channel Bandwidth 20 MHz)
0 to (75–Number of RBs)	(Channel Bandwidth 15 MHz)
0 to (50–Number of RBs)	(Channel Bandwidth 10 MHz)
0 to (25–Number of RBs)	(Channel Bandwidth 5 MHz)
0 to (15–Number of RBs)	(Channel Bandwidth 3 MHz)
0 to (6–Number of RBs)	(Channel Bandwidth 1.4 MHz)

Resolution 1

PRACH

`<integer>` PRACH Frequency Offset

Range

0 to 94	(Channel Bandwidth 20 MHz)
0 to 69	(Channel Bandwidth 15 MHz)
0 to 44	(Channel Bandwidth 10 MHz)
0 to 19	(Channel Bandwidth 5 MHz)
0 to 9	(Channel Bandwidth 3 MHz)
0	(Channel Bandwidth 1.4 MHz)

Resolution 1

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query number of header for send resource block.

```
CALC:EVM:RBL:FIRS?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:RBLock:NUMBer <integer>

Number of RBs

Function

This command sets the Include Channel send resource block number (Number of RBs).
For SRS, this command is available only when DMRS Parameters is Manual.

Command

```
:CALCulate:EVM:RBLock:NUMBer <integer>
```

Parameter

`<integer>` Number of RBs

Range	PUSCH		
		1 to (100–First RB)	(Channel Bandwidth 20 MHz)
		1 to (75–First RB)	(Channel Bandwidth 15 MHz)
		1 to (50–First RB)	(Channel Bandwidth 10 MHz)
		1 to (25–First RB)	(Channel Bandwidth 5 MHz)
		1 to (15–First RB)	(Channel Bandwidth 3 MHz)
		1 to (6–First RB)	(Channel Bandwidth 1.4 MHz)
	SRS		
		4	(Channel Bandwidth 1.4 MHz)
		4 to 12	(Channel Bandwidth 3 MHz)
		4 to 24	(Channel Bandwidth 5 MHz)
		4 to 48	(Channel Bandwidth 10 MHz)
		4 to 72	(Channel Bandwidth 15 MHz)
		4 to 96	(Channel Bandwidth 20 MHz)
Resolution		1	
Suffix code		None	
Default	PUSCH		
		100	(Channel Bandwidth 20 MHz)
		75	(Channel Bandwidth 15 MHz)
		50	(Channel Bandwidth 10 MHz)
		25	(Channel Bandwidth 5 MHz)
		15	(Channel Bandwidth 3 MHz)
		6	(Channel Bandwidth 1.4 MHz)
	SRS		
		96	(Channel Bandwidth 20 MHz)

72	(Channel Bandwidth 15 MHz)
48	(Channel Bandwidth 10 MHz)
24	(Channel Bandwidth 5 MHz)
12	(Channel Bandwidth 3 MHz)
4	(Channel Bandwidth 1.4 MHz)

Details

When either PUCCH or PRACH is selected as the Target Channel, this command is disabled.
When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set send resource block number to 10.

```
CALC:EVM:RBL:NUMB 10
```

:CALCulate:EVM:RBLock:NUMBer?

Number of RBs Query

Function

This command queries the Include Channel send resource block number (Number of RBs).

Query

```
:CALCulate:EVM:RBLock:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>` Number of RBs

Range

PUSCH

1 to (100–First RB) (Channel Bandwidth 20 MHz)
1 to (75–First RB) (Channel Bandwidth 15 MHz)
1 to (50–First RB) (Channel Bandwidth 10 MHz)
1 to (25–First RB) (Channel Bandwidth 5 MHz)
1 to (15–First RB) (Channel Bandwidth 3 MHz)
1 to (6–First RB) (Channel Bandwidth 1.4 MHz)

SRS

4 (Channel Bandwidth 1.4 MHz)
4 to 12 (Channel Bandwidth 3 MHz)
4 to 24 (Channel Bandwidth 5 MHz)
4 to 48 (Channel Bandwidth 10 MHz)
4 to 72 (Channel Bandwidth 15 MHz)
4 to 96 (Channel Bandwidth 20 MHz)

Resolution 1

Details

When PUCCH or PRACH is selected as the Target Channel, "***" is returned as the response.
When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query send resource block number.

```
CALC:EVM:RBL:NUMB?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt <integer>

PUSCH First RB all Subframe

Function

This command sets the First RB for all Subframes of PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt <integer>
```

Parameter

<integer>	First RB for PUSCH measurement.	
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	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the First RB to 10 for all Subframes of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:FIRS 10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt?

PUSCH First RB all Subframe Query

Function

This command queries the First RB for all Subframes of PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt?
```

Response

```
<integer>
```

Parameter

`<integer>`	First RB for PUSCH measurement.	
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	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the First RB for all Subframes of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:FIRS?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUSCH First RB Subframe0-9

Function

This command sets the First RB for every Subframe of PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

`<integer>`	First RB for PUSCH measurement.	
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	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the First RB to 10 for Subframe 3 of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:FIRS:SUBF3 10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUSCH First RB Subframe0-9 Query

Function

This command queries the First RB for every Subframe of PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`	First RB for PUSCH measurement.	
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	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the First RB for Subframe 3 of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:FIRS:SUBF3?
> 10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer <integer>

PUSCH Number of RBs all Subframe

Function

This command sets the number of resource blocks (Number of RBs) for all Subframes of PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer <integer>
```

Parameter

`<integer>`	The number of resource blocks	
Range	1 to (100 – First RB Number)	(Channel Bandwidth: 20 MHz)
	1 to (75 – First RB Number)	(Channel Bandwidth: 15 MHz)
	1 to (50 – First RB Number)	(Channel Bandwidth: 10 MHz)
	1 to (25 – First RB Number)	(Channel Bandwidth: 5 MHz)
	1 to (15 – First RB Number)	(Channel Bandwidth: 3 MHz)
	1 to (6 – First RB Number)	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	100	(Channel Bandwidth: 20 MHz)
	75	(Channel Bandwidth: 15 MHz)
	50	(Channel Bandwidth: 10 MHz)
	25	(Channel Bandwidth: 5 MHz)
	15	(Channel Bandwidth: 3 MHz)
	6	(Channel Bandwidth: 1.4 MHz)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the number of resource blocks to 10 for all Subframes of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:NUMB 10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer?

PUSCH Number of RBs all Subframe Query

Function

This command queries the number of resource blocks (Number of RBs) for all Subframes of PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`		The number of resource blocks
	Range	1 to (100 – First RB Number) (Channel Bandwidth: 20 MHz) 1 to (75 – First RB Number) (Channel Bandwidth: 15 MHz) 1 to (50 – First RB Number) (Channel Bandwidth: 10 MHz) 1 to (25 – First RB Number) (Channel Bandwidth:s 5 MHz) 1 to (15 – First RB Number) (Channel Bandwidth: 3 MHz) 1 to (6 – First RB Number) (Channel Bandwidth: 1.4 MHz)
	Resolution	1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the number of resource blocks for all Subframes of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:NUMB?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUSCH Number of RBs Subframe0-9

Function

This command sets the number of resource blocks (Number of RBs) for every Subframe of PUSCH measurement.

Command

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

`<integer>`	The number of resource blocks	
Range	1 to (100–First RB Number)	(Channel Bandwidth: 20 MHz)
	1 to (75–First RB Number)	(Channel Bandwidth: 15 MHz)
	1 to (50–First RB Number)	(Channel Bandwidth: 10 MHz)
	1 to (25–First RB Number)	(Channel Bandwidth: 5 MHz)
	1 to (15–First RB Number)	(Channel Bandwidth: 3 MHz)
	1 to (6–First RB Number)	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	100	(Channel Bandwidth: 20 MHz)
	75	(Channel Bandwidth: 15 MHz)
	50	(Channel Bandwidth: 10 MHz)
	25	(Channel Bandwidth: 5 MHz)
	15	(Channel Bandwidth: 3 MHz)
	6	(Channel Bandwidth: 1.4 MHz)

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the number of resource blocks to 10 for Subframe 3 of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:NUMB:SUBF3 10
```

:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUSCH Number of RBs Subframe0-9 Query

Function

This command queries the number of resource blocks (Number of RBs) for every Subframe of PUSCH measurement.

Query

```
:CALCulate:EVM:PUSCh:RSIGnal:RBLock:NUMBer:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`		The number of resource blocks
Range		1 to (100–First RB Number) (Channel Bandwidth: 20 MHz) 1 to (75–First RB Number) (Channel Bandwidth: 15 MHz) 1 to (50–First RB Number) (Channel Bandwidth: 10 MHz) 1 to (25–First RB Number) (Channel Bandwidth: 5 MHz) 1 to (15–First RB Number) (Channel Bandwidth: 3 MHz) 1 to (6–First RB Number) (Channel Bandwidth: 1.4 MHz)
Resolution		1

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the number of resource blocks for Subframe 3 of PUSCH measurement.

```
CALC:EVM:PUSC:RSIG:RBL:NUMB:SUBF3?
> 10
```

:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt <integer>

PUCCH First RB all Subframe

Function

This command sets the first number of resource block (First RB) of all subframes of PUCCH measurement collectively.
This is available only when PUCCH DMARS Paremeters is Manual.

Command

```
:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt <integer>
```

Parameter

<integer>	First RB for PUSCH measurement	
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	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the First RB to 10 for PUCCH measurement.

```
CALC:EVM:PUCC:RSIG:RBL:FIRS 10
```

:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt?

PUCCH First RB all Subframe Query

Function

This command queries the first number of resource block (First RB) of all subframes of PUCCH measurement collectively.

Query

```
:CALCulate:EVM:PUCCh:RSIGnal:RBLock:FIRSt?
```

Response

```
<integer>
```

Parameter

`<integer>`	First RB for PUCCH measurement	
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	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the First RB of all subframes of PUCCH measurement collectively.

```
CALC:EVM:PUCC:RSIG:RBL:FIRS?
> 10,10,10,10,10,10,10,10,10,10
```

:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>

PUCCH First RB Subframe0-9

Function

This command sets the First RB for every Subframe of PUCCH measurement.
This is available only when PUCCH DMRS Parameters is Manual.

Command

```
:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9 <integer>
```

Parameter

`<integer>`	First RB for PUCCH measurement.	
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	

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

Example of Use

To set the First RB to 10 for Subframe 3 of PUCCH measurement.

```
CALC:EVM:PUCC:RBL:FIRS:SUBF3 10
```

:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?

PUCCH First RB Subframe0-9 Query

Function

This command queries the First RB for every Subframe of PUCCH measurement.

Query

```
:CALCulate:EVM:PUCCh:RBLock:FIRSt:SUBFrame[0]|1|2|3|4|5|6|7|8|9?
```

Response

```
<integer>
```

Parameter

`<integer>`	First RB for PUCCH measurement.	
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	

Details

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the First RB for Subframe 3 of PUCCH measurement.

```
CALC:EVM:PUCC:RBL:FIRS:SUBF3?
> 10
```

:CALCulate:EVM:PRACh:FREQuency:OFFSet <integer>

PRACH Frequency Offset

Function

This command sets the Frequency Offset for PRACH measurement.

Command

```
:CALCulate:EVM:PRACh:FREQuency:OFFSet <integer>
```

Parameter

`<integer>`	Frequency Offset for PRACH measurement.	
Range	0 to 94	(Channel Bandwidth: 20 MHz)
	0 to 69	(Channel Bandwidth: 15 MHz)
	0 to 44	(Channel Bandwidth: 10 MHz)
	0 to 19	(Channel Bandwidth: 5 MHz)
	0 to 9	(Channel Bandwidth: 3 MHz)
	0	(Channel Bandwidth: 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	0	

Details

This is available when Standard is LTE.

Example of Use

To set the Frequency Offset for PRACH to 1.

```
CALC:EVM:PRAC:FREQ:OFFS 1
```

:CALCulate:EVM:PRACh:FREQuency:OFFSet?

PRACH Frequency Offset Query

Function

This command queries the Frequency Offset for PRACH measurement.

Query

```
:CALCulate:EVM:PRACh:FREQuency:OFFSet?
```

Response

```
<integer>
```

Parameter

`<integer>`	Frequency Offset for PRACH measurement.	
Range	0 to 94	(Channel Bandwidth 20 MHz)
	0 to 69	(Channel Bandwidth 15 MHz)
	0 to 44	(Channel Bandwidth 10 MHz)
	0 to 19	(Channel Bandwidth 5 MHz)
	0 to 9	(Channel Bandwidth 3 MHz)
	0	(Channel Bandwidth 1.4 MHz)
Resolution	1	

Example of Use

To query the Frequency Offset for PRACH measurement.

```
CALC:EVM:PRAC:FREQ:OFFS?
> 1
```

:CALCulate:EVM:SRSignal:RBLock:NUMBer <integer>

Sounding Reference Signal Number of RBs

Function

This command sets the number of Resource Blocks (Number of RBs) for Sounding Reference Signal measurement.
This command is available only when DMRS Parameters is Manual.

Command

```
:CALCulate:EVM:SRSignal:RBLock:NUMBer <integer>
```

Parameter

<integer>	Number of RBs	
Range	4	(Channel Bandwidth 1.4 MHz)
	4 to (15–First RB)	(Channel Bandwidth 3 MHz) up-to 12
	4 to (25–First RB)	(Channel Bandwidth 5 MHz) up-to 24
	4 to (50–First RB)	(Channel Bandwidth 10 MHz) up-to 48
	4 to (75–First RB)	(Channel Bandwidth 15 MHz) up-to 72
	4 to (100–First RB)	(Channel Bandwidth 20 MHz) up-to 96
Resolution	1	
Suffix code	None	
Default	Same as maximum.	

Details

This is available only when Standard is LTE.

Example of Use

To set value of Number of RBs for Sounding Reference Signal measurement to 4.

```
CALC:EVM:SRS:RBL:NUMB 4
```

:CALCulate:EVM:SRSignal:RBLock:NUMBer?

Sounding Reference Signal Number of RBs Query

Function

This command queries the number of Resouce Blocks (Number of RBs) for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:RBLock:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`		Number of RBs	
	Range	4	(Channel Bandwidth 1.4 MHz)
		4 to (15–First RB) up-to 12	(Channel Bandwidth 3 MHz)
		4 to (25–First RB) up-to 24	(Channel Bandwidth 5 MHz)
		4 to (50–First RB) up-to 48	(Channel Bandwidth 10 MHz)
		4 to (75–First RB) up-to 72	(Channel Bandwidth 15 MHz)
		4 to (100–First RB) up-to 96	(Channel Bandwidth 20 MHz)
	Resolution	1	

Example of Use

To query Number of RBs for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:RBL:NUMB?
> 4
```

:CALCulate:EVM:SRSignal:RBLock:FIRSt <integer>

Sounding Reference Signal First RB

Function

This command sets the first Resource Block number (First RB) for Sounding Reference Signal measurement. This command is available only when DMRS Parameters is Manual.

Command

```
:CALCulate:EVM:SRSignal:RBLock:FIRSt <integer>
```

Parameter

<integer>	First RB	
Range	0 to 96	(Channel Bandwidth 20 MHz)
	0 to 71	(Channel Bandwidth 15 MHz)
	0 to 46	(Channel Bandwidth 10 MHz)
	0 to 21	(Channel Bandwidth 5 MHz)
	0 to 11	(Channel Bandwidth 3 MHz)
	0 to 2	(Channel Bandwidth 1.4 MHz)
Resolution	1	
Suffix code	None	
Default	2	

Details

This is available only when Standard is LTE.

Example of Use

To set value of First RB for Sounding Reference Signal measurement to 1.

```
CALC:EVM:SRS:RBL:FIRS 1
```

:CALCulate:EVM:SRSignal:RBLock:FIRSt?

Sounding Reference Signal First RB Query

Function

This command queries the value of First RB for Sounding Reference Signal measurement.

Query

```
:CALCulate:EVM:SRSignal:RBLock:First?
```

Response

```
<integer>
```

Parameter

`<integer>`	First RB	
Range	0 to 96	(Channel Bandwidth 20 MHz)
	0 to 71	(Channel Bandwidth 15 MHz)
	0 to 46	(Channel Bandwidth 10 MHz)
	0 to 21	(Channel Bandwidth 5 MHz)
	0 to 11	(Channel Bandwidth 3 MHz)
	0 to 2	(Channel Bandwidth 1.4 MHz)
Resolution	1	

Example of Use

To query value of First RB for Sounding Reference Signal measurement.

```
CALC:EVM:SRS:RBL:FIRS?
> 1
```

2.4 Utility Function

Table 2.4-1 lists the device messages for the utility function of the measurement target.

Table 2.4-1 Device Messages for Utility Function

Function	Device Messages
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?`

2.4.1 Erase Warm Up Message

:DISPlay:ANNotation:WUP:ERASe

Erase Warm Up Message

Function

This command erases the warm up message displayed immediately after startup.

Command

```
:DISPlay:ANNotation:WUP:ERASe
```

Example of Use

To erase the warm up message

```
DISP:ANN:WUP:ERAS
```

2.4.2 Display Title

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

Display Title

Function

This command turns the title 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 whether the title display is enabled/disabled.

Query

```
:DISPlay:ANNotation:TITLe[:STATe]?
```

Response

```
<switch>
```

Parameter

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

Example of Use

To query the title display On/Off state.

```
DISP:ANN:TITL?
> 1
```

2.4.3 Title Entry

:DISPlay:ANNotation:TITLe:DATA <string>

Title Entry

Function

This command sets the title character string.

Command

```
:DISPlay:ANNotation:TITLe:DATA <string>
```

Parameter

<string>	Title characters Character string within 32 characters enclosed by double quotes (" ") or single quotes (' ')

Example of Use

To set the 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>	Title characters Character string within 32 characters enclosed by double quotes (" ") or single quotes (' ')

Example of Use

To query the title character string.

```
DISP:ANN:TITL:DATA?
> TEST
```

2.5 Common Measurement Function

Table 2.5-1 lists the device messages for performing operations common to the measurement functions.

Table 2.5-1 Device Messages for Operations Common to Measurement Functions

Function	Device Messages
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 Query	: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/Manual	[:SENSe]:SWEep:TIME:AUTO ON|OFF|1|0
	[:SENSe]:SWEep:TIME:AUTO?
Capture Time Length	[: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|2]|EXT2|IMMediate|SG
	:TRIGger[:SEQuence]:SOURce?
Trigger Slope	:TRIGger[:SEQuence]:SLOPe POSitive|NEGative
	:TRIGger[:SEQuence]:SLOPe?
Trigger Delay	:TRIGger[:SEQuence]:DELay <time>
	:TRIGger[:SEQuence]:DELay?
Video Trigger Level	:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <power>
	:TRIGger[:SEQuence]:VIDeo:LEVel[LOGarithmic]?

Note:

The trigger settings are separately retained for each application, and are commonly applied to the measurement functions within the application.

2.5.1 Measurement and Control

:INITiate:CONTinuous OFF|ON|0|1

Continuous Measurement

Function

This command sets continuous or single measurement mode.

Command

```
:INITiate:CONTinuous <switch>
```

Parameter

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

Details

When ON is set, continuous measurement starts. When set to Off, the Single measurement mode is set but measurement does not start at that time.

Example of Use

To make a 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 mode
`1`	Continuous measurement mode

Example of Use

To query the measurement mode.

```
INIT:CONT?
> 1
```

:INITiate:MODE:CONTinuous

Continuous Measurement

Function

This command starts continuous measurement.

Command

```
:INITiate:MODE:CONTinuous
```

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
```

Example of Use

To start a single measurement.

```
INIT:MODE:SING
```

:INITiate[:IMMediate]

Initiate

Function

Measurement starts with the current measurement mode.

Command

```
:INITiate[:IMMediate]
```

Example of Use

To start the measurement in the current measurement mode.

```
INIT
```

:INITiate:CALCulate

Calculate

Function

This command executes analysis without capturing waveforms. This command is used when executing re-analysis for the same captured waveform by changing parameters.

Command

```
:INITiate:CALCulate
```

Details

If a waveform is not captured or if a parameter that requires waveform recapturing is changed, the waveform is captured before analysis is executed.
Another command or query can be accepted even if this function is being executed. Note, however, if a command that requires waveform recapturing or trace recalculation is received, this function is stopped and the received command is executed.
To query the measurement results after executing this command, use the `*WAI` command to control synchronization.
Note that synchronization control during the Continuous mode is not supported.

Example of Use

To start the measurement in the current measurement mode.

```
INIT:CALC
```

:CONFigure?

Configure Query

Function

This command queries the name of the current measurement mode.

Query

```
:CONFigure?
```

Response

```
<mode>
```

Parameter

<mode>	Measurement function
EVM	Modulation Analysis Measurement
PVT	Power vs Time Measurement
ACP	ACP Measurement
CHP	Channel Power Measurement
OBW	OBW Measurement
SEM	SEM Measurement
Default	EVM

Example of Use

To query the current measurement mode.

```
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 with any character string enclosed by double quotes (" ") or single quotes (' ')
`<device>`	Name of the drive to be saved. Drive name: D, E

Details

This function is available when the waveform is captured under the following conditions:

・A single measurement is completed.

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

\Anritsu Corporation\Signal Analyzer\User Data\Digitized Data\3GLTE Uplink

Up to 1000 files can be saved in a folder.

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 the saving of a waveform data file.

Command

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

Example of Use

To cancel digitizing.

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

:MMEMory:STORe:IQData:RATE <freq>

Output Rate for Save Captured Data

Function

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

Command

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

Parameter

`<freq>`	Output rate	
Range	MS269xA, MS2830A	
	20 to 50 MHz	(Span 31.25 MHz)
	50 to 100 MHz	(Span 62.5 MHz)
	100 to 200 MHz	(Span 125 MHz)
	MS2850A	
	20 to 50 MHz	(Span 31.25 MHz)
	50 to 81.25 MHz	(Span 62.5 MHz)
	81.25 to 162.5 MHz	(Span 125 MHz)
Resolution	100 Hz	(Span 31.25 MHz)
	1 kHz	(Span 62.5 MHz or 125 MHz)
Default	MS269xA, MS2830A	
	50 MHz	(Span 31.25 MHz)
	100 MHz	(Span 62.5 MHz)
	200 MHz	(Span 125 MHz)
	MS2850A	
	50 MHz	(Span 31.25 MHz)
	81.25 MHz	(Span 62.5 MHz)
	162.5 MHz	(Span 125 MHz)
Suffix code	`HZ, KHZ, KZ, MHZ, MZ, GHZ, GZ`	
	Hz is used when omitted.	

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 Query

Function

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

Query

```
:MMEMory:STORe:IQData:RATE?
```

Response

```
<freq>
```

Parameter

`<freq>`	Output rate		
Range	MS269xA, MS2830A		
	20000000 to 50000000		(Span 31.25 MHz)
	50000000 to 100000000		(Span 62.5 MHz)
	100000000 to 200000000		(Span 125 MHz)
	MS2850A		
	20000000 to 50000000		(Span 31.25 MHz)
	50000000 to 81250000		(Span 62.5 MHz)
	81250000 to 162500000		(Span 125 MHz)
Resolution	100 Hz	(Span 31.25 MHz)	
	1 kHz	(Span 62.5 MHz or 125 MHz)	

Example of Use

To query the output rate.

```
MMEM:STOR:IQD:RATE?
> 30000000
```

[:SENSe]:SWEep:TIME:AUTO ON|OFF|1|0

Capture Time Auto/Manual

Function

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

Command

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

Parameter

<switch>	Automatic/Manual setting of Capture Time
ON|1	Automatic setting (Default)
OFF|0	Manual setting

Details

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

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 automatically or manually specified.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Automatic/Manual setting of Capture Time
1	Automatic setting
0	Manual setting

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 of the waveform.

Command

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

Parameter

`<integer>` Capture time (in frame units)

Range	When Measurement is Power vs Time, and Target Channel is PUSCH/PUCCH/SRS. 3 to 200 (Span 31.25 MHz) 3 to 100 (Span 62.5 MHz) 3 to 50 (Span 125 MHz) Other than above. 1 to 200 (Span 31.25 MHz) 1 to 100 (Span 62.5 MHz) 1 to 50 (Span 125 MHz)
Resolution	1
Default	1

Details

The automatic mode is switched to the manual mode when the capture time is set.
This command is not available when the Replay function is executed.

Example of Use

To set 200 frames for the capture time.

```
SWE:TIME 200
```

[:SENSe]:SWEep:TIME?

Capture Time Length Query

Function

This command queries the capture time of the waveform.

Query

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

Response

```
<integer>
```

Parameter

`<integer>`		Capture time (in frame units)
Range		When Measurement is Power vs Time, and Target Channel is PUSCH/PUCCH/SRS.
	3 to 200	(Span 31.25 MHz)
	3 to 100	(Span 62.5 MHz)
	3 to 50	(Span 125 MHz)
	Other than above.	
	1 to 200	(Span 31.25 MHz)
	1 to 100	(Span 62.5 MHz)
	1 to 50	(Span 125 MHz)
Resolution		1

Example of Use

To query the capture time of the waveform.

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

2.5.2 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 state 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 to 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 state On/Off
`0`	Off
`1`	On

Example of Use

To query the trigger wait state setting.

```
TRIG?
> 1
```

2.5.3 Trigger Source

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

Trigger Source

Function

This command selects the trigger signal source.

Command

```
:TRIGger[:SEQuence]:SOURce <mode>
```

Parameter

<mode>	Trigger signal source
EXTernal[1]	External input (External)
EXTernal2|EXT2	External input 2 (External 2)
IMMediate	Free run (Default)
SG	SG Marker (SG Marker)
VIDeo	Video Trigger

Details

Video Trigger can be selected only when PRACH is set to Include as the Target Channel.
SG marker can be selected only when the Option 020 is installed.
This command is not available when the Replay function is executed.
External input 2 (External 2) is selectable only for MS2850A.

Example of Use

To set the trigger signal source to External input.

```
TRIG:SOUR EXT
```

:TRIGger[:SEQuence]:SOURce?

Trigger Source Query

Function

This command queries the trigger signal source.

Query

```
:TRIGger[:SEQuence]:SOURce?
```

Response

```
<mode>
```

Parameter

`<mode>`	Trigger signal source
`EXT`	External input (External)
`EXT2`	External input 2 (External 2)
`IMM`	Free run
`SG`	SG Marker (SG Marker)
`VID`	Video Trigger

Details

SG marker is returned only when Option 020 is installed.

Example of Use

To query the trigger signal source.

```
TRIG:SOUR?
> EXT
```

2.5.4 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	Detects a trigger at the rising edge (Default).
NEGative	Detects a trigger 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	Detects a trigger at the rising edge.
NEG	Detects a trigger at the falling edge.

Example of Use

To query the trigger detection mode.

```
TRIG:SLOP?
> POS
```

2.5.5 Trigger Delay

:TRIGger[:SEQuence]:DELay <time>

Trigger Delay

Function

This command sets the delay time from generation of a trigger to start of the capture operation.

Command

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

Parameter

`<time>`	Delay time	
Range	–2 to +2 s	(Span 31.25 MHz)
	–1 to +1 s	(Span 62.5 MHz)
	–0.5 to +0.5 s	(Span 125 MHz)
Resolution	Refer to *MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual Signal Analyzer Function Operation* or *MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Signal Analyzer Function Operation*.	
Suffix code	`NS, US, MS, S`	
	s is used when the suffix code is 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 delay time from generation of a trigger to start of the capture operation.

Query

```
:TRIGger[:SEQuence]:DELay?
```

Response

```
<time>
```

Parameter

`<time>`	Delay time	
Range	–2 to +2 s	(Span 31.25 MHz)
	–1 to +1 s	(Span 62.5 MHz)
	–0.5 to +0.5 s	(Span 125 MHz)
Resolution	Refer to *MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual Signal Analyzer Function Operation* or *MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Signal Analyzer Function Operation*.	
Suffix code	None	
	Value is returned in s units.	

Example of Use

To query the delay time.

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

2.5.6 Video Trigger Level

:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <power>

Video Trigger Level

Function

This command sets the Video trigger detection level.

Command

```
:TRIGger[:SEQuence]:VIDeo:LEVel[:LOGarithmic] <power>
```

Parameter

<power>		Video trigger detection level
	Range	–150 to +50 dBm
	Resolution	0.01 dBm
	Suffix code	DBM dBm when omitted
	Default	–40 dBm

Details

This command is enabled when PRACH is Include as the Target Channel.
This command is not available when the Replay function is executed.

Example of Use

To set Video trigger level to 5 dBm.

```
TRIG:VID:LEV 5
```

:TRIGger[:SEQuence]:VIDeo:LEVel[LOGarithmic]?

Video Trigger Level Query

Function

This command queries the Video trigger detection level.

Query

```
:TRIGger[:SEQuence]:VIDeo:LEVel[LOGarithmic]?
```

Response

```
<power>
```

Parameter

<power>		Video trigger detection level
	Range	–150 to +50 dBm
	Resolution	0.01 dBm

Example of Use

To query Video trigger detection level.

```
TRIG:VID:LEV?
> 5
```

2.6 ACP/Channel Power/OBW/SEM Measurement Functions

Table 2.6-1 lists device messages for fetching the ACP/Channel Power/OBW/SEM measurement functions. The applications to be used (Signal Analyzer or Spectrum Analyzer) must be loaded in advance.

Refer to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control)* or *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Spectrum Analyzer Function Remote Control)* for commands/queries to be used for control after these measurement functions have been fetched.

Table 2.6-1 Device Messages for ACP, Channel Power, OBW, and SEM Measurement Functions

Function	Device Messages
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]?`

Note:

`FETCh:<measure>`, `INITiate:<measure>`, `READ:<measure>`, and `MEASure:<measure>` cannot used when the MX269021A is selected, except for Modulation measurement. The commands/queries can be used when Signal Analyzer or Spectrum Analyzer is selected after executing `CONFigure:<measure>`.

With this application, the ACP measurement function of the Signal 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.
The measurement mode can be set by `[:SENSe]:ACPower:INSTrument[:SELect] FFT|SWEPt`, if `FFT` or `SWEPt` is omitted.

Command

```
:CONFigure[:FFT|SWEPt]:ACP
```

Details

No measurement is made.

This function is only enabled when Channel Bandwidth is set to 1.4, 3, and 5 MHz.

Example of Use

To select the ACP measurement function of 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

No measurement is made.

Example of Use

To select the Channel Power measurement function of Spectrum Analyzer.

```
CONF:SWEP:CHP
```

:CONFigure[:FFT|SWEPt]:OBWidth

OBW

Function

This command selects the OBW measurement function.
The measurement mode can be set by `[:SENSe]:OBWidth:INSTrument[:SELect] FFT|SWEPt`, if `FFT` or `SWEPt` is omitted.

Command

```
:CONFigure[:FFT|SWEPt]:OBWidth
```

Details

No measurement is made.

Example of Use

To select the OBW measurement function of Spectrum Analyzer.

```
CONF:SWEP:OBW
```

:CONFigure[:SWEPt]:SEMask

SEM

Function

This command selects the SEM measurement function.

Command

```
:CONFigure[:SWEPt]:SEMask
```

Details

No measurement is made.
The SEM measurement function is enabled only for the Spectrum Analyzer.

Example of Use

To select the SEM measurement function of Spectrum Analyzer.

```
CONF: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

No measurement is made.

Example of Use

To use the Signal Analyzer function when executing the ACP measurement function.

```
ACP:INST FFT
```

[:SENSe]:ACPower:INSTrument[:SELect]?

Measurement Method for ACP Query

Function

:This command queries the measurement mode to be applied when `:CONFigure:ACP` is executed.

Query

```
[:SENSe]:ACPower:INSTrument[:SELect]?
```

Response

```
<mode>
```

Parameter

`<mode>`	Measurement mode
`FFT`	Signal Analyzer function
`SWEP`	Spectrum analyzer function

Example of Use

To query the measurement mode to be applied when executing the ACP measurement function.

```
ACP:INST?
> FFT
```

[:SENSe]:CHPower:INSTrument[:SELect] FFT|SWEPt

Measurement Method for Channel Power

Function

:This command sets the measurement mode to be applied when :CONFigure:ACP is executed.

Command

```
[:SENSe]:CHPower:INSTrument[:SELect] <mode>
```

Parameter

<mode>	Measurement mode
FFT	Signal Analyzer function
SWEPt	Spectrum Analyzer function (Default)

Details

No measurement is made.

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.

Query

```
[: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

No measurement is made.

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.

Query

```
[:SENSe]:OBWidth:INSTrument[:SELect] <mode>
```

Response

```
<mode>
```

Parameter

`<mode>`	Measurement mode
`FFT`	Signal Analyzer function
`SWEP`	Spectrum analyzer function

Example of Use

To query the measurement mode to be applied when executing the OBW measurement function.

```
OBW:INST?
> FFT
```

2.7 Modulation Measurement Function

This section describes device messages for Modulation measurement.

Table 2.7-1 lists device messages for executing Modulation measurement and querying the result.

Table 2.7-1 Device Messages for Modulation Measurement Functions

Function	Device Messages
Configure	:CONFigure:EVM
Initiate	:INITiate:EVM
Fetch	:FETCh:EVM[n]?
Read/Measure	:READ:EVM[n]?
	:MEASure:EVM[n]?

Table 2.7-2 lists the responses to parameter [n] of the device messages in Table 2.7-1.

Table 2.7-2 Responses to Modulation Measurement Results

n	Result Mode	Response
1 or omitted	A/B	The measurement results for the Channel included at Target Channel are returned in the following order separated by commas (,). 1. Frequency Error (Average) 2. Frequency Error (max) 3. Output Power (Average) 4. Output Power (max) 5. Mean Power (Average) 6. Mean Power (max) 7. EVM rms (Average) 8. EVM rms (max) 9. EVM peak (Average) 10. EVM peak (max) 11. EVM peak Symbol Number 12. EVM peak Demod-Symbol Number 13. Origin Offset (Average) 14. Origin Offset (max) 15. Time Offset (Average) 16. Time Offset (max) 17. Frequency Error PPM (Average) ppm 18. Frequency Error PPM (Maximum) ppm 19. Output Power (min) 20. Mean Power (min) ***Note:*** When Target Channel is not PRACH, the measured results are enabled. At PRACH, invalid is recorded and displayed. Results for 7, 8, 9, 10, 11, and 12 depend on the set Target Channel.

Table 2.7-2 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 2. Total EVM rms (Average) 3. Total EVM rms (max) 4. Total EVM peak (Average) 5. Total EVM peak (max) 6. Total EVM peak Symbol Number 7. Total EVM peak Subcarrier Number 8. Total EVM High rms (Average) 9. Total EVM High rms (max) 10. Total EVM High peak (Average) 11. Total EVM High peak (max) 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 (max) 16. Total EVM Low peak (Average) 17. Total EVM Low peak (max) 18. Total EVM Low peak Symbol Number 19. Total EVM Low peak Subcarrier Number 20. PUSCH ALL EVM result valid 21. PUSCH ALL EVM rms (Average) 22. PUSCH ALL EVM rms (max) 23. PUSCH ALL EVM peak (Average) 24. PUSCH ALL EVM peak (max) 25. PUSCH ALL EVM peak Symbol Number 26. PUSCH ALL EVM peak Subcarrier Number 27. PUSCH ALL EVM High rms (Average) 28. PUSCH ALL EVM High rms (max) 29. PUSCH ALL EVM High peak (Average) 30. PUSCH ALL EVM High peak (max) 31. PUSCH ALL EVM High peak Symbol Number 32. PUSCH ALL EVM High peak Subcarrier Number 33. PUSCH ALL EVM Low rms (Average) 34. PUSCH ALL EVM Low rms (max) 35. PUSCH ALL EVM Low peak (Average)

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	36. PUSCH ALL EVM Low peak (max) 37. PUSCH ALL EVM Low peak Symbol Number 38. PUSCH ALL EVM Low peak Subcarrier Number 39. PUSCH QPSK EVM result valid 40. PUSCH QPSK EVM rms (Average) 41. PUSCH QPSK EVM rms (max) 42. PUSCH QPSK EVM peak (Average) 43. PUSCH QPSK EVM peak (max) 44. PUSCH QPSK EVM peak Symbol Number 45. PUSCH QPSK EVM peak Subcarrier Number 46. PUSCH QPSK EVM High rms (Average) 47. PUSCH QPSK EVM High rms (max) 48. PUSCH QPSK EVM High peak (Average) 49. PUSCH QPSK EVM High peak (max) 50. PUSCH QPSK EVM High peak Symbol Number 51. PUSCH QPSK EVM High peak Subcarrier Number 52. PUSCH QPSK EVM Low rms (Average) 53. PUSCH QPSK EVM Low rms (max) 54. PUSCH QPSK EVM Low peak (Average) 55. PUSCH QPSK EVM Low peak (max) 56. PUSCH QPSK EVM Low peak Symbol Number 57. PUSCH QPSK EVM Low peak Subcarrier Number 58. PUSCH 16QAM EVM result valid 59. PUSCH 16QAM EVM rms (Average) 60. PUSCH 16QAM EVM rms (max) 61. PUSCH 16QAM EVM peak (Average) 62. PUSCH 16QAM EVM peak (max) 63. PUSCH 16QAM EVM peak Symbol Number 64. PUSCH 16QAM EVM peak Subcarrier Number 65. PUSCH 16QAM EVM High rms (Average) 66. PUSCH 16QAM EVM High rms (max) 67. PUSCH 16QAM EVM High peak (Average) 68. PUSCH 16QAM EVM High peak (max) 69. PUSCH 16QAM EVM High peak Symbol Number 70. PUSCH 16QAM EVM High peak Subcarrier Number

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	71. PUSCH 16QAM EVM Low rms (Average) 72. PUSCH 16QAM EVM Low rms (max) 73. PUSCH 16QAM EVM Low peak (Average) 74. PUSCH 16QAM EVM Low peak (max) 75. PUSCH 16QAM EVM Low peak Symbol Number 76. PUSCH 16QAM EVM Low peak Subcarrier Number 77. PUSCH 64QAM EVM result valid 78. PUSCH 64QAM EVM rms (Average) 79. PUSCH 64QAM EVM rms (max) 80. PUSCH 64QAM EVM peak (Average) 81. PUSCH 64QAM EVM peak (max) 82. PUSCH 64QAM EVM peak Symbol Number 83. PUSCH 64QAM EVM peak Subcarrier Number 84. PUSCH 64QAM EVM High rms (Average) 85. PUSCH 64QAM EVM High rms (max) 86. PUSCH 64QAM EVM High peak (Average) 87. PUSCH 64QAM EVM High peak (max) 88. PUSCH 64QAM EVM High peak Symbol Number 89. PUSCH 64QAM EVM High peak Subcarrier Number 90. PUSCH 64QAM EVM Low rms (Average) 91. PUSCH 64QAM EVM Low rms (max) 92. PUSCH 64QAM EVM Low peak (Average) 93. PUSCH 64QAM EVM Low peak (max) 94. PUSCH 64QAM EVM Low peak Symbol Number 95. PUSCH 64QAM EVM Low peak Subcarrier Number 96. RS EVM result valid 97. RS EVM rms (Average) 98. RS EVM rms (max) 99. RS EVM peak (Average) 100. RS EVM peak (max) 101. RS EVM peak Symbol Number 102. RS EVM peak Subcarrier Number 103. RS EVM High rms (Average) 104. RS EVM High rms (max) 105. RS EVM High peak (Average)

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
2	A/B	106. RS EVM High peak (max) 107. RS EVM High peak Symbol Number 108. RS EVM High peak Subcarrier Number 109. RS EVM Low rms (Average) 110. RS EVM Low rms (max) 111. RS EVM Low peak (Average) 112. RS EVM Low peak (max) 113. RS EVM Low peak Symbol Number 114. RS EVM Low peak Subcarrier Number ***Note:*** When total EVM result valid is invalid (argument is 0), the Total EVM measurement result is not measured. Same for PUSCH ALL EVM to RS EVM. When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH. However, here RS indicates Demodulation-RS. For PUCCH 20 to 95 are invalid values; for SRS, 20 to 95 and 96 to 114 are recorded and displayed as invalid values.

Table 2.7-2 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 ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
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 (rms) 2. EVM (rms) of the 1st subcarrier (rms) … N. EVM (rms) of the (N–1)th subcarrier ***Note:*** Executable even when EVM vs Subcarrier is not selected for the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
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 the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
6	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M EVM vs Symbol (rms) 1. EVM of the 0th symbol (rms) 2. EVM of the 1st symbol (rms) … EVM (rms) of the (M –1)th symbol ***Note:*** Executable even when EVM vs Symbol is not selected for the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
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 (peak) 2. EVM (peak) of the 1st symbol (peak) … M. EVM (peak) of the (M–1)th symbol ***Note:*** Executable even when EVM vs Symbol is not selected for the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
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 the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
9	A/B	Responses are returned with comma-separated value formats in the following order: 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 amplitude of the (N − 2)th subcarrier ***Note:*** Executable even when Spectral Flatness Difference Amplitude is not selected for the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
10	A/B	Responses are returned with comma-separated value formats in the following order: 1 to N Spectral flatness amplitude 1. Spectral flatness phase of the 0th subcarrier 2. Spectral flatness phase of the 1st subcarrier … N. Spectral flatness amplitude of the (N − 1)th subcarrier ***Note:*** Executable even when Spectral Flatness Phase is not selected for the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.
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 the Graph window. ***Note:*** When Target Channel is not PRACH, the measured results are enabled. Invalid value is displayed for PRACH.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
12	A/B	Responses are returned with comma-separated value formats in the following order: 1. EVM PUCCH result valid 2. EVM PUCCH rms (Average) 3. EVM PUCCH rms (max) 4. EVM PUCCH peak (Average) 5. EVM PUCCH peak (max) 6. EVM PUCCH peak symbol position 7. EVM PUCCH peak subcarrier position 8. EVM PUCCH High rms (Average) 9. EVM PUCCH High rms (max) 10. EVM PUCCH High peak (Average) 11. EVM PUCCH High peak (max) 12. EVM PUCCH High peak symbol position 13. EVM PUCCH High peak subcarrier position 14. EVM PUCCH Low rms (Average) 15. EVM PUCCH Low rms (max) 16. EVM PUCCH Low peak (Average) 17. EVM PUCCH Low peak (max) 18. EVM PUCCH Low peak symbol position 19. EVM PUCCH Low peak subcarrier position ***Note:*** When EVM PUCCH result valid is invalid (argument is 0), the measurement result is no measurement. The measurement results are valid only when Target Channel is PUCCH.

Table 2.7-2 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: 1 to (2×(Element Number+1))+1 PUSCH Constellation 1. Number of valid results (Number of PUSCHs with valid measurement results) 2. I-phase data of the 0th PUSCH 3. Q-phase data of the 0th PUSCH 4. I-phase data of the 1st PUSCH 5. Q-phase data of the 1st PUSCH … 2 × (Element Number+1). I-phase data of PUSCH number specified by Element Number (2 × (Element Number+1))+1. Q-phase data of PUSCH number specified by Element Number ***Note:*** When PUSCH ALL EVM result valid is invalid, measurement is not performed. PUSCH Constellation returns data of the subframe set by the Subframe Number (Command: `CALCulate:EVM:WINDow8:SUBFrame:NUMBer`). ***Note:*** When Target Channel is not PUSCH, "0" is returned as the response.
14	A/B	1 to all measurement target Subframe PUCCH Constellation Element Number 1. Number of valid results (Number of PUCCHs with valid measurement results) 2. I-phase data of 0th PUSCH of target Subframe 3. Q-phase data of 0th PUSCH of target Subframe 4. I-phase data of 1st PUSCH of target Subframe 5. Q-phase data of 1st PUSCH of target Subframe … ***Note:*** When Target Channel is not set to PUCCH, "0" is returned as the response.

Table 2.7-2 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 (2×(Element Number+1)) RS Constellation 1. Number of valid results (Number of RSs with valid measurement results) 2. I-phase data of the 0th RS 3. Q-phase data of the 0th RS … 2 × (Element Number+1). I-phase data of Element Number RS (2 × (Element Number+1))+1. I-phase data of Element Number RS ***Note:*** When RS EVM result valid is invalid, measurement is not performed. ***Note:*** When Target Channel is not set to PUSCH or PUCCH, "0" is returned as the response.

Table 2.7-2 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. Power of 0th slot (Average) 2. Power of 1st slot (Average) … 19. Power of 18th slot (Average) 20 Power of 19th slot (Average) 21. Power of 0th slot (Maximum) 22. Power of 1st slot (Maximum) … 39. Power of 18th slot (Maximum) 40 Power of 19th slot (Maximum) 41. Power of 0th slot (Maximum) 42. Power of 1st slot (Maximum) … 59. Power of 18th slot (Maximum) 60 Power of 19th slot (Maximum) ***Note:*** Measurement is not performed for a range exceeding Measurement Interval. ***Note:*** When Target Channel is PRACH, disabled value is returned.

Table 2.7-2 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: The following values correspond to Total EVM (Time Based). 1. Total EVM result valid 2. Total EVM rms (Average) 3. Total EVM rms (max) 4. Total EVM peak (Average) 5. Total EVM peak (max) 6. Total EVM peak Symbol Number 7. Total EVM peak Demod-Symbol Number 8. Total EVM High rms (Average) 9. Total EVM High rms (max) 10. Total EVM High peak (Average) 11. Total EVM High peak (max) 12. Total EVM High peak Symbol Number 13. Total EVM High peak Demod-Symbol Number 14. Total EVM Low rms (Average) 15. Total EVM Low rms (max) 16. Total EVM Low peak (Average) 17. Total EVM Low peak (max) 18. Total EVM Low peak Symbol Number 19. Total EVM Low peak Demod-Symbol Number 20. PUSCH ALL EVM result valid 21. PUSCH ALL EVM rms (Average) 22. PUSCH ALL EVM rms (max) 23. PUSCH ALL EVM peak (Average) 24. PUSCH ALL EVM peak (max) 25. PUSCH ALL EVM peak Symbol Number 26. PUSCH ALL EVM peak Subcarrier Number 27. PUSCH ALL EVM High rms (Average) 28. PUSCH ALL EVM High rms (max) 29. PUSCH ALL EVM High peak (Average) 30. PUSCH ALL EVM High peak (max) 31. PUSCH ALL EVM High peak Symbol Number 32. PUSCH ALL EVM High peak Subcarrier Number 33. PUSCH ALL EVM Low rms (Average) 34. PUSCH ALL EVM Low rms (max) 35. PUSCH ALL EVM Low peak (Average)

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
17	A/B	36. PUSCH ALL EVM Low peak (max) 37. PUSCH ALL EVM Low peak Symbol Number 38. PUSCH ALL EVM Low peak Subcarrier Number 39. PUSCH QPSK EVM result valid 40. PUSCH QPSK EVM rms (Average) 41. PUSCH QPSK EVM rms (max) 42. PUSCH QPSK EVM peak (Average) 43. PUSCH QPSK EVM peak (max) 44. PUSCH QPSK EVM peak Symbol Number 45. PUSCH QPSK EVM peak Subcarrier Number 46. PUSCH QPSK EVM High rms (Average) 47. PUSCH QPSK EVM High rms (max) 48. PUSCH QPSK EVM High peak (Average) 49. PUSCH QPSK EVM High peak (max) 50. PUSCH QPSK EVM High peak Symbol Number 51. PUSCH QPSK EVM High peak Subcarrier Number 52. PUSCH QPSK EVM Low rms (Average) 53. PUSCH QPSK EVM Low rms (max) 54. PUSCH QPSK EVM Low peak (Average) 55. PUSCH QPSK EVM Low peak (max) 56. PUSCH QPSK EVM Low peak Symbol Number 57. PUSCH QPSK EVM Low peak Subcarrier Number 58. PUSCH 16QAM EVM result valid 59. PUSCH 16QAM EVM rms (Average) 60. PUSCH 16QAM EVM rms (max) 61. PUSCH 16QAM EVM peak (Average) 62. PUSCH 16QAM EVM peak (max) 63. PUSCH 16QAM EVM peak Symbol Number 64. PUSCH 16QAM EVM peak Subcarrier Number 65. PUSCH 16QAM EVM High rms (Average) 66. PUSCH 16QAM EVM High rms (max) 67. PUSCH 16QAM EVM High peak (Average) 68. PUSCH 16QAM EVM High peak (max) 69. PUSCH 16QAM EVM High peak Symbol Number 70. PUSCH 16QAM EVM High peak Subcarrier Number

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
17	A/B	71. PUSCH 16QAM EVM Low rms (Average) 72. PUSCH 16QAM EVM Low rms (max) 73. PUSCH 16QAM EVM Low peak (Average) 74. PUSCH 16QAM EVM Low peak (max) 75. PUSCH 16QAM EVM Low peak Symbol Number 76. PUSCH 16QAM EVM Low peak Subcarrier Number 77. PUSCH 64QAM EVM result valid 78. PUSCH 64QAM EVM rms (Average) 79. PUSCH 64QAM EVM rms (max) 80. PUSCH 64QAM EVM peak (Average) 81. PUSCH 64QAM EVM peak (max) 82. PUSCH 64QAM EVM peak Symbol Number 83. PUSCH 64QAM EVM peak Subcarrier Number 84. PUSCH 64QAM EVM High rms (Average) 85. PUSCH 64QAM EVM High rms (max) 86. PUSCH 64QAM EVM High peak (Average) 87. PUSCH 64QAM EVM High peak (max) 88. PUSCH 64QAM EVM High peak Symbol Number 89. PUSCH 64QAM EVM High peak Subcarrier Number 90. PUSCH 64QAM EVM Low rms (Average) 91. PUSCH 64QAM EVM Low rms (max) 92. PUSCH 64QAM EVM Low peak (Average) 93. PUSCH 64QAM EVM Low peak (max) 94. PUSCH 64QAM EVM Low peak Symbol Number 95. PUSCH 64QAM EVM Low peak Subcarrier Number ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
18	A/B	Responses are returned with comma-separated value formats in the following order: The following values correspond to Total EVM (Time Based). 1. Total EVM rms of 0th slot (Average) 2. Total EVM rms of 0th slot (max) 3. Total EVM peak of 0th slot (Average) 4. Total EVM peak of 0th slot (max) 5. Total EVM peak Demod-Symbol Number of 0th slot … 96. Total EVM rms of 19th slot (Average) 97. Total EVM rms of 19th slot (max) 98. Total EVM peak of 19th slot (Average) 99. Total EVM peak of 19th slot (max) 100. Total EVM peak Demod-Symbol Number of 19th slot ***Note:*** Measurement is not performed for a range exceeding Measurement Interval. ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.
19	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M Time Based EVM (rms) M = 14 × Measurement Interval setting 1. EVM of the 0th symbol (rms) 2. EVM of the 1st symbol (rms) … M. EVM (rms) of the (M –1)th symbol ***Note:*** Executable even when Time Based EVM is not selected for the Graph window. For the 3rd and 10th symbols in a subframe, –999.0 is always returned. ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
20	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M Time Based EVM (peak) M = 14 × Measurement Interval setting 1. EVM (peak) of the 0th symbol (peak) 2. EVM (peak) of the 1st symbol (peak) … M. EVM (peak) of the (M–1)th symbol ***Note:*** Executable even when Time Based EVM is not selected for the Graph window. For the 3rd and 10th symbols in a subframe, –999.0 is always returned. ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.
21	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M EVM vs Symbol (rms) M = 12 × Number of RBs setting 1. EVM of the 0th symbol (rms) 2. EVM of the 1st symbol (rms) … M. EVM (rms) of the (M –1)th symbol ***Note:*** Executable even when EVM vs Demod-Symbol is not selected for the Graph window. ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
22	A/B	Responses are returned with comma-separated value formats in the following order: 1 to M EVM vs Demod-Symbol (peak) M = 12 × Number of RBs setting 1. EVM (peak) of the 0th symbol (peak) 2. EVM (peak) of the 1st symbol (peak) … M. EVM (peak) of the (M–1)th symbol ***Note:*** Executable even when EVM vs Symbol is not selected for the Graph window. ***Note:*** The measurement results are valid only when Target Channel is PUSCH. In other cases, invalid is recorded and displayed.
23	A/B	Responses are returned with comma-separated value formats in the following order: 1. Frequency Error (Average) of the 0th Slot [Hz] 2. Frequency Error (Maximum) of the 0th Slot [Hz] 3. Frequency Error (Average) of the 0th Slot [ppm] 4. Frequency Error (Maximum) of the 0th Slot [ppm] … 77. Frequency Error (Average) of the 19th Slot [Hz] 78. Frequency Error (Maximum) of the 19th Slot [Hz] 79. Frequency Error (Average) of the 19th Slot [ppm] 80. Frequency Error (Maximum) of the 19th Slot [ppm] ***Note:*** When Target Channel is PRACH, disabled value is returned.
24	A/B	Responses are returned with comma-separated value formats in the following order: 1. Origin Offset (Average) of the 0th Slot [dB] 2. Origin Offset (Maximum) of the 0th Slot [dB] … 79. Origin Offset (Average) of the 19th Slot [dB] 80. Origin Offset (Maximum) of the 19th Slot [dB] ***Note:*** When Target Channel is PRACH, disabled value is returned.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
25	A/B	1 to N Spectral flatness amplitude 1. Spectral flatness amplitude Max of the 0th subcarrier 2. Spectral flatness amplitude Max of the 1st subcarrier … N. Spectral flatness amplitude Max of the (N − 1)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
26	A/B	1 to N Spectral flatness amplitude 1. Spectral flatness amplitude Min of the 0th subcarrier 2. Spectral flatness amplitude Min of the 1st subcarrier … N. Spectral flatness amplitude Min of the (N − 1)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
27	A/B	1 to N–2 Spectral flatness differential amplitude 1. Spectral flatness differential amplitude Max of the 1st subcarrier 2. Spectral flatness differential amplitude Max of the 2nd subcarrier … N–2. Spectral flatness differential amplitude Max of the (N − 2)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
28	A/B	1 to N–2 Spectral flatness differential amplitude 1. Spectral flatness differential amplitude Min of the 1st subcarrier 2. Spectral flatness differential amplitude Min of the 2nd subcarrier … N–2. Spectral flatness differential amplitude Min of the (N − 2)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
29	A/B	1 to N Spectral flatness amplitude 1. Spectral flatness phase Max of the 0th subcarrier 2. Spectral flatness phase Max of the 1st subcarrier … N. Spectral flatness phase Max of the (N − 1)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
30	A/B	1 to N Spectral flatness amplitude 1. Spectral flatness phase Min of the 0th subcarrier 2. Spectral flatness phase Min of the 1st subcarrier … N. Spectral flatness phase Min of the (N − 1)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
31	A/B	1 to N−2 Spectral flatness group delay 1. Spectral flatness group delay Max of the 1st subcarrier 2. Spectral flatness group delay Max of the 2nd subcarrier … N–2. Spectral flatness group delay Max of the (N − 2)th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.
32	A/B	1 to N−2 Spectral flatness group delay 1. Spectral flatness group delay Min of the (N − 1) th subcarrier 2. Spectral flatness group delay Min of the (N − 2) th subcarrier … N–2. Spectral flatness group delay Min of the (N − 2) th subcarrier ***Note:*** When Target Channel is PRACH, invalid value is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
33	A/B	The averaged waveform for In-Band Emission vs Subcarrier at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is (RB count) x 12. 1 to N In-Band Emission vs Subcarrier GI Avg 1. In-Band Emission vs Subcarrier GI Avg of the 0th subcarrier. 2. In-Band Emission vs Subcarrier GI Avg of the 1st subcarrier. … N.In-Band Emission vs Subcarrier GI Avg of the (N − 1) th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, disabled value is recorded and displayed.
34	A/B	The peak value of the PeakHold waveform for In-Band Emission vs Subcarrier at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is (RB count) x 12. 1 to N In-Band Emission vs Subcarrier GI Max 1.In-Band Emission vs Subcarrier GI Max of the 0th subcarrier. 2.In-Band Emission vs Subcarrier GI Max of the 1st subcarrier. … N.In-Band Emission vs Subcarrier GI Max of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, disabled value is recorded and displayed.
35	A/B	The dip value of the PeakHold waveform for In-Band Emission vs Subcarrier at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is (RB count) x 12. 1 to N In-Band Emission vs Subcarrier GI Min 1. In-Band Emission vs Subcarrier GI Min of the 0th subcarrier. 2. In-Band Emission vs Subcarrier GI Min of the 1st subcarrier. … N.In-Band Emission vs Subcarrier GI Min of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
36	A/B	The averaged waveform for In-Band Emission vs Subcarrier at In-band Emissions General/DC measurement is read. The measurement units are dBc. The measurement count N is (RB count) x 12. 1 to N Power vs Subcarrier DC Avg 1. In-Band Emission vs Subcarrier DC Avg of the 0th subcarrier. 2. In-Band Emission vs Subcarrier DC Avg of the 1st subcarrier. … N.In-Band Emission vs Subcarrier DC Avg of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.
37	A/B	The peak value of the PeakHold waveform for In-Band Emission vs Subcarrier at In-band Emissions General/DC measurement is read. The measurement units are dBc. The measurement count N is (RB count) x 12. 1 to N In-Band Emission vs Subcarrier DC Max 1. In-Band Emission vs Subcarrier DC Max of the 0th subcarrier. 2. In-Band Emission vs Subcarrier DC Max of the 1st subcarrier. … N.In-Band Emission vs Subcarrier DC Max of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.
38	A/B	The dip value of the PeakHold waveform for In-Band Emission vs Subcarrier at In-band Emissions General/DC measurement is read. The measurement units are dBc. The measurement count N is (RB count) x 12. 1 to N In-Band Emission vs Subcarrier DC Min 1. In-Band Emission vs Subcarrier DC Min of the 0th subcarrier. 2. In-Band Emission vs Subcarrier DC Min of the 1st subcarrier. … N.In-Band Emission vs Subcarrier DC Min of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
39	A/B	The averaged waveform for In-Band Emission vs RB at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is RB count. 1 to N In-Band Emission vs RB GI Avg 1. In-Band Emission vs Subcarrier RB GI Avg of the 0th subcarrier. 2. In-Band Emission vs Subcarrier RB GI Avg of the 1st subcarrier. … N. In-Band Emission vs Subcarrier RB GI Avg of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.
40	A/B	The peak value for the PeakHold waveform for In-Band Emission vs RB at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is RB count. 1 to N In-Band Emission vs RB GI Max 1. In-Band Emission vs RB GI Max of the 0th subcarrier. 2. In-Band Emission vs RB GI Max of the 1st subcarrier. … N. In-Band Emission vs RB GI Max of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
41	A/B	The dip value for the PeakHold waveform for In-Band Emission vs RB at In-band Emissions General/IQ Image measurement is read. The measurement units are dB. The measurement count N is RB count. 1 to N In-Band Emission vs RB GI Min 1.In-Band Emission vs Subcarrier RB GI Min of the 0th subcarrier. 2.In-Band Emission vs Subcarrier RB GI Min of the 1st subcarrier. … N. In-Band Emission vs RB GI Min of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.
42	A/B	The averaged waveform for In-Band Emission vs RB at In-band Emissions/DC measurement is read. The measurement units are dBc. The measurement count N is RB count. 1 to N In-Band Emission vs RB DC Avg 1. In-Band Emission vs Subcarrier RB GI Avg of the 0th subcarrier. 2. In-Band Emission vs Subcarrier RB GI Avg of the 1st subcarrier. … N. In-Band Emission vs Subcarrier RB DC Avg of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
43	A/B	The peak value for the PeakHold waveform for In-Band Emission vs RB at In-band Emissions/DC measurement is read. The measurement units are dBc. The measurement count N is RB count. 1 to N In-Band Emission vs RB DC Max 1. In-Band Emission vs RB DC Max of the 0th subcarrier. 2. In-Band Emission vs RB DC Max of the 1st subcarrier. … N. In-Band Emission vs RB DC Max of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.
44	A/B	The dip value for the PeakHold waveform for In-Band Emission vs RB at In-band Emissions/DC measurement is read. The measurement units are dBc. The measurement count N is RB count. 1 to N In-Band Emission vs RB DC Min 1. In-Band Emission vs RB DC Max of the 0th subcarrier. 2. In-Band Emission vs RB DC Max of the 1st subcarrier. … N. In-Band Emission vs RB DC Max of the (N − 1)th subcarrier. ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
45	A/B	1 to all measurement target Subframe SRS Constellation Element Number 1. Number of valid results (Number of SRSs with valid measurement results) 2. I-phase data for 0th SRS for target Subframe 3. Q-phase data for 0th SRS for target Subframe 4. I-phase data for 1st SRS for target Subframe 5. Q-phase data for 1st SRS for target Subframe … ***Note:*** The measurement results are valid only when Target Channel is SRS. The measurements are not recorded when Result Valid becomes disabled (argument is 0).
46	A/B	Responses are returned with comma-separated value formats in the following order: 1. EVM PUSCH result valid 2. EVM PUSCH ALL rms (Average) 3. EVM PUSCH ALL rms (max) 4. EVM PUSCH ALL peak (Average) 5. EVM PUSCH ALL peak (max) 6. EVM PUSCH ALL peak symbol position 7. EVM PUSCH ALL peak subcarrier position 8. EVM PUSCH ALL High rms (Average) 9. EVM PUSCH ALL High rms (max) 10. EVM PUSCH ALL High peak (Average) 11. EVM PUSCH ALL High peak (max) 12. EVM PUSCH ALL High peak symbol position 13. EVM PUSCH ALL High peak subcarrier position 14. EVM PUSCH ALL Low rms (Average) 15. EVM PUSCH ALL Low rms (max) 16. EVM PUSCH ALL Low peak (Average) 17. EVM PUSCH ALL Low peak (max) 18. EVM PUSCH ALL Low peak symbol position 19. EVM PUSCH ALL Low peak subcarrier position 20. PUSCH QPSK EVM result valid 21. PUSCH QPSK EVM rms (Average) 22. PUSCH QPSK EVM rms (max) 23. PUSCH QPSK EVM peak (Average) 24. PUSCH QPSK EVM peak (max) 25. PUSCH QPSK EVM peak Symbol Number

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
46	A/B	26. PUSCH QPSK EVM peak Subcarrier Number 27. PUSCH QPSK EVM High rms (Average) 28. PUSCH QPSK EVM High rms (max) 29. PUSCH QPSK EVM High peak (Average) 30. PUSCH QPSK EVM High peak (max) 31. PUSCH QPSK EVM High peak Symbol Number 32. PUSCH QPSK EVM High peak Subcarrier Number 33. PUSCH QPSK EVM Low rms (Average) 34. PUSCH QPSK EVM Low rms (max) 35. PUSCH QPSK EVM Low peak (Average) 36. PUSCH QPSK EVM Low peak (max) 37. PUSCH QPSK EVM Low peak Symbol Number 38. PUSCH QPSK EVM Low peak Subcarrier Number 39. PUSCH 16QAM EVM result valid 40. PUSCH 16QAM EVM rms (Average) 41. PUSCH 16QAM EVM rms (max) 42. PUSCH 16QAM EVM peak (Average) 43. PUSCH 16QAM EVM peak (max) 44. PUSCH 16QAM EVM peak Symbol Number 45. PUSCH 16QAM EVM peak Subcarrier Number 46. PUSCH 16QAM EVM High rms (Average) 47. PUSCH 16QAM EVM High rms (max) 48. PUSCH 16QAM EVM High peak (Average) 49. PUSCH 16QAM EVM High peak (max) 50. PUSCH 16QAM EVM High peak Symbol Number 51. PUSCH 16QAM EVM High peak Subcarrier Number 52. PUSCH 16QAM EVM Low rms (Average) 53. PUSCH 16QAM EVM Low rms (max) 54. PUSCH 16QAM EVM Low peak (Average) 55. PUSCH 16QAM EVM Low peak (max) 56. PUSCH 16QAM EVM Low peak Symbol Number 57. PUSCH 16QAM EVM Low peak Subcarrier Number 58. PUSCH 64QAM EVM result valid 59. PUSCH 64QAM EVM rms (Average) 60. PUSCH 64QAM EVM rms (max)

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
46	A/B	61. PUSCH 64QAM EVM peak (Average) 62. PUSCH 64QAM EVM peak (max) 63. PUSCH 64QAM EVM peak Symbol Number 64. PUSCH 64QAM EVM peak Subcarrier Number 65. PUSCH 64QAM EVM High rms (Average) 66. PUSCH 64QAM EVM High rms (max) 67. PUSCH 64QAM EVM High peak (Average) 68. PUSCH 64QAM EVM High peak (max) 69. PUSCH 64QAM EVM High peak Symbol Number 70.PUSCH 64QAM EVM High peak Subcarrier Number 71. PUSCH 64QAM EVM Low rms (Average) 72. PUSCH 64QAM EVM Low rms (max) 73. PUSCH 64QAM EVM Low peak (Average) 74. PUSCH 64QAM EVM Low peak (max) 75 PUSCH 64QAM EVM Low peak Symbol Number 76. PUSCH 64QAM EVM Low peak Subcarrier Number ***Note:*** The measurement results are valid only when Target Channel is PUSCH. The 1 to 19 measurement results are recorded as invalid when EVM PUSCH result valid becomes invalid (argument is 0). The 21 to 38 measurement results are recorded as invalid when PUSCH QPSK EVM result valid becomes invalid (argument is 0). The 39 to 57 measurement results are recorded as invalid when PUSCH 16QAM EVM result valid becomes invalid (argument is 0). The 59 to 76 measurement results are recorded as invalid when PUSCH 64QAM EVM result valid becomes invalid (argument is 0).

Table 2.7-2 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. EVM SRS result valid 2. EVM SRS rms (Average) 3. EVM SRS rms (max) 4. EVM SRS peak (Average) 5. EVM SRS peak (max) 6. EVM SRS peak symbol position 7. EVM SRS peak subcarrier position 8. EVM SRS High rms (Average) 9. EVM SRS High rms (max) 10. EVM SRS High peak (Average) 11. EVM SRS High peak (max) 12. EVM SRS High peak symbol position 13. EVM SRS High peak subcarrier position 14. EVM SRS Low rms (Average) 15. EVM SRS Low rms (max) 16. EVM SRS Low peak (Average) 17. EVM SRS Low peak (max) 18. EVM SRS Low peak symbol position 19. EVM SRS Low peak subcarrier position ***Note:*** The measurement results are valid only when Target Channel is SRS. The measurement results are recorded as invalid when EVM SRS result valid becomes invalid (argument is 0).

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
48	A/B	Responses are returned with comma-separated value formats in the following order: 1. EVM RS result valid 2. EVM RS rms (Average) 3. EVM RS rms (max) 4. EVM RS peak (Average) 5. EVM RS peak (max) 6. EVM RS peak symbol position 7. EVM RS peak subcarrier position 8. EVM RS High rms (Average) 9. EVM RS High rms (max) 10. EVM RS High peak (Average) 11. EVM RS High peak (max) 12. EVM RS High peak symbol position 13. EVM RS High peak subcarrier position 14. EVM RS Low rms (Average) 15. EVM RS Low rms (max) 16. EVM RS Low peak (Average) 17. EVM RS Low peak (max) 18. EVM RS Low peak symbol position 19. EVM RS Low peak subcarrier position ***Note:*** The Target Channel PUSCH/PUCCH measurement results are valid. The measurement results are recorded as invalid when EVM RS result valid becomes invalid (argument is 0). Here RS indicates DemodulationRS.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
49	A/B	Responses are returned with comma-separated value formats in the following order: 1. Frequency Error (Average) 2. Frequency Error (max) 3. Output Power (Average) 4. Output Power (max) 5. Output Power (min) 6. Mean Power (Average) 7. Mean Power (max) 8. Mean Power (min) 9. EVM rms (Average) 10. EVM rms (max) 11. EVM peak (Average) 12. EVM peak (max) 13. EVM peak Subcarrier Number 14. Origin Offset (Average) 15. Origin Offset (max) 16. Time Offset (Average) 17. Time Offset (max) 18. Frequency Error PPM (Average) ppm 19. Frequency Error PPM (Maximum) ppm 20. EVM peak Preamble Sequence Number ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, the measurement results are recorded as invalid.
50	A/B	1 to 2 × N PRACH 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 ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, the results are not recorded.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
51	A/B	1 to N PRACH EVM vs Subcarrier (rms) 1. EVM (rms) of the 0th subcarrier (rms) 2. EVM (rms) of the 1st subcarrier (rms) … N. EVM (rms) of the (N–1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
52	A/B	1 to N PRACH 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:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
53	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness amplitude 1. PRACH spectral flatness amplitude Avg of the 0th subcarrier 2. PRACH spectral flatness amplitude Avg of the 1st subcarrier … N. PRACH spectral flatness amplitude Avg of the (N–1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
54	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness amplitude 1. PRACH spectral flatness amplitude Max of the 0th subcarrier 2. PRACH spectral flatness amplitude Max of the 1st subcarrier … N. PRACH spectral flatness amplitude Max of the (N–1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
55	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness amplitude 1. PRACH spectral flatness amplitude Min of the 0th subcarrier 2. PRACH spectral flatness amplitude Min of the 1st subcarrier … N. PRACH spectral flatness amplitude Min of the (N–1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
56	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness differential amplitude 1. Spectral flatness differential amplitude Avg of the 0th subcarrier 2. Spectral flatness differential amplitude Avg of the 1st subcarrier … N. Spectral flatness differential amplitude Avg of the (N–1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
57	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness differential amplitude 1. Spectral flatness differential amplitude Max of the 0th subcarrier 2. Spectral flatness differential amplitude Max of the 1st subcarrier … N. Spectral flatness differential amplitude Max of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
58	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness differential amplitude 1. Spectral flatness differential amplitude Min of the 0th subcarrier 2. Spectral flatness differential amplitude Min of the 1st subcarrier … N. Spectral flatness differential amplitude Min of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
59	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness phase 1. Spectral flatness phase Avg of the 0th subcarrier 2. Spectral flatness phase Avg of the 1st subcarrier … N. Spectral flatness phase Avg of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
60	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness phase 1. Spectral flatness phase Max of the 0th subcarrier 2. Spectral flatness phase Max of the 1st subcarrier … N. Spectral flatness phase Max of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
61	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness phase 1. Spectral flatness phase Min of the 0th subcarrier 2. Spectral flatness phase Min of the 1st subcarrier … N. Spectral flatness phase Min of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
62	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness group delay 1. Spectral flatness group delay Avg of the 0th subcarrier 2. Spectral flatness group delay Avg of the 1st subcarrier … N. Spectral flatness group delay Avg of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
63	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness group delay 1. Spectral flatness group delay Max of the 0th subcarrier 2. Spectral flatness group delay Max of the 1st subcarrier … N. Spectral flatness group delay Max of the (N − 1)th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.
64	A/B	The Frequency Offset × 144 + 13th subcarrier results are returned in the following comma-separated order as the as the 0th subcarrier results. 1 to N PRACH spectral flatness group delay 1. Spectral flatness group delay Min of the 0th subcarrier 2. Spectral flatness group delay Min of the 1st subcarrier … N. Spectral flatness group delay Min of the (N − 1) th subcarrier ***Note:*** The Target Channel PRACH measurement results are valid. In other cases, invalid is recorded and displayed.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
68	A/B	In Band Emission numeric results Responses are returned with comma-separated value formats in the following order: 1. General (Exclude DC/IQ) Emission (Average) 2. General (Exclude DC/IQ) Emission (max) 3. General (Exclude DC/IQ) Emission peak (Average) 4. General (Exclude DC/IQ) Emission peak (max) 5. General (Exclude DC/IQ) Emission peak Power 6. General (Exclude DC/IQ) Emission peak Resource Block Number 7. General (Exclude DC/IQ) Emission peak Slot Number 8. IQ Image Emission (Average) 9. IQ Image Emission (max) 10. IQ Image Emission peak (Average) 11. IQ Image Emission peak (max) 12. IQ Image Emission peak Power 13. IQ Image Emission peak Resource Block Number 14. IQ Image Emission peak Slot Number 15. DC Emission (Average) 16. DC Emission (max) 17. DC Emission peak (Average) 18. DC Emission peak (max) 19. DC Emission peak Power 20. DC Emission peak Resource Block Number 21. DC Emission peak Slot Number 22. General Emission (Average) 23. General Emission (max) 24. General Emission peak (Average) 25. General Emission peak (max) 26. General Emission peak Power 27. General Emission peak Resource Block Number 28. General Emission peak Slot Number

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
69	A/B	The Total EVM (Frequency Based) for each Slot is returned in the following comma-separated order. 1. Total EVM rms of 0th slot (Average) 2. Total EVM rms of 0th slot (max) 3. Total EVM peak of 0th slot (Average) 4. Total EVM peak of 0th slot (max) 5. Total EVM peak Symbol Number of 0th slot 6. Total EVM peak Subcarrier Number of 0th slot … 115. Total EVM rms of 19th slot (Average) 116. Total EVM rms of 19th slot (max) 117. Total EVM peak of 19th slot (Average) 118. Total EVM peak of 19th slot (max) 119. Total EVM peak Symbol Number of 19th slot 120. Total EVM peak Subcarrier Number of 19th slot ***Note:*** The measurement results are valid only when Target Channel is PUSCH/PUCCH. In other cases the measurements results as recorded as invalid.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
70	A/B	The Spectral Flatness numeric results are returned in the following comma-separated order. 1. inside Flatness (≥ 3 MHz) Avg. (Average) 2. inside Flatness (≥ 3 MHz) Avg. (max) 3. inside Flatness (≥ 3 MHz) Max. (Average) 4. inside Flatness (≥ 3 MHz) Max. (max) 5. inside Flatness (≥ 3 MHz) Max Subcarrier Number 6. inside Flatness (≥ 3 MHz) Max Slot Number 7. inside Flatness (≥ 3 MHz) Min.(Average) 8. inside Flatness (≥ 3 MHz) Min.(max) 9. inside Flatness (≥ 3 MHz) Min Subcarrier Number 10. inside Flatness (≥ 3 MHz) Min Slot Number 11. outside Flatness (< 3 MHz) Avg. (Average) 12. outside Flatness (< 3 MHz) Avg. (max) 13. outside Flatness (< 3 MHz) Max. (Average) 14. outside Flatness (< 3 MHz) Max. (max) 15. outside Flatness (< 3 MHz) Max Subcarrier Number 16. outside Flatness (< 3 MHz) Max Slot Number 17. outside Flatness (< 3 MHz) Min.(Average) 18. outside Flatness (< 3 MHz) Min.(max) 19. outside Flatness (< 3 MHz) Min Subcarrier Number 20. outside Flatness (< 3 MHz) Min Slot Number 21. inside Flatness (≥ 5 MHz) Avg. (Average) 22. inside Flatness (≥ 5 MHz) Avg. (max) 23. inside Flatness (≥ 5 MHz) Max. (Average) 24. inside Flatness (≥ 5 MHz) Max. (max) 25. inside Flatness (≥ 5 MHz) Max Subcarrier Number 26. inside Flatness (≥ 5 MHz) Max Slot Number 27. inside Flatness (≥ 5 MHz) Min.(Average) 28. inside Flatness (≥ 5 MHz) Min.(max) 29. inside Flatness (≥ 5 MHz) Min Subcarrier Number 30. inside Flatness (≥ 5 MHz) Min Slot Number 31. outside Flatness (< 5 MHz) Avg. (Average) 32. outside Flatness (< 5 MHz) Avg. (max) 33. outside Flatness (< 5 MHz) Max. (Average) 34. outside Flatness (< 5 MHz) Max. (max) 35. outside Flatness (< 5 MHz) Max Subcarrier Number

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
70	A/B	36. outside Flatness (< 5 MHz) Max Slot Number 37. outside Flatness (< 5 MHz) Min. (Average) 38. outside Flatness (< 5 MHz) Min. (max) 39. outside Flatness (< 5 MHz) Min Subcarrier Number 40. outside Flatness (< 5 MHz) Min Slot Number ***Note:*** If there no Inside or Outside measurement results due to the measurement frequency and OperatingBand relationship, the measurement results becomes –999. 9.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
71	A/B	Spectral Flatness (normal conditions) numeric results for each Slot Responses are returned with comma-separated value formats in the following order: 1. Inside Flatness Avg of 0th slot (Average) 2. Inside Flatness Avg of 0th slot (max) 3. Inside Flatness Max of 0th slot (Average) 4. Inside Flatness Max of 0th slot (max) 5. Inside Flatness Max Subcarrier Number of 0th slot 6. Inside Flatness Min of 0th slot (Average) 7. Inside Flatness Min of 0th slot (max) 8. Inside Flatness Min Subcarrier Number of 0th slot 9. Outside Flatness Avg of 0th slot (Average) 10. Outside Flatness Avg of 0th slot (max) 11. Outside Flatness Max of 0th slot (Average) 12. Outside Flatness Max of 0th slot (max) 13. Outside Flatness Max Subcarrier Number of 0th slot 14. Outside Flatness Min of 0th slot (Average) 15. Outside Flatness Min of 0th slot (max) 16. Outside Flatness Min Subcarrier Number of 0th slot … 305. Inside Flatness Avg of 19th slot (Average) 306. Inside Flatness Avg of 19th slot (max) 307. Inside Flatness Max of 19th slot (Average) 308. Inside Flatness Max of 19th slot (max) 309. Inside Flatness Max Subcarrier Number of 19th slot 310. Inside Flatness Min of 19th slot (Average) 311. Inside Flatness Min of 19th slot (max) 312. Inside Flatness Min Subcarrier Number of 19th slot 313. Outside Flatness Avg of 19th slot (Average) 314. Outside Flatness Avg of 19th slot (max) 315. Outside Flatness Max of 19th slot (Average) 316. Outside Flatness Max of 19th slot (max) 317. Outside Flatness Max Subcarrier Number of 19th slot

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
71	A/B	318. Outside Flatness Min of 19th slot (Average) 319. Outside Flatness Min of 19th slot (max) 320. Outside Flatness Min Subcarrier Number of 19th slot ***Note:*** If there no Inside or Outside measurement results due to the measurement frequency and OperatingBand relationship, the measurement results becomes –999. 9.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
72	A/B	Spectral Flatness (extreme conditions) numeric results for each Slot Same Response as n = 71
73	A/B	The General (Exclude IQ/DC) In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. General In-Band Emission of 0th slot (Average) 2. General In-Band Emission of 0th slot (max) 3. General In-Band Emission peak of 0th slot (Average) 4. General In-Band Emission peak of 0th slot (max) 5. General In-Band Emission peak Power of 0th slot 6. General In-Band Emission peak RB Number of 0th slot … 55. General In-Band Emission of 19th slot (Average) 56. General In-Band Emission of 19th slot (max) 57. General In-Band Emission peak of 19th slot (Average) 58. General In-Band Emission peak of 19th slot (max) 59. General In-Band Emission peak Power of 19th slot 60. General In-Band Emission peak RB Number of 19th slot
74	A/B	The IQ Image In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. IQ Image In-Band Emission of 0th slot (Average) 2. IQ Image In-Band Emission of 0th slot (max) 3. IQ Image In-Band Emission of 0th slot (Average) 4. IQ Image In-Band Emission peak of 0th slot (max) 5. IQ Image In-Band Emission peak Power of 0th slot (max) 6. IQ Image In-Band Emission peak RB Number of 0th slot … 55.IQ Image In-Band Emission of 19th slot (Average) 56.IQ Image In-Band Emission of 19th slot (max) 57.IQ Image In-Band Emission of 19th slot (Average) 58.IQ Image In-Band Emission peak of 19th slot (max) 59.IQ Image In-Band Emission peak Power of 19th slot (max) 60.IQ Image In-Band Emission peak RB Number of 19th slot

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
75	A/B	The DC In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. DC In-Band Emission of 0th slot (Average) 2. DC In-Band Emission of 0th slot (max) 3. DC In-Band Emission peak of 0th slot (Average) 4. DC In-Band Emission peak of 0th slot (max) 5. DC In-Band Emission peak Power of 0th slot 6. DC In-Band Emission peak RB Number of 0th slot … 55. DC In-Band Emission of 19th slot (Average) 56. DC In-Band Emission of 19th slot (max) 57. DC In-Band Emission peak of 19th slot (Average) 58. DC In-Band Emission peak of 19th slot (max) 59. DC In-Band Emission peak Power of 19th slot 60. DC In-Band Emission peak RB Number of 19th slot ***Note:*** When Target Channel is PRACH/SRS, an invalid value is recorded for measurement results.
76	A/B	The General In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. General In-Band Emission of 0th slot (Average) 2. General In-Band Emission of 0th slot (max) 3. General In-Band Emission peak of 0th slot (Average) 4. General In-Band Emission peak of 0th slot (max) 5. General In-Band Emission peak Power of 0th slot 6. General In-Band Emission peak RB Number of 0th slot … 55. General In-Band Emission of 19th slot (Average) 56. General In-Band Emission of 19th slot (max) 57. General In-Band Emission peak of 19th slot (Average) 58. General In-Band Emission peak of 19th slot (max) 59. General In-Band Emission peak Power of 19th slot 60. General In-Band Emission peak RB Number of 19th slot ***Note:*** When Target Channel is PRACH/SRS, an invalid value is recorded for measurement results.

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
79	A/B	The General(Exclude DC/IQ) In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. General In-Band Emission margin peak of 0th slot (Max) 2. General In-Band Emission RB Number of 0th slot 3. General In-Band Emission spec relative of 0th slot 4. General In-Band Emission spec parameter of 0th slot 5. General In-Band Emission spec value of 0th slot 6. P_RB of 0th slot … 115. General In-Band Emission margin peak of 19th slot (Max) 116. General In-Band Emission RB Number of 19th slot 117. General In-Band Emission spec relative of 19th slot 118. General In-Band Emission spec parameter of 19th slot 119. General In-Band Emission spec value of 19th slot 120. P_RB of 19th slot
80	A/B	The IQ Image In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. IQ Image In-Band Emission margin peak of 0th slot (Max) 2. IQ Image In-Band Emission RB Number of 0th slot 3. IQ Image In-Band Emission spec relative of 0th slot 4. IQ Image In-Band Emission spec parameter of 0th slot 5. IQ Image In-Band Emission spec value of 0th slot 6. P_RB of 0th slot … 115. IQ Image In-Band Emission margin peak of 19th slot (Max) 116. IQ Image In-Band Emission RB Number of 19th slot 117. IQ Image In-Band Emission spec relative of 19th slot 118. IQ Image In-Band Emission spec parameter of 19th slot 119. IQ Image In-Band Emission spec value of 19th slot 120. P_RB of 19th slot

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
81	A/B	The DC In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. DC In-Band Emission margin peak of 0th slot (Max) 2. DC In-Band Emission RB Number of 0th slot 3. DC In-Band Emission spec relative of 0th slot 4. DC In-Band Emission spec parameter of 0th slot 5. DC In-Band Emission spec value of 0th slot 6. P_RB of 0th slot … 115. DC In-Band Emission margin peak of 19th slot (Max) 116. DC In-Band Emission RB Number of 19th slot 117. DC In-Band Emission spec relative of 19th slot 118. DC In-Band Emission spec parameter of 19th slot 119. DC In-Band Emission spec value of 19th slot 120. P_RB of 19th slot
82	A/B	The General In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. General In-Band Emission margin peak of 0th slot (Max) 2. General In-Band Emission RB Number of 0th slot 3. General In-Band Emission spec relative of 0th slot 4. General In-Band Emission spec parameter of 0th slot 5. General In-Band Emission spec value of 0th slot 6. P_RB of 0th slot … 115. General In-Band Emission margin peak of 19th slot (Max) 116. General In-Band Emission RB Number of 19th slot 117. General In-Band Emission spec relative of 19th slot 118. General In-Band Emission spec parameter of 19th slot 119. General In-Band Emission spec value of 19th slot 120. P_RB of 19th slot

Table 2.7-2 Responses to Modulation Measurement Results (Cont'd)

n	Result Mode	Response
83	A/B	The In-Band Emission numeric results for each Slot are returned in the following comma-separated order. 1. In-band Emission Mask Line of RB 0 2. In-band Emission Mask Line of RB 1 … 120. In-band Emission Mask Line of RB N–1
84	A/B	Responses are returned with comma-separated value formats in the following order: 1. General (Exclude Carrier Leakage /IQ) Emission (Margin Peak) (Max) 2. General (Exclude Carrier Leakage /IQ) Emission (Margin Peak) Resource Block Number 3. General (Exclude Carrier Leakage /IQ) Emission (Margin Peak) Slot Number 4. –999.0 5. General (Exclude Carrier Leakage /IQ) Spec parameter 6. General (Exclude Carrier Leakage /IQ) Spec value 7. IQ Image Emission (Margin Peak) (Max) 8. IQ Image Emission (Margin Peak) Resource Block Number 9. IQ Image Emission (Margin Peak) Slot Number 10. –999 11. IQ Image Spec parameter 12. IQ Image Spec value 13. Carrier Leakage Emission (Margin Peak) (Max) 14. Carrier Leakage Emission (Margin Peak) Resource Block Number 15. Carrier Leakage Emission (Margin Peak) Slot Number 16. –999 17. Carrier Leakage Spec parameter 18. Carrier Leakage Spec value 19. General Emission (Margin Peak) (Max) 20. General Emission (Margin Peak) Resource Block Number 21. General Emission (Margin Peak) Slot Number 22. –999 23. General Spec parameter 24. General Spec value

For details on Result Mode, refer to the description of the `:SYSTem:RESult:MODE` command in the *MS2690A/MS2691A/MS2692A or MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual (Mainframe Remote Control)*.

Table 2.7-3 lists device messages on Parameter Setting for Modulation Measurement

Table 2.7-3 Device Messages for Setting Parameters for Modulation Measurement

Parameter	Device Messages
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|7|9|10:TRACe:Y[:SCALe]:SPACing LINear|LOGarithmic|PERCent|DB
	:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10:TRACe:Y[:SCALe]:SPACing?
Scale - EVM	:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel 2|5|10|20|-40|-20|0
	:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel?
Scale - Flatness	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel 10|3|1|0.3|0.1|60|20|6|500|100|50
	:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel?
Trace Mode	:DISPlay:EVM[:VIEW]:SELect EVSubcarrier|EVSYmbol|TBEvm|EVDemod|FLATness|SUMMary
	:DISPlay:EVM[:VIEW]:SELect?
Spectral Flatness Type	:CALCulate:EVM:WINDow4:TYPE AMPLitude|DAMPlitude|PHASe|GDELay
	:CALCulate:EVM:WINDow4:TYPE?
In-band Emission Type	:CALCulate:EVM:WINDow11:TYPE GI|DC
	:CALCulate:EVM:WINDow11:TYPE?

Table 2.7-3 Device Messages for Setting Parameters for Modulation Measurement (Cont'd)

Parameter	Device Messages
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:WINDow4:MODE EACH|AVERage
	:CALCulate:EVM:WINDow4:MODE?
	:CALCulate:EVM:WINDow4:GVIew RMS|RPEak
	:CALCulate:EVM:WINDow4:GVIew?
	:CALCulate:EVM:WINDow9:GVIew RMS|RPEak
	:CALCulate:EVM:WINDow9:GVIew?
	:CALCulate:EVM:WINDow10:MODE EACH|AVERage
	:CALCulate:EVM:WINDow10:MODE?
	:CALCulate:EVM:WINDow10:GVIew RMS|RPEak
	:CALCulate:EVM:WINDow10:GVIew?
	:CALCulate:EVM:WINDow11:MODE EACH|AVERage
	:CALCulate:EVM:WINDow11:MODE?
	:CALCulate:EVM:WINDow11:GVIew AVERage|APEak
	:CALCulate:EVM:WINDow11:GVIew?
	:CALCulate:EVM:WINDow11:GTYPe RB|SUBCarrier|BOTH
	:CALCulate:EVM:WINDow11:GTYPe?
Constellation Symbol Number	:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer>
	:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer?
Bottom Graph Symbol Number	:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer <integer>
	:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer?
EVM vs Symbol Subcarrier Number	:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer <integer>
	:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?
Bottom Graph Slot Number	:CALCulate:EVM:WINDow4|11:SLOT:NUMBer <integer>
	:CALCulate:EVM:WINDow4|11:SLOT:NUMBer?
Subframe Number (Remote Only)	:CALCulate:EVM:WINDow8:SUBFrame:NUMBer <integer>
	:CALCulate:EVM:WINDow8:SUBFrame:NUMBer?
Display Page	:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer>
	:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer?

Table 2.7-4 lists the device messages for setting the marker and reading out the value at the marker position for Modulation measurement.

Table 2.7-4 Device Messages Related to Marker for Modulation Measurement

Parameter	Device Messages
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:RB <integer>
	:CALCulate:EVM:MARKer:RB?
	:CALCulate:EVM:MARKer:DEModsymbol <integer>
	:CALCulate:EVM:MARKer:DEModsymbol?
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:RB:MARKer:Y?
	:CALCulate:EVM:RB:MARKer:Y:PEAK?
	:CALCulate:EVM:MARKer:Y:MAXimum?
	:CALCulate:EVM:MARKer:Y:MINimum?
	:CALCulate:EVM:RB:MARKer:Y:MAXimum?
	:CALCulate:EVM:RB:MARKer:Y:MINimum?
Peak Search	:CALCulate:MARKer:MAXimum
	:CALCulate:MARKer:MAXimum:NEXT
	:CALCulate:MARKer:MINimum
	:CALCulate:MARKer:MINimum:NEXT
Constellation Sequence Number	:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer <integer>
	:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer?
Bottom Graph Sequence Number	:CALCulate:EVM:WINDow2:PSEQuence:NUMBer <integer>
	:CALCulate:EVM:WINDow2:PSEQuence:NUMBer?

2.7.1 Measure

:CONFigure:EVM

Modulation

Function

This command selects the Modulation measurement function.

Command

```
:CONFigure:EVM
```

Details

No measurement is made.

Example of Use

To select the Modulation measurement function.

```
CONF:EVM
```

:INITiate:EVM

Modulation

Function

This command executes the Modulation measurement function.

Command

```
:INITiate:EVM
```

Example of Use

To execute the Modulation measurement.

```
INIT:EVM
```

:FETCh:EVM[n]?

Modulation Query

Function

This command queries the result of the Modulation measurement.

Query

```
:FETCh:EVM[n]?
```

Response

See Table 2.7-2. If n is 3 to 11, the number of responses to be returned depends on the settings.

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 Symbol

Number of responses when n = 9 or 11

N – 2

Number of responses when n = 13

14400 × 2+1

The value of the first response returns the number of PUSCH resource elements with valid measurement results, and the number of resource elements with valid measurement results can be obtained from the following expression.

Number of valid results of PUSCH
=12 × 12 × Number of RBs

The (Number of valid results of PUSCH × 2 + 1)th and subsequent responses return an unmeasured value.

Number of responses when n = 15

24000 × 2+1

The value of the first response returns the number of RSs with valid measurement results, and the number of RSs with valid measurement results can be obtained from the following expression.

Number of valid results of RS
=12 × 2 × Number of RBs × Measurement Interval

The (Number of valid results of RS × 2 + 1)th and subsequent responses return an unmeasured value.

Details

–999.0 is returned when no measurement is made or an error occurs.
Note, however, that "999999999999" is returned in the case of a Frequency Error.
The unit of the read EVM value depends on the setting of EVM Unit.
When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the result of the 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 2.7-2.

Details

–999.0 is returned when no measurement is made or an error occurs. Note, however, that "999999999999" is returned in the case of a Frequency Error.
The unit of the read EVM value depends on the setting of EVM Unit.
When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To perform single Modulation measurement and query the measured result.

```
READ:EVM?
```

Related Command

This command has the same function 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 2.7-2.

Details

–999.0 is returned when no measurement is made or an error occurs. Note, however, that "999999999999" is returned in the case of a Frequency Error.
The unit of the read EVM value depends on the setting of EVM Unit.

When Standard is LTE-A, this can be queried for each CC individually. To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To perform single Modulation measurement and query the measured result.

```
MEAS:EVM?
```

Related Command

This command has the same function as the following command.

```
READ:EVM[n]?
```

2.7.2 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 & Maximum

Details

When Capture Time is set to Manual, and Target Channel is PUSCH or PUCCH, the capture time length must be 2 frames or more to perform measurement in Storage mode.

When Capture Time is set to Manual, and Target Channel is PRACH, the capture time length must be 4 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 setting of the storage mode.

Query

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

Response

```
<mode>
```

Parameter

`<mode>`	Storage Mode
`0`	Off
`1`	Average
`2`	Average & Maximum

Example of Use

To query the setting of the storage mode.

```
EVM:AVER?
> 1
```

2.7.3 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 is Auto	
	2 to 9999	
	When Capture Time is Manual	
	2 to Capture Time Length/2	(When Target Channel is PRACH)
	2 to Capture Time Length/3	(When Target Channel is not PRACH, and Measurement is Power vs Time)
	2 to Capture Time Length	(Target Channel is not PRACH, and Measurement is Modulation Analysis)
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 is Auto
  - 2 to 9999
- When Capture Time is Manual
  - 2 to Capture Time Length/2 (When Target Channel is PRACH)
  - 2 to Capture Time Length/3 (When Target Channel is not PRACH, and Measurement is Power vs Time.)
  - 2 to Capture Time Length (Target Channel is not PRACH, and Measurement is Modulation Analysis.)

Resolution 1

Example of Use

To query the storage count.

```
EVM:AVER:COUN?
> 10
```

2.7.4 Scale - EVM Unit

:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10: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|7|9|10:TRACe:Y[:SCALe]:SPA
Cing <mode>
```

Parameter

<mode>	EVM Unit
LINear	% scale
LOGarithmic	dB scale
PERCent	% scale (Default)
DB	dB scale

Example of Use

To set the unit of EVM to dB scale.

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

:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10:TRACe:Y[:SCALe]:SPACing?

Scale - EVM Unit Query

Function

This command queries the scale unit for EVM.

Query

```
:DISPlay:EVM[:VIEW]:WINDow2|3|7|9|10:TRACe:Y[:SCALe]:SPA
Cing?
```

Response

```
<mode>
```

Parameter

<mode>	EVM Unit
PERC	% scale
DB	dB scale

Example of Use

To query the unit of EVM.

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

2.7.5 Scale - EVM

:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel 2|5|10|20|-40|-20|0

Scale - EVM

Function

This command sets the vertical axis scale of the EVM vs Subcarrier/EVM vs Symbol/Time Based EVM/EVM vs Demod-Symbol graph. The unit depends on the setting of EVM Unit.

Command

```
:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel <integer>
```

Parameter

`<integer>`	Range of vertical axis scale

When EVM Unit is set to %.

`2`	0 to 2%
`5`	0 to 5% (Default)
`10`	0 to 10%
`20`	0 to 20%

When EVM Unit is set to dB.

`-40`	–80 to –40 dB (Default)
`-20`	–80 to –20 dB
`0`	–80 to 0 dB

Details

The selectable arguments depend on the setting of EVM Unit.

Example of Use

To set the vertical axis scale of the result graph to 10%.

```
DISP:EVM:WIND2:TRAC:Y:RLEV 10
```

:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel?

Scale - EVM Query

Function

This command queries the vertical axis scale of the EVM vs Subcarrier/EVM vs Symbol/Time Based EVM/EVM vs Demod-Symbol graph. The unit of the readout value depends on the setting of the EVM Unit.

Query

```
:DISPlay:EVM[:VIEW]:WINDow2|3|9|10:TRACe:Y[:SCALe]:RLEVel?
```

Response

```
<integer>
```

Parameter

`<integer>`	Range of vertical axis scale

When EVM Unit is set to %.

`2`	0 to 2%
`5`	0 to 5%
`10`	0 to 10%
`20`	0 to 20%

When EVM Unit is set to dB.

`-40`	–80 to –40 dB
`-20`	–80 to –20 dB
`0`	–80 to 0 dB

Example of Use

To query the vertical axis scale of the result graph.

```
DISP:EVM:WIND2:TRAC:Y:RLEV?
> 10
```

2.7.6 Scale - Flatness

:DISPlay:EVM[:VIEW]:WINDow4:TRACe:Y[:SCALe]:RLEVel
10|3|1|0.3|0.1|60|20|6|500|100|50

Scale - Flatness

Function

This command sets the vertical scale of the Flatness graph. The unit depends on the setting of Spectral Flatness Type.

Command

```
:DISPlay:EVM:WINDow4:TRACe:Y[:SCALe]:RLEVel <integer>
```

Parameter

`<integer>`	Range of vertical axis scale
When Spectral Flatness Type = Amplitude	
`10`	–10 to +10 dB (Default)
`3`	–3 to +3 dB
`1`	–1 to +1 dB
When Spectral Flatness Type = Difference Amplitude	
`1`	–1 to +1 dB (Default)
`0.3`	–0.3 to +0.3 dB
`0.1`	–0.1 to +0.1 dB
When Spectral Flatness Type = Phase	
`60`	–60 to +60 degree (Default)
`20`	–20 to +20 degree
`6`	–6 to +6 degree
When Spectral Flatness Type = Group Delay	
`500`	–500 to 500 ns
`100`	–100 to 100 ns
`50`	–50 to +50 ns (Default)
`10`	–10 to +10 ns
`1`	–1 to +1 ns

Details

The selectable arguments depend on the setting of Spectral Flatness Type.
Note, however, that 10 can be set as an argument when Flatness Type is Amplitude or Group Delay, and 1 can be set when Flatness Type is Amplitude, Difference Amplitude or Group Delay.

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 scale of the Flatness graph. The unit of the readout value depends on the setting of the Spectral Flatness Type.

Query

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

Response

```
<integer>
```

Parameter

`<integer>`	Range of vertical axis scale
When Flatness Type = Amplitude	
`10`	–10 to +10 dB
`3`	–3 to +3 dB
`1`	–1 to +1 dB
When Flatness Type = Difference Amplitude	
`1`	–1 to +1 dB
`0.3`	–0.3 to +0.3 dB
`0.1`	–0.1 to +0.1 dB
When Flatness Type = Phase	
`60`	–60 to +60 degree
`20`	–20 to +20 degree
`6`	–6 to +6 degree
When Flatness Type = Group Delay	
`500`	–500 to +500 ns
`100`	–100 to +100 ns
`50`	–50 to +50 ns
`10`	–10 to +10 ns
`1`	–1 to +1 ns

Example of Use

To query the vertical axis scale of the result graph.

```
DISP:EVM:WIND4:TRAC:Y:RLEV?
> 10
```

2.7.7 Trace Mode

:DISPlay:EVM[:VIEW]:SELect EVSubcarrier|EVSYmbol|TBEvm|EVDemod|FLATness|IBEmission|SUMMary

Trace Mode

Function

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

Command

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

Parameter

<mode>	Result
EVSubcarrier	Displays EVM vs Subcarrier (Default)
EVSYmbol	Displays EVM vs Symbol
TBEVm	Displays Time Based EVM
EVDemod	Displays EVM vs Demod-Symbol
FLATness	Displays Spectral Flatness
IBEMission	Displays In-Band Emission
SUMMary	Displays Summary

When Target Channdel=PUSCH

EVM vs Subcarrier / EVM vs Symbol / Time Based EVM / EVM vs Demod-Symbol / Spectral Flatness / In-Band Emission / Summary are valid.

When Target Channdel=PUCCH

EVM vs Subcarrier / EVM vs Symbol / Spectral Flatness / In-Band Emission / Summary are valid.

When Target Channdel=PRACH

EVM vs Subcarrier / Spectral Flatness / Summary are valid.

When Target Channdel=SRS

EVM vs Subcarrier / Spectral Flatness / Summary are valid.

Details

Constellation is not displayed when Trace Mode is set to Summary.
The Marker function is invalid when Trace Mode is set to Summary.

Example of Use

To display Spectral Flatness in the graph window.

```
DISP:EVM:SEL FLAT
```

:DISPlay:EVM[:VIEW]:SELect?

Trace Mode Query

Function

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

Command

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

Response

```
<mode>
```

Parameter

<mode>	Result
EVS	Displays EVM vs Subcarrier
EVSY	Displays EVM vs Symbol
TBEV	Displays Time Based EVM
EVD	Displays EVM vs Demod-Symbol
FLAT	Displays Spectral Flatness
IBEM	Displays In-Band Emission
SUMM	Displays Summary

Example of Use

To query a graphical result in the graph window.

```
DISP:EVM:SEL?
> FLAT
```

2.7.8 Spectral Flatness Type

:CALCulate:EVM:WINDow4:TYPE AMPLitude|DAMPlitude|PHASe|GDELay

Spectral Flatness Type

Function

This command sets the Spectral Flatness graph display type.

Command

```
:CALCulate:EVM:WINDow4:TYPE <mode>
```

Parameter

<mode>	Display type of spectral flatness
AMPLitude	Amplitude (Default)
DAMPlitude	Difference Amplitude
PHASe	Phase
GDELay	Group Delay

Example of Use

To set the Spectral Flatness graph display type to Amplitude.

```
CALC:EVM:WIND4:TYPE AMPL
```

:CALCulate:EVM:WINDow4:TYPE?

Spectral Flatness Type Query

Function

This command queries the Spectral Flatness graph display type.

Query

```
:CALCulate:EVM:WINDow4:TYPE?
```

Response

```
<mode>
```

Parameter

<mode>	Display type of spectral flatness graph
AMPL	Amplitude
DAMP	Difference Amplitude
PHAS	Phase
GDEL	Group Delay

Example of Use

To query the Spectral Flatness graph display type.

```
CALC:EVM:WIND4:TYPE?
> AMPL
```

2.7.9 In-band Emission Type

:CALCulate:EVM:WINDow11:TYPE GI|DC

In-band Emission Type

Function

This command sets the In-Band Emission graph display type.

Command

```
:CALCulate:EVM:WINDow11:TYPE <mode>
```

Parameter

<mode>	Display type of In-band Emission
GI	Displays the graph for General & IQ Image (Default)
DC	Displays the graph for Carrier Leakage

Example of Use

To set the In-Band Emission graph display type to DC.

```
CALC:EVM:WIND11:TYPE DC
```

:CALCulate:EVM:WINDow11:TYPE?

In-band Emission Type Query

Function

This command queries the In-Band Emission graph display type.

Query

```
:CALCulate:EVM:WINDow11:TYPE?
```

Response

```
<mode>
```

Parameter

<mode>	Display type of In-band Emission
GI	Displays the graph for General & IQ Image
DC	Displays the graph for Carrier Leakage

Example of Use

To query the In-Band Emission graph display type.

```
CALC:EVM:WIND11:TYPE?
> DC
```

2.7.10 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

Target Channel = PUSCH

- `EACH` Unaveraged Each Symbol
- `AVERage` Averaged over all Symbols (Default)

Target Channel = PUCCH

- `EACH` Unaveraged Each Symbol (Default)

Target Channel = PRACH

PRACH Format 0, 1

- `EACH` Unaveraged Each Preamble Sequence (Default)

PRACH Format 2, 3

- `EACH` Unaveraged Each Preamble Sequence (Default)
- `AVERage` Averaged over all Symbols

Target Channel = SRS

- `EACH` Unaveraged Each Symbol
- `AVERage` Averaged over all Symbols (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 displayed EVM vs Subcarrier is averaged.

Query

```
:CALCulate:EVM:WINDow2:MODE?
```

Response

```
<mode>
```

Parameter

`<mode>` Averaging of EVM vs Subcarrier

Target Channel = PUSCH

- `EACH` Unaveraged Each Symbol
- `AVERage` Averaged over all Symbols

Target Channel = PUCCH

- `EACH` Unaveraged Each Symbol

Target Channel = PRACH

PRACH Format 0, 1

- `EACH` Unaveraged Each Preamble Sequence

PRACH Format 2, 3

- `EACH` Unaveraged Each Preamble Sequence
- `AVERage` Averaged over all Symbols

Target Channel = SRS

- `EACH` Unaveraged Each Symbol
- `AVERage` Averaged over all Symbols

Example of Use

To query whether the displayed 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 of EVM vs Subcarrier.

```
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`	Displays the average value.
`RPE`	Displays the average and peak values.

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	Displays the unaveraged EVM vs Symbol.
AVER	Displays the averaged EVM vs Symbol.

Example of Use

To query whether the displayed EVM vs Symbol is averaged.

```
CALC:EVM:WIND3:MODE?
> AVER
```

: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 EVM vs Symbol.

```
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`	Displays the average value.
`RPE`	Displays the average and peak values.

Example of Use

To query the display type of the EVM vs Symbol graph.

```
CALC:EVM:WIND3:GVI?
> RMS
```

:CALCulate:EVM:WINDow4:MODE EACH|AVERage

Spectral Flatness View

Function

This command sets whether to enable averaging for Spectral Flatness.

Command

```
:CALCulate:EVM:WINDow4:MODE <mode>
```

Parameter

<mode>	Averaging of Spectral Flatness
EACH	Displays unaveraged Spectral Flatness.
AVERage	Displays averaged Spectral Flatness (Default).

Example of Use

To display averaged Spectral Flatness.

```
CALC:EVM:WIND4:MODE AVER
```

:CALCulate:EVM:WINDow4:MODE?

Spectral Flatness View Query

Function

This command queries the Spectral Flatness averaging setting.

Query

```
:CALCulate:EVM:WINDow4:MODE?
```

Response

```
<mode>
```

Parameter

<mode>	Averaging of Spectral Flatness
EACH	Displays unaveraged Spectral Flatness.
AVER	Displays averaged Spectral Flatness.

Example of Use

To query the Spectral Flatness averaging setting.

```
CALC:EVM:WIND4:MODE?
> AVER
```

:CALCulate:EVM:WINDow4:GVIew RMS|RPEak

Spectral Flatness View Graph View

Function

This command sets the Spectral Flatness display type.

Command

```
:CALCulate:EVM:WINDow4:GVIew <mode>
```

Parameter

`<mode>`	Display type of Spectral Flatness graph
`RMS`	Displays the average value.
`RPEak`	Displays the average and peak values (Default).

Example of Use

To display averaged Spectral Flatness.

```
CALC:EVM:WIND4:GVI RMS
```

:CALCulate:EVM:WINDow4:GVIew?

Spectral Flatness View Graph View Query

Function

This command queries the Spectral Flatness display type.

Query

```
:CALCulate:EVM:WINDow4:GVIew?
```

Response

```
<mode>
```

Parameter

`<mode>`	Display type of Spectral Flatness graph
`RMS`	Displays the average value.
`RPE`	Displays the average and peak values.

Example of Use

To query the display type of the EVM vs Symbol graph.

```
CALC:EVM:WIND4:GVI?
> RMS
```

:CALCulate:EVM:WINDow9:GVIew RMS|RPEak

Time Based EVM View Graph View

Function

This command sets the display type for the Time Based EVM graph.

Command

```
:CALCulate:EVM:WINDow9:GVIew <mode>
```

Parameter

<mode>	Display type of Time Based EVM graph
RMS	Displays the average value.
RPEak	Displays the average and peak values (Default).

Example of Use

To display the average value of Time Based EVM.

```
CALC:EVM:WIND9:GVI RMS
```

:CALCulate:EVM:WINDow9:GVIew?

EVM vs Symbol View Graph View Query

Function

This command queries the display type for the Time Based EVM graph.

Query

```
:CALCulate:EVM:WINDow9:GVIew?
```

Response

```
<mode>
```

Parameter

<mode>	Display type of Time Based EVM graph
RMS	Displays the average value.
RPE	Displays the average and peak values.

Example of Use

To query the display type for the Time Based EVM graph.

```
CALC:EVM:WIND9:GVI?
> RMS
```

:CALCulate:EVM:WINDow10:MODE EACH|AVERage

EVM vs Demod-Symbol View

Function

This command sets whether the displayed EVM vs Demod-Symbol is averaged.

Command

```
:CALCulate:EVM:WINDow10:MODE <mode>
```

Parameter

`<mode>`	Averaging of EVM vs Demod-Symbol
`EACH`	Displays the unaveraged EVM vs Demod-Symbol.
`AVERage`	Displays the averaged EVM vs Demod-Symbol (Default).

Example of Use

To display the averaged EVM vs Demod-Symbol.

```
CALC:EVM:WIND10:MODE AVER
```

:CALCulate:EVM:WINDow10:MODE?

EVM vs Demod-Symbol View Query

Function

This command queries whether the displayed EVM vs Demod-Symbol is averaged.

Query

```
:CALCulate:EVM:WINDow10:MODE?
```

Response

```
<mode>
```

Parameter

`<mode>`	Averaging of EVM vs Demod-Symbol
`EACH`	Displays the unaveraged EVM vs Demod-Symbol.
`AVER`	Displays the averaged EVM vs Demod-Symbol.

Example of Use

To query whether the displayed EVM vs Demod-Symbol is averaged.

```
CALC:EVM:WIND10:MODE?
> AVER
```

:CALCulate:EVM:WINDow10:GVIew RMS|RPEak

EVM vs Demod-Symbol View Graph View

Function

This command sets the display type for the EVM vs Demod-Symbol graph.

Command

```
:CALCulate:EVM:WINDow10:GVIew <mode>
```

Parameter

<mode>	Display type of EVM vs Demod-Symbol graph
RMS	Displays the average value.
RPEak	Displays the average and peak values (Default).

Example of Use

To display the average value of EVM vs Demod-Symbol.

```
CALC:EVM:WIND10:GVI RMS
```

:CALCulate:EVM:WINDow10:GVIew?

EVM vs Demod-Symbol View Graph View Query

Function

This command queries the display type of the EVM vs Demod-Symbol graph.

Query

```
:CALCulate:EVM:WINDow10:GVIew?
```

Response

```
<mode>
```

Parameter

<mode>	Display type of EVM vs Demod-Symbol graph
RMS	Displays the average value.
RPE	Displays the average and peak values.

Example of Use

To query the display type of the EVM vs Demod-Symbol graph.

```
CALC:EVM:WIND10:GVI?
> RMS
```

:CALCulate:EVM:WINDow11:GVIew AVERage|APEak

In-band Emission View Graph View

Function

This command sets the In-Band Emission graph display type.

Command

```
:CALCulate:EVM:WINDow11:GVIew <mode>
```

Parameter

<mode>		Display type of In-Band Emission graph
	AVERage	Displays the average value.
	APEak	Displays the average and peak values (Default).

Example of Use

To display In-Band Emission average and peak value.

```
CALC:EVM:WIND11:GVI APE
```

:CALCulate:EVM:WINDow11:GVIew?

In-band Emission View Graph View Query

Function

This command queries the In-Band Emission graph display type.

Query

```
:CALCulate:EVM:WINDow11:GVIew?
```

Response

```
<mode>
```

Parameter

<mode>		Display type of In-Band Emission graph
	AVER	Displays the average value.
	APE	Displays the average and peak values.

Example of Use

To query the In-Band Emission graph display type.

```
CALC:EVM:WIND11:GVI?
> APE
```

:CALCulate:EVM:WINDow11:MODE EACH|AVERage

In-band Emission View

Function

This command sets whether to enable averaging for In-Band Emission.

Command

```
:CALCulate:EVM:WINDow11:MODE <mode>
```

Parameter

<mode>	Averaging of In-Band Emission
EACH	Displays In-Band Emission without averaging.
AVERage	Displays averaged In-Band Emission (Default)

Example of Use

To display averaged In-Band Emission

```
CALC:EVM:WIND11:MODE AVER
```

:CALCulate:EVM:WINDow11:MODE?

In-band Emission View Query

Function

This command queries the averaging status for In-Band Emission.

Query

```
:CALCulate:EVM:WINDow11:MODE?
```

Response

```
<mode>
```

Parameter

<mode>	Averaging of In-Band Emission
EACH	Displays In-Band Emission without averaging.
AVER	Displays averaged In-Band Emission

Example of Use

To query the averaging status for In-Band Emission.

```
CALC:EVM:WIND11:MODE?
> AVER
```

:CALCulate:EVM:WINDow11:GTYPe RB|SUBCarrier|BOTH

In-band Emission Graph Type

Function

This command sets the In-Band Emission graph display type.

Command

```
:CALCulate:EVM:WINDow11:GTYPe <type>
```

Parameter

`<type>`	Graph type
`RB`	RB Graph
`SUBCarrier`	Subcarrier Graph
`BOTH`	RB & Subcarrier (Default)

Example of Use

To set Graph Type of In-band Emission.

```
CALC:EVM:WIND11:GTYP RB
```

:CALCulate:EVM:WINDow11:GTYPe?

In-band Emission Graph Type Query

Function

This command queries the In-Band Emission graph display type.

Query

```
:CALCulate:EVM:WINDow11:GTYPe?
```

Response

```
<type>
```

Parameter

`<type>`	Graph type
`RB`	RB Graph
`SUBC`	Subcarrier Graph
`BOTH`	RB & Subcarrier

Example of Use

To query the In-Band Emission graph display type.

```
CALC:EVM:WIND11:GTYP?
> RB
```

2.7.11 Constellation Symbol Number

:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer>

Constellation Symbol Number

Function

This command sets the symbol number of the constellation displayed.

Command

```
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer <integer>
```

Parameter

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

Example of Use

To set the symbol number of the displayed Constellation to 110.

```
CALC:EVM:WIND:SYMB:NUMB 110
```

:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer?

Constellation Symbol Number Query

Function

This command queries the symbol number of the displayed Constellation.

Query

```
:CALCulate:EVM:WINDow[1]:SYMBol:NUMBer?
```

Response

```
<integer>
```

Parameter

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

Example of Use

To query the symbol number of the displayed Constellation.

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

2.7.12 Bottom Graph Symbol Number

:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer <integer>

Bottom Graph Symbol Number

Function

This command sets the symbol number of the displayed EVM vs Subcarrier/EVM vs Demod-Symbol.

Command

```
:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer <integer>
```

Parameter

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

Example of Use

To set the symbol number of the displayed EVM vs Subcarrier to 110.

```
CALC:EVM:WIND2:SYMB:NUMB 110
```

:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer?

Bottom Graph Symbol Number Query

Function

This command queries the symbol number of the displayed EVM vs Subcarrier/EVM vs Demod-Symbol.

Query

```
:CALCulate:EVM:WINDow2|10:SYMBol:NUMBer?
```

Response

```
<integer>
```

Parameter

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

Example of Use

To query the symbol number of the displayed EVM vs Subcarrier.

```
CALC:EVM:WIND2:SYMB:NUMB?
> 110
```

2.7.13 EVM vs Symbol Subcarrier Number

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

EVM vs Symbol Subcarrier Number

Function

This command sets the subcarrier number of the displayed EVM vs Symbol.

Command

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

Parameter

`<integer>`		Subcarrier number
	Range	0 to 1199 (Channel Bandwidth: 20 MHz) 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

Details

This command is available when EVM vs Symbol View is set to Each Subcarrier.

Example of Use

To set the subcarrier number of the displayed EVM vs Symbol to 110.

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

:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?

EVM vs Symbol Subcarrier Number Query

Function

This command queries the subcarrier number of the displayed EVM vs Symbol.

Query

```
:CALCulate:EVM:WINDow3:SUBCarrier:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`		Subcarrier number
	Range	0 to 1199 (Channel Bandwidth: 20 MHz) 0 to 899 (Channel Bandwidth: 15 MHz) 0 to 599 (Channel Bandwidth: 10 MHz) 0 to 299 (Channel Bandwidth: 5 MHz) 0 to 179 (Channel Bandwidth: 3 MHz) 0 to 71 (Channel Bandwidth: 1.4 MHz)
	Resolution	1

Example of Use

To query the subcarrier number of the displayed EVM vs Symbol.

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

2.7.14 Bottom Graph Slot Number

:CALCulate:EVM:WINDow4|11:SLOT:NUMBer <integer>

Bottom Graph Slot Number

Function

This command sets the Bottom Graph display Slot number.

Command

```
:CALCulate:EVM:WINDow4|11:SLOT:NUMBer <integer>
```

Parameter

<integer>		Display Slot Number
	Range	0 to Measurement Interval×2–1
	Resolution	1
	Suffix code	None
	Default	0

Details

This is enabled when Trace Mode is Spectral Flatness or In-band Emission and when their view is Each Slot.

Example of Use

To set the Spectral Flatness display Slot number to 4.

```
CALC:EVM:WIND4:SLOT:NUMB 4
```

:CALCulate:EVM:WINDow4|11:SLOT:NUMBer?

Bottom Graph Slot Number Query

Function

This command queries the Bottom Graph display Slot number.

Query

```
:CALCulate:EVM:WINDow4|11:SLOT:NUMBer?
```

Response

```
<integer>
```

Parameter

<integer>		Slot number
	Range	0 to Measurement Interval×2–1
	Resolution	1

Example of Use

To query the Bottom Graph display Slot number.

```
CALC:EVM:WIND4:SLOT:NUMB?
> 4
```

2.7.15 Subframe Number

:CALCulate:EVM:WINDow8:SUBFrame:NUMBer <integer>

Subframe Number (Remote only)

Function

This command sets the subframe number. The set value is used as a target subframe number for PUSCH constellation of `FETCh: EVM13?`

Command

```
:CALCulate:EVM:WINDow8:SUBFrame:NUMBer <integer>
```

Parameter

`<integer>`	Subframe number
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 1.

```
CALC:EVM:WIND8:SUBF:NUMB 1
```

:CALCulate:EVM:WINDow8:SUBFrame:NUMBer?

Subframe Number Query (Remote only)

Function

This command queries the subframe number.

Query

```
:CALCulate:EVM:WINDow8:SUBFrame:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`	Subframe number
Range	Starting Subframe Number to (Starting Subframe Number+Measurement Interval – 1)
Resolution	1

Example of Use

To query the subframe number.

```
CALC:EVM:WIND8:SUBF:NUMB?
> 1
```

2.7.16 Display Page

:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer>

Target Page Number

Function

This command sets the page number of the displayed Summary.

Command

```
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer <integer>
```

Parameter

<integer>	Page number	
Range	1 to 14	(When Target Channel = PUSCH)
	1 to 11	(When Target Channel = PUCCH)
	1 to 2	(When Target Channel = PRACH)
	1 to 6	(When Target Channel = SRS)
Resolution	1	
Suffix code	None	
Default	1	

Example of Use

To set the page number of the displayed 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 of the displayed Summary.

Query

```
:DISPlay:EVM[:VIEW]:WINDow7:PAGE:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`	Page number	
Range	1 to 14	(When Target Channel = PUSCH)
	1 to 11	(When Target Channel = PUCCH)
	1 to 2	(When Target Channel = PRACH)
	1 to 6	(When Target Channel = SRS)
Resolution	1	

Example of Use

To query the page number of the displayed Summary.

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

2.7.17 Marker - On/Off

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

Marker – On/Off

Function

This command sets whether to display the marker.

Command

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

Parameter

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

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 display On/Off state.

Query

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

Response

```
<switch>
```

Parameter

<switch>	Marker
0	Off
1	On

Example of Use

To query the marker display On/Off state.

```
CALC:EVM:MARK?
> 1
```

2.7.18 Active Trace

:CALCulate:EVM:MARKer:ACTive CONStellation|BOTTom

Active Trace

Function

This command sets the target graph of the marker.

Command

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

Parameter

<switch>	Target graph
CONStellation	Constellation
BOTTom	Graph window (Default)

Example of Use

To set the target graph of the marker to the Constellation.

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

:CALCulate:EVM:MARKer:ACTive?

Active Trace Query

Function

This command queries the target graph of the marker.

Query

```
:CALCulate:EVM:MARKer:ACTive?
```

Response

```
<mode>
```

Parameter

<mode>	Target graph
CONS	Constellation
BOTT	Graph window

Example of Use

To query the target graph of the marker.

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

2.7.19 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 When Target Channel = PUSCH, PUCCH, SRS

Constellation, EVM vs Subcarrier,
Spectral Flatness - Amplitude, Spectral Flatness - Phase

0 to 1199 (Channel Bandwidth 20 MHz)
0 to 899 (Channel Bandwidth 15 MHz)
0 to 599 (Channel Bandwidth 10 MHz)
0 to 299 (Channel Bandwidth 5 MHz)
0 to 179 (Channel Bandwidth 3 MHz)
0 to 71 (Channel Bandwidth 1.4 MHz)

Spectral Flatness - Difference Amplitude,
Spectral Flatness - 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)

When Target Channel = PRACH

Constellation

0 to 838 (PRACH Configuration index 0 to 47)
0 to 138 (PRACH Configuration index 0 to 138)

EVM vs Subcarrier

–592 to 1455

Resolution 1
Suffix code None
Default Minimum value in Range

Example of Use

To set the position of the marker on the Constellation to 100.

```
CALC:EVM:MARK:SUBC 100
```

:CALCulate:EVM:MARKer:SUBCarrier?

Marker Subcarrier Number Query

Function

This command queries the position of the marker on the Constellation or on the graph window, in subcarrier number. The target graph is set by Active Trace.

Command

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

Response

```
<integer>
```

Parameter

`<integer>` Subcarrier number

Range When Target Channel = PUSCH, PUCCH, SRS

Constellation, EVM vs Subcarrier,
Spectral Flatness - Amplitude, Spectral Flatness - Phase

- 0 to 1199 (Channel Bandwidth 20 MHz)
- 0 to 899 (Channel Bandwidth 15 MHz)
- 0 to 599 (Channel Bandwidth 10 MHz)
- 0 to 299 (Channel Bandwidth 5 MHz)
- 0 to 179 (Channel Bandwidth 3 MHz)
- 0 to 71 (Channel Bandwidth 1.4 MHz)

Spectral Flatness - Difference Amplitude,
Spectral Flatness - 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)

When Target Channel = PRACH

Constellation

- 0 to 838 (PRACH Configuration index 0 to 47)
- 0 to 138 (PRACH Configuration index 0 to 138)

EVM vs Subcarrier

- –592 to 1455

Resolution 1

Example of Use

To query the position of the marker on the Constellation in subcarrier number.

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

:CALCulate:EVM:MARKer:SYMBol <integer>

Marker Symbol Number

Function

This command sets the position of the marker on the EVM vs Symbol /Time Based EVM graph in symbol number.

Command

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

Parameter

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

Example of Use

To set the position of the marker on the EVM vs Symbol graph to 100.

```
CALC:EVM:MARK:SYMB 100
```

:CALCulate:EVM:MARKer:SYMBol?

Marker Symbol Number Query

Function

This command queries the position of the marker on the EVM vs Symbol /Time Based EVM graph in symbol number.

Command

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

Response

```
<integer>
```

Parameter

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

Example of Use

To query the position of the marker on the EVM vs Symbol graph.

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

:CALCulate:EVM:MARKer:RB <integer>

Marker Resource Block Number

Function

This command sets the In-Band Emission graph marker position as the resource block number.

Command

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

Parameter

`<integer>`		Resource block number
	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 In-Band Emission marker to 10.

```
CALC:EVM:MARK:RB 10
```

:CALCulate:EVM:MARKer:RB?

Marker Resource Block Number Query

Function

This command queries the In-Band Emission graph marker position as the resource block number.

Command

```
:CALCulate:EVM:MARKer:RB?
```

Response

```
<integer>
```

Parameter

`<integer>`		Resource block number
	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 In-Band Emission marker target.

```
CALC:EVM:MARK:RB?
> 10
```

:CALCulate:EVM:MARKer:DEModsymbol <integer>

Marker Demod Symbol Number

Function

This command sets the EVM vs Demod Symbol graph marker position as DemodSymbol number.

Command

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

Parameter

`<integer>`	Demod Symbol number	
Range	0 to 1199	(Channel Bandwidth 20 MHz)
	0 to 749	(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 DemodSYMBol marker target to 10.

```
CALC:EVM:MARK:DEM 10
```

:CALCulate:EVM:MARKer:DEModsymbol?

Marker Demod Symbol Number Query

Function

This command queries the EVM vs DemodSymbol graph marker position as DemodSymbol number.

Command

```
:CALCulate:EVM:MARKer:DEModsymbol?
```

Response

```
<integer>
```

Parameter

`<integer>`	Demod Symbol number	
Range	0 to 1199	(Channel Bandwidth 20 MHz)
	0 to 749	(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 EVM vs DemodSymbol marker target.

```
CALC:EVM:MARK:DEM?
> 10
```

2.7.20 Marker Value

:CALCulate:EVM:MARKer:X?

Marker X Axis Value Query

Function

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

Query

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

Response

```
<real>
```

Parameter

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

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

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 is set to Constellation:

Constellation	No unit

When Active Trace is graph window and Trace Mode is EVM vs Subcarrier/EVM vs Symbol/Time Based EVM/EVM vs Demod-Symbol

When EVM Unit is set to %:	Unit: %
When EVM Unit is set to dB:	Unit: dB

When Active Trace is graph window and Trace Mode is Spectral Flatness

Amplitude	Unit: dB
Difference Amplitude	Unit: dB
Phase	Unit: degree
Group Delay	Unit: ns

When In-Band Emission is selected for Trace Mode:

Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query the RMS value on the Y coordinate at the marker.

```
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 Trace Mode is EVM vs Subcarrier/EVM vs Symbol/Time Based EVM/EVM vs Demod-Symbol

When EVM Unit is set to %:	Unit: %
When EVM Unit is set to dB:	Unit: dB

When Spectral Flatness is selected for Trace Mode:

Amplitude	Unit: dB
Difference Amplitude	Unit: dB
Phase	Unit: degree
Group Delay	Unit: ns

When In-Band Emission is selected for Trace Mode:

Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query the peak value on the Y coordinate at the marker on the target graph.

```
CALC:EVM:MARK:Y:PEAK?
> –20.00
```

:CALCulate:EVM:MARKer:EVM[:RMS]?

Marker EVM Value (RMS) Query

Function

This command queries the RMS value of EVM at the marker position in the corresponding graph.

Query

```
:CALCulate:EVM:MARKer:EVM[:RMS]?
```

Response

```
<real>
```

Parameter

`<real>` RMS value at marker on target graph.

When EVM Unit is set to %: Unit: %

When EVM Unit is set to dB: Unit: dB

Details

Disabled when Trace Mode is Summary, Spectral Flatness, In-band Emission.

–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

Disabled when Trace Mode is Summary, Spectral Flatness, In-band Emission.

–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:RB:MARKer:Y?

Marker Y Axis Value Query

Function

This command queries the average of the Y-coordinate at the In-Band Emission graph resource block marker position. It is valid when In-Band Emission Graph Type is RB or Both.

Query

```
:CALCulate:EVM:RB:MARKer:Y?
```

Response

```
<real>
```

Parameter

`<real>`	Average of Y-coordinate at resource block marker position Unit: dB

Details

It is invalid when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

Read average of Y-coordinate at resource block marker position.

```
CALC:EVM:RB:MARK:Y?
> –20.00
```

:CALCulate:EVM:RB:MARKer:Y:PEAK?

Marker Y Axis Value (Peak) Query

Function

This command queries the Peak value of the Y-coordinate at the In-Band Emission graph resource block marker position. It is valid when In-Band Emission Graph Type is RB or Both.

Query

```
:CALCulate:EVM:RB:MARKer:Y:PEAK?
```

Response

```
<real>
```

Parameter

`<real>`	Peak value of Y-coordinate at resource block marker position Unit: dB

Details

It is invalid when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query Peak value of Y-coordinate at resource block marker position.

```
CALC:EVM:RB:MARK:Y:PEAK?
> –20.00
```

:CALCulate:EVM:MARKer:Y:MAXimum?

Marker Y Axis Value (Max) Query

Function

This command queries the Max value of the Y-coordinate at the graph marker position.

Query

```
:CALCulate:EVM:MARKer:Y:MAXimum?
```

Response

```
<real>
```

Parameter

`<real>` Max value on Y coordinate at maker on target graph

When Trace Mode is EVM vs Subcarrier/EVM vs Symbol/Time Based EVM/EVM vs Demod-Symbol

When EVM Unit is set to %: Unit: %

When EVM Unit is set to dB: Unit: dB

When Spectral Flatness is selected for Trace Mode:

Amplitude	Unit: dB
Difference Amplitude	Unit: dB
Phase	Unit: degree
Group Delay	Unit: ns

When In-Band Emission is selected for Trace Mode:

Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query the Max value on the Y coordinate at the marker.

```
CALC:EVM:MARK:Y:MAX?
> –20.00
```

:CALCulate:EVM:MARKer:Y:MINimum?

Marker Y Axis Value (Min) Query

Function

This function queries the Min value of the Y-coordinate at the graph window marker position.

Query

```
:CALCulate:EVM:MARKer:Y:MINimum?
```

Response

```
<real>
```

Parameter

`<real>` Min value on Y coordinate at maker on target graph

When Spectral Flatness is selected for Trace Mode:

Amplitude	Unit: dB
Difference Amplitude	Unit: dB
Phase	Unit: degree
Group Delay	Unit: ns

When In-Band Emission is selected for Trace Mode:
Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query the Min value on the Y coordinate at the marker.

```
CALC:EVM:MARK:Y:MIN?
> –20.00
```

:CALCulate:EVM:RB:MARKer:Y:MAXimum?

Marker Y Axis Value (Max) Query

Function

This command queries the Max value of the Y-coordinate at the In-Band Emission graph resource block marker position. It is valid when In-Band Emission Graph Type is RB, and Graph View is Average&Peak at Both.

Query

```
:CALCulate:EVM:RB:MARKer:Y:MAXimum?
```

Response

```
<real>
```

Parameter

`<real>`	Peak value of Y-coordinate at resource block marker position Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query average value of Y-coordinate at resource block marker position.

```
CALC:EVM:RB:MARK:Y:MAX?
> –20.00
```

:CALCulate:EVM:RB:MARKer:Y:MINimum?

Marker Y Axis Value (Min) Query

Function

This command queries the Min value of the Y-coordinate at the In-Band Emission graph resource block marker position. It is valid when In-Band Emission Graph Type is RB, and Graph View is Average&Peak at Both.

Query

```
:CALCulate:EVM:RB:MARKer:Y:MINimum?
```

Response

```
<real>
```

Parameter

`<real>`	Peak value of Y-coordinate at resource block marker position Unit: dB

Details

Disabled when Trace Mode is Summary.
–999.0 is returned when no measurement is made or an error occurs.

Example of Use

To query Min value of Y-coordinate at resource block marker position.

```
CALC:EVM:RB:MARK:Y:MIN?
> –20.00
```

2.7.21 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 to that point.

Command

```
:CALCulate:MARKer:MAXimum
```

Details

This function is available on the following traces:

- EVM vs Subcarrier
- EVM vs Symbol
- Time Based EVM
- EVM vs Demod-Symbol
- Spectral flatness
- In-Band Emission

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.

Details

Disabled when Trace Mode is Summary.

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 with a level 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
- Time Based EVM
- EVM vs Demod-Symbol
- Spectral flatness
- In-Band Emission

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.

Details

Disabled when Trace Mode is Summary.

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 to that point.

Command

```
:CALCulate:MARKer:MINimum
```

Details

This function can be set when the following trace is active.

- EVM vs Subcarrier
- EVM vs Symbol
- Time Based EVM
- EVM vs Demod-Symbol
- Spectral flatness
- In-Band Emission

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.

Details

Disabled when Trace Mode is Summary.

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 with a level larger than the current marker level.

Command

```
:CALCulate:MARKer:MINimum:NEXT
```

Details

This function can be set when the following trace is active.

- EVM vs Subcarrier
- EVM vs Symbol
- Time Based EVM
- EVM vs Demod-Symbol
- Spectral flatness
- In-Band Emission

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.

Details

Disabled when Trace Mode is Summary.

Example of Use

To move the marker to the next minimum point and query the marker value.

```
CALC:MARK:MIN:NEXT
*WAI
CALC:EVM:MARK:Y?
```

2.7.22 Constellation Sequence Number

:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer <integer>

Constellation Sequence Number

Function

This command sets the preamble sequence number of the displayed Constellation.

Command

```
:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer <integer>
```

Parameter

`<integer>`	Preamble sequence number	
Range	0	(PRACH Format0, 1)
	0 to 1	(PRACH Format2, 3)
Resolution	1	
Suffix code	None	
Default	0	

Example of Use

To set the preamble sequence number of the displayed Constellation to 0:

```
CALC:EVM:WIND:PSEQ:NUMB 0
```

:CALCulate:EVM:WINDow[1]:PSEQuence:NUMBer?

Constellation Sequence Number Query

Function

This command queries the preamble sequence number of the displayed Constellation.

Query

```
:CALCulate:EVM:WINDow[1]: PSEQuence:NUMBer?
```

Response

```
<integer>
```

Parameter

`<integer>`	Preamble sequence number	
Range	0	(PRACH Format0, 1)
	0 to 1	(PRACH Format2, 3)
Resolution	1	

Example of Use

To query the preamble sequence number of the displayed Constellation :

```
CALC:EVM:WIND:PSEQ:NUMB?
> 0
```

2.7.23 Bottom Graph Sequence Number

:CALCulate:EVM:WINDow2:PSEQuence:NUMBer <integer>

Bottom Graph Sequence Number

Function

This command sets the preamble sequence number of the displayed EVM vs Subcarrier.

Command

```
:CALCulate:EVM:WINDow2:PSEQuence:NUMBer <integer>
```

Parameter

<integer>	Preamble sequence number	
Range	0	(PRACH Format0, 1)
	0 to 1	(PRACH Format2, 3)
Resolution	1	
Suffix code	None	
Default	0	

Example of Use

To set the preamble sequence number of the displayed EVM vs Subcarrier to 0:

```
CALC:EVM:WIND2:PSEQ:NUMB 0
```

:CALCulate:EVM:WINDow2: PSEQuence:NUMBer?

Bottom Graph Sequence Number Query

Function

This command queries the preamble sequence number of the displayed EVM vs Subcarrier.

Query

```
:CALCulate:EVM:WINDow2: PSEQuence:NUMBer?
```

Response

```
<integer>
```

Parameter

<integer>	Preamble sequence number	
Range	0	(PRACH Format0, 1)
	0 to 1	(PRACH Format2, 3)
Resolution	1	

Example of Use

To read the preamble sequence number of the displayed EVM vs Subcarrier:

```
CALC:EVM:WIND2:PSEQ:NUMB?
> 0
```

2.8 Power vs Time Measurement Function

This section describes device messages for Power vs Time measurement.

Table 2.8-1 lists device messages for executing Power vs Time measurement and querying the result.

Table 2.8-1 Power vs Time Measurement Function

Function	Device Messages
Configure	`:CONFigure:PVTime`
Initiate	`:INITiate:PVTime`
Fetch	`:FETCh:PVTime[n]?`
Read/Measure	`:READ:PVTime[n]?`
	`:MEASure:PVTime[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 Power vs Time Measurement Results

n	Result Mode	Response
1 or omitted	A/B	The Power numeric results for each Subframe are returned in the following comma-separated order. 1. Subframe #0 Power (Average) 2. Subframe #0 Power (Max) 3. Subframe #0 Power (Min) 4. Subframe #1 Power (Average) 5. Subframe #1 Power (Max) 6. Subframe #1 Power (Min) … 61. Subframe #20 Power (Average) 62. Subframe #20 Power (Max) 63. Subframe #20 Power (Min) ***Note:*** The data of SRS On Power is saved in memory in SRS measurement.
2	A/B	The (Excluding Transient Period) Power numeric results for each Subframe are returned in the following comma-separated order. 1. Subframe #0 (Excluding Transient Period) Power (Average) 2. Subframe #0 (Excluding Transient Period) Power (Max) 3. Subframe #0 (Excluding Transient Period) Power (Min) 4. Subframe #1 (Excluding Transient Period) Power (Average) 5. Subframe #1 (Excluding Transient Period) Power (Max) 6. Subframe #1 (Excluding Transient Period) Power (Min) … 61. Subframe #20 (Excluding Transient Period) Power (Average) 62. Subframe #20 (Excluding Transient Period) Power (Max) 63. Subframe #20 (Excluding Transient Period) Power (Min) ***Note:*** The data of Off Power before SRS is saved in memory in SRS measurement.

Table 2.8-2 Responses to Power vs Time Measurement Results (Cont'd)

n	Result Mode	Response
3	A/B	Responses are returned with comma-separated value formats in the following order: 1. PRACH On Power (Average) 2. PRACH On Power (Max) 3. PRACH On Power (Min) 4. Off Power before PRACH (Average) 5. Off Power before PRACH (Max) 6. Off Power before PRACH (Min) 7. Off Power after PRACH (Average) 8. Off Power after PRACH (Max) 9. Off Power after PRACH (Min)
31	A/B	The Power numeric results for each Sample Point are returned in the following comma-separated order. 1. Sample Point #0 Power (Average) 2. Sample Point #1 Power (Average) 3. Sample Point #2 Power (Average) … 709631. Sample Point #709630 Power (Average) 709632. Sample Point #709631 Power (Average) ***Note:*** PvT waveform at every sample point of Ts resolution (30.72 Msps). Sample Point #0 is 1 ms + 50 µs (= 32256 [Ts]) ahead from the frame head. (For PRACH, 1 ms + 50 µs ahead of PRACH burst)

Table 2.8-2 Responses to Power vs Time Measurement Results (Cont'd)

n	Result Mode	Response
32	A/B	The Power numeric results for each Sample Point are returned in the following comma-separated order. 1. Sample Point #0 Power (Maximum) 2. Sample Point #1 Power (Maximum) 3. Sample Point #2 Power (Maximum) … 709631. Sample Point #709630 Power (Maximum) 709632. Sample Point #709631 Power (Maximum) ***Note:*** PvT waveform at every sample point of Ts resolution (30.72 Msps). Sample Point #0 is 1 ms + 50 µs (= 32256 [Ts]) ahead from the frame head. (For PRACH, 1 ms + 50 µs ahead of PRACH burst)
33	A/B	The Power numeric results for each Sample Point are returned in the following comma-separated order. 1. Sample Point #0 Power (Minimum) 2. Sample Point #1 Power (Minimum) 3. Sample Point #2 Power (Minimum) … 709631. Sample Point #709630 Power (Minimum) 709632. Sample Point #709631 Power (Minimum) ***Note:*** PvT waveform at every sample point of Ts resolution (30.72 Msps). Sample Point #0 is 1 ms + 50 µs (= 32256 [Ts]) ahead from the frame head. (For PRACH, 1 ms + 50 µs ahead of PRACH burst)

Table 2.8-3 lists device messages on Parameter Setting for Power vs Time Measurement

Table 2.8-3 Device Messages for Setting Parameters for Modulation Measurement

Parameter	Device Messages
Storage Mode	[:SENSe]:PVTime:AVERage[:STATe] OFF|ON|0|1
	[:SENSe]:PVTime:AVERage[:STATe]?
Storage Count	[:SENSe]:PVTime:AVERage:COUNt <integer>
	[:SENSe]:PVTime:AVERage:COUNt?
Trace Mode	: DISPlay:PVTime[:VIEW]:SELect BURSt|TRANsient|NOGRaph
	:DISPlay:PVTime[:VIEW]:SELect?
Reference Level Upper - Burst / Transient	:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer <integer>
	:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer?
Reference Level Lower - Burst / Transient	:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer <integer>
	:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer?
Burst / Transient - Subframe Number	:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer <integer>
	:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer?
Marker - On/Off	:CALCulate:PVTime:MARKer[:STATe] OFF|ON|0|1
	:CALCulate:PVTime:MARKer[:STATe]?
Marker - Ts Number	:CALCulate:PVTime:MARKer:TS <integer>
	:CALCulate:PVTime:MARKer:TS?
Peak Search	:CALCulate:MARKer:MAXimum
	:CALCulate:MARKer:MAXimum:NEXT
	:CALCulate:MARKer:MINimum
	:CALCulate:MARKer:MINimum:NEXT

2.8.1 Power vs Time

:CONFigure:PVTime

Power vs Time

Function

This command selects the Power vs Time measurement function.

Command

```
:CONFigure:PVTime
```

Details

No measurement is made.

Example of Use

To select the Modulation measurement function.

```
CONF:PVT
```

:INITiate:PVTime

Power vs Time

Function

This command executes the Power vs Time measurement function.

Command

```
:INITiate:PVTime
```

Example of Use

To execute the Power vs Time measurement.

```
INIT:PVT
```

:FETCh:PVTime[n]?

Power vs Time Query

Function

This command queries the result of the Power vs Time measurement.

Query

```
:FETCh:PVTime[n]?
```

Response

See Table 2.8-2.

Details

–999.0 is returned when no measurement is made or an error occurs.
The unit of the read EVM value depends on the setting of EVM Unit.

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the result of the Power vs Time measurement.

```
FETC:PVT?
> 0.20,1.03,1,0.53,0.3,0.3,0.34,...
```

:READ:PVTime[n]?

Power vs Time Query

Function

This command performs Power vs Time measurement once (single measurement) with the current settings, and then queries the measured result.

Query

```
:READ:PVTime[n]?
```

Response

See Table 2.8-2.

Details

–999.0 is returned when no measurement is made or an error occurs.
The unit of the read EVM value depends on the setting of EVM Unit.

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To perform single Power vs Time measurement and query the measured result.

```
READ:PVT?
```

Related Command

This command has the same function as the following command.

```
:MEASure:PVTime[n]?
```

:MEASure:PVTime[n]?

Power vs Time Query

Function

This command performs Power vs Time measurement once (single measurement) with the current settings, and then queries the measured result.

Query

```
:MEASure:PVTime[n]?
```

Response

See Table 2.8-2.

Details

–999.0 is returned when no measurement is made or an error occurs.
The unit of the read EVM value depends on the setting of EVM Unit.

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To perform single Power vs Time measurement and query the measured result.

```
MEAS:PVT?
```

Related Command

This command has the same function as the following command.

```
:READ:PVTime[n]?
```

2.8.2 Storage Mode

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

Storage Mode

Function

This command sets the storage mode.

Command

```
[:SENSe]:PVTime:AVERage[:STATe] <mode>
```

Parameter

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

Example of Use

To set the storage mode to Average.

```
PVT:AVER ON
```

[:SENSe]:PVTime:AVERage[:STATe]?

Storage Mode Query

Function

This command queries the setting of the storage mode.

Query

```
[:SENSe]:PVTime:AVERage[:STATe]?
```

Response

```
<mode>
```

Parameter

<mode>	Storage Mode
0	Off
1	On

Example of Use

To query the setting of the storage mode.

```
PVT:AVER?
> 1
```

2.8.3 Storage Count

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

Storage Count

Function

This command sets the storage count.

Command

```
[:SENSe]:PVTime:AVERage:COUNt <integer>
```

Parameter

`<integer>` Storage Count

Range
- When Capture Time is Auto
  - 2 to 9999
- When Capture Time is Manual
  - 2 to Capture Time Length/2 (When Target Channel is PRACH)
  - 2 to Capture Time Length/3 (When Target Channel is not PRACH, and Measurement is Power vs Time.)
  - 2 to Capture Time Length (Target Channel is not PRACH,and Measurement is Modulation Analysis.)

Resolution 1

Default 10

Example of Use

To set the storage count to 10

```
PVT:AVER:COUN 10
```

[:SENSe]:PVTime:AVERage:COUNt?

Storage Count Query

Function

This command queries the storage count.

Query

```
[:SENSe]:PVTime:AVERage:COUNt?
```

Response

```
<integer>
```

Parameter

`<integer>` Storage Count

Range
When Capture Time is Auto
2 to 9999
When Capture Time is Manual
2 to Capture Time Length/2
(When Target Channel is PRACH)
2 to Capture Time Length/3
(When Target Channel is not PRACH, and Measurement is Power vs Time.)
2 to Capture Time Length
(Target Channel is not PRACH,and Measurement is Modulation Analysis.)

Resolution 1

Example of Use

To query the storage count.

```
PVT:AVER:COUN?
> 10
```

2.8.4 Trace Mode

:DISPlay:PVTime[:VIEW]:SELect BURSt|TRANsient|NOGRaph

Trace Mode

Function

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

Command

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

Parameter

<mode>	Trace Mode
BURSt	Burst (Default)
TRANsient	Transient
NOGRaph	No Graph (The graph is not displayed.)

Example of Use

To set the Trace mode to Burst.

```
DISP:PVT:SEL BURS
```

:DISPlay:PVTime[:VIEW]:SELect?

Trace Mode Query

Function

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

Query

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

Response

```
<mode>
```

Parameter

<mode>	Trace Mode
BURS	Burst
TRAN	Transient
NOGR	No Graph (The graph is not displayed.)

Example of Use

To query the setting of Trace mode.

```
DISP:PVT:SEL?
> BURS
```

2.8.5 Reference Level Upper - Burst / Transient

:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer <integer>

Reference Level Upper - Burst / Transient

Function

This command sets the upper end of the vertical scale in the Burst / Transient graph in Power vs Time measurement.

Command

```
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer <integer>
```

Parameter

`<integer>`	Reference Level Upper
Range	(–100 + Level Offset) to (50 + Level Offset) This can be set as long as Reference Level Upper is bigger than Reference Level Lower.
Resolution	1
Suffix code	`DBM` dBm when omitted
Default	20

Example of Use

To set the upper end value in the graph to 20.

```
DISP:PVT:WIND1:TRAC:Y:RLEV:UPP 20
```

:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer?

Reference Level Upper - Burst / Transient Query

Function

This command queries the upper end of the vertical scale in the Burst / Transient graph in Power vs Time measurement.

Query

```
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:UPPer?
```

Response

```
<integer>
```

Parameter

`<integer>`		Reference Level Upper
	Range	(–100 + Level Offset) to (50 + Level Offset)
	Resolution	1

Example of Use

To query the upper end value of the vertical scale in the graph.

```
DISP:PVT:WIND1:TRAC:Y:RLEV:UPP?
> 20
```

2.8.6 Reference Level Lower - Burst / Transient

:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer <integer>

Reference Level Lower - Burst / Transient

Function

This command sets the lower end of the vertical scale in the Burst / Transient graph in Power vs Time measurement.

Command

```
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer <integer>
```

Parameter

`<integer>`		Reference Level Lower
	Range	(–100 + Level Offset) to (50 + Level Offset) This can be set as long as Reference Level Upper is bigger than Reference Level Lower.
	Resolution	1
	Suffix code	`DBM` dBm when omitted
	Default	–80

Example of Use

To set the lower end value of the vertical scale in the graph to –80.

```
DISP:PVT:WIND1:TRAC:Y:RLEV:LOW -80
```

:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer?

Reference Level Lower - Burst / Transient Query

Function

This command queries the lower end of the vertical scale in the Burst / Transient graph in Power vs Time measurement.

Query

```
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer?
```

Response

```
<integer>
```

Parameter

`<integer>`		Reference Level Lower
	Range	(–100 + Level Offset) to (50 + Level Offset)
	Resolution	1

Example of Use

To query the lower end value of the vertical scale in the graph.

```
DISP:PVT:WIND1:TRAC:Y:RLEV:LOW?
> -80
```

2.8.7 Burst / Transient - Subframe Number

:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer <integer>

Burst / Transient - Subframe Number

Function

This command sets the subframe number to plot in the graph center in Power vs Time measurement. This is available when Target Channel is PUSCH/PUCCH/SRS.

Command

```
:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer <integer>
```

Parameter

<integer>	Subframe Number
Range	0 to 20
Resoluton	1
Default	2

Example of Use

To set the subframe number to plot in the graph center to 2.

```
CALC:PVT:WIND1:SUBF:NUMB 2
```

:CALCulate:PVTime:WINDow[1]|2:SUBFrame:NUMBer?

Burst / Transient - Subframe Number Query

Function

This command queries the subframe number to plot in the graph center in Power vs Time measurement.

Query

```
:DISPlay:PVTime[:VIEW]:WINDow[1]|2:TRACe:Y[:SCALe]:RLEVel:LOWer?
```

Response

```
<integer>
```

Parameter

<integer>	Subframe Number
Range	0 to 20
Resolution	1

Example of Use

To query the subframe number to plot in the graph center.

```
CALC:PVT:WIND1:SUBF:NUMB?
> 2
```

2.8.8 Marker - On/Off

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

Marker - On/Off

Function

This command sets whether to display the marker on Power vs Time Measurement.

Command

```
:CALCulate:PVTime:MARKer[:STATe] <switch>
```

Parameter

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

Example of Use

To display the marker on Power vs Time Measurement.

```
CALC:PVT:MARK 1
```

:CALCulate:PVTime:MARKer[:STATe]?

Marker - On/Off Query

Function

This command queries the marker display On/Off state on Power vs Time Measurement.

Query

```
:CALCulate:PVTime:MARKer[:STATe]?
```

Response

```
<switch>
```

Parameter

<switch>	Marker
0	Off
1	On

Example of Use

To query the marker display On/Off state on Power vs Time Measurement.

```
CALC:PVT:MARK?
> 1
```

2.8.9 Marker - Ts Number

:CALCulate:PVTime:MARKer:TS <integer>

Marker - Ts Number

Function

This command sets the marker position in Ts unit (sample number calculated by Sampling Rate of 30.72 MHz) in the Burst / Transient graph in Power vs Time measurement.

Command

```
:CALCulate:PVTime:MARKer:TS <integer>
```

Parameter

<integer>		Marker position
	Range	–32256 to 677375 Ts
	Resolution	1
	Default	When Target Channel=PUSCH/PUCCH/SRS, it is the same as the minimum value of the selected subframe.
		When Target Channel=PRACH 0

Details

The above range varies according to Trace Mode and Subframe Number settings.

Example of Use

To set the graph marker position to 0 in Power vs Time measurement.

```
CALC:PVT:MARK:TS 0
```

:CALCulate:PVTime:MARKer:TS?

Marker - Ts Number Query

Function

This command queries the marker position in Ts unit (sample number calculated by Sampling Rate of 30.72 MHz) in the Burst / Transient graph in Power vs Time measurement.

Query

```
:CALCulate:PVTime:MARKer:TS?
```

Response

```
<integer>
```

Parameter

`<integer>`	Marker position
Range	–32256 to 677375 Ts
Resolution	1

Example of Use

To query the graph marker position in Power vs Time measurement.

```
CALC:PVT:MARK:TS?
> 0
```

2.8.10 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 to that point.

Command

```
:CALCulate:MARKer:MAXimum
```

Details

This function is available on the following traces:

- Burst
- Transient

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 with a level lower than the current marker level.

Command

```
:CALCulate:MARKer:MAXimum:NEXT
```

Details

This function is available on the following traces:

- Burst
- Transient

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 to that point.

Command

```
:CALCulate:MARKer:MINimum
```

Details

This function can be set when the following trace is active.

- Burst
- Transient

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 with a level larger than the current marker level.

Command

```
:CALCulate:MARKer:MINimum:NEXT
```

Details

This function can be set when the following trace is active.

- Burst
- Transient

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 point and query the marker value.

```
CALC:MARK:MIN:NEXT
*WAI
CALC:EVM:MARK:Y?
```

2.9 Measurement Result Saving Function

Table 2.9-1 lists device messages for saving measurement results.

Table 2.9-1 Measurement Result Saving Function

Function	Device Messages
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 file name Character string within 32 characters enclosed by double quotes (“ ”) or single quotes (‘ ’) The following characters cannot be used: `\ / : * ? “ ” ‘ ’ < > |` Automatically named “LTEUL date_sequential number.xml” LTEUL20080617_00. xml
`<device>`	Drive name `D,E,F,...` D drive is used when omitted.

Details

A number from 00 to 99 is sequentially affixed to the name if the file name is omitted. No more files can be saved if numbers up to 99 are already used.

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

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

Up to 1000 files can be saved in a folder.

When Standard is LTE-A, the measurement results of each CC can be saved individually. To change the CC to save, edit Setting/Result Target CC#.

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 sets the type of file to save.

Command

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

Parameter

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

Details

When Standard is LTE-A, this can be set for each CC individually.
To change the CC to set, edit Setting/Result Target CC#.

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

Details

When Standard is LTE-A, this can be queried for each CC individually.
To change the CC to query, edit Setting/Result Target CC#.

Example of Use

To query the type of the file to be saved.

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

2.10 Replay Function

Table 2.10-1 lists device messages for setting the Replay function.

Table 2.10-1 Device messages for Replay function

Function	Device Messages
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 D,E,F,...
<application>	Application to load IQ data file
3GLTE_UL	LTE Uplink measurement software
SIGANA	Signal Analyzer

Details

The span value during replay is fixed to the span of the waveform data.
Replaying the 62.5 MHz or 125 MHz waveform is available when MX269021A-001 is installed.
When replaying the waveform of 62.5 MHz or 125 MHz span, Standard is fixed to LTE-A.

Example of Use

To load the IQ data file named TEST in D drive and to execute the Replay function.

```
MMEM:LOAD:IQD "TEST",D,3GLTE_UL
```

: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 ns No suffix code. Value is returned in s units. –999999999999 is returned when the Replay function is not 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

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.

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 `D,E,F,...` *** is returned when the Replay function is not 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_UL`	LTE Uplink measurement software *** is returned when the Replay function is not 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>	Displayed
1	Level Over is displayed
0	Normal
	–999. 0 is returned when the Replay function is not 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>	Displayed
1	Replay Error Info. icon is displayed.
0	Normal
	–999. 0 is returned when the Replay function is not executed.

Details

The Replay Error Info. icon is displayed if the loaded xml file contains error information.

Example of Use

To query whether the Replay Error Info. icon is displayed while the Replay function is executed.

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

:MMEMory:LOAD:IQData:INFormation:CORRection?

Replay Correction Query

Function

This 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.

Example of Use

To query the Correction value while the Replay function is executed.

```
MMEM:LOAD:IQD:INF:CORR?
> 0.000
```

: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.

Example of Use

To query the frequency reference signal source when the Replay function is executed.

```
MMEM:LOAD:IQD:INF:ROSC?
> INT
```

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 3-2
:STATus:ERRor? 3-2
3.2 STATus:QUEStionable Register 3-3
:STATus:QUEStionable[:EVENt]? 3-5
:STATus:QUEStionable:CONDition? 3-5
:STATus:QUEStionable:ENABle <integer> 3-6
:STATus:QUEStionable:ENABle? 3-6
:STATus:QUEStionable:NTRansition <integer> 3-7
:STATus:QUEStionable:NTRansition? 3-7
:STATus:QUEStionable:PTRansition <integer> 3-8
:STATus:QUEStionable:PTRansition? 3-8
:STATus:QUEStionable:MEASure[:EVENt]? 3-9
:STATus:QUEStionable:MEASure:CONDition? 3-9
:STATus:QUEStionable:MEASure:ENABle <integer> 3-10
:STATus:QUEStionable:MEASure:ENABle? 3-10
:STATus:QUEStionable:MEASure:NTRansition <integer> 3-11
:STATus:QUEStionable:MEASure:NTRansition? 3-11
:STATus:QUEStionable:MEASure:PTRansition <integer> 3-12
:STATus:QUEStionable:MEASure:PTRansition? 3-12
3.3 STATus:OPERation Register 3-13
:STATus:OPERation[:EVENt]? 3-14
:STATus:OPERation:CONDition? 3-14
:STATus:OPERation:ENABle <integer> 3-15
:STATus:OPERation:ENABle? 3-15
:STATus:OPERation:NTRansition <integer> 3-16
:STATus:OPERation:NTRansition? 3-16
:STATus:OPERation:PTRansition <integer> 3-17
:STATus:OPERation:PTRansition? 3-17

3.1 Reading Measurement Status

:STATus:ERRor?

Measurement Status Error Query

Function

Queries 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

Queries 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.

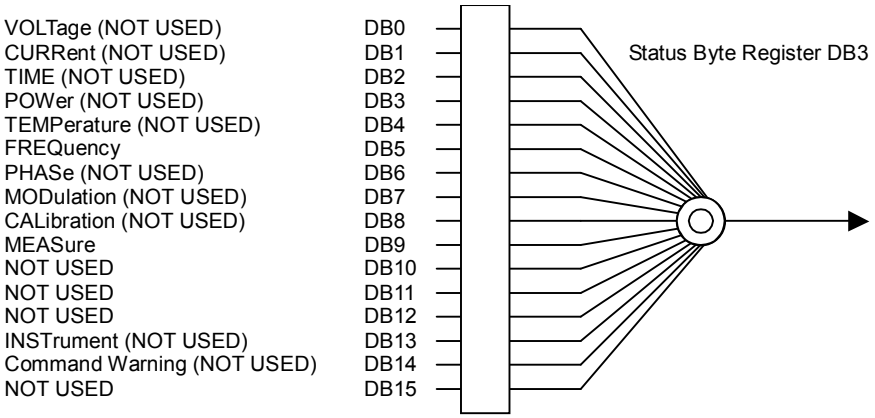


Figure 3.2-1 QUEStionable Status Register

Table 3.2-1 Bit Definition of QUEStionable Status Register

Bit	Definition
DB5	Reference Clock Unlock
DB9	QUEStionable Measure Register Summary

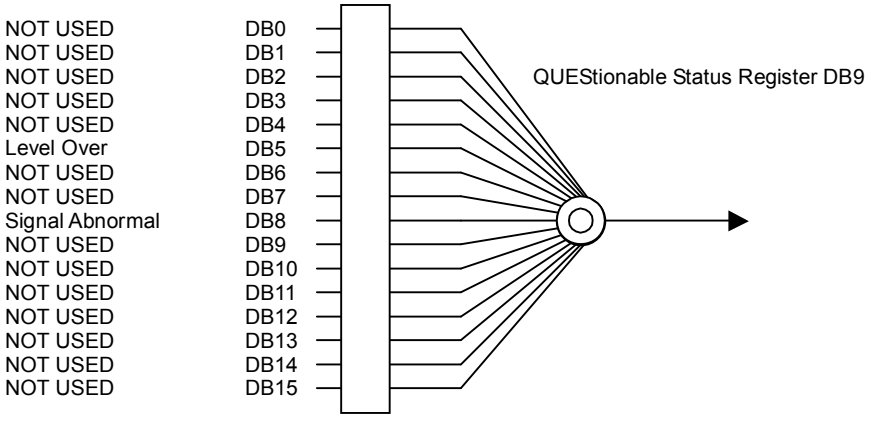


Figure 3.2-2 QUEStionable Measure Register

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

Reads 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

Reads event register of QUEStionable Status register.

```
:STAT:QUES?
> 0
```

:STATus:QUEStionable:CONDition?

Questionable Status Register Condition

Function

Reads 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

Reads Condition register of QUEStionable Status register.

```
:STAT:QUES:COND?
> 0
```

:STATus:QUEStionable:ENABle <integer>

Questionable Status Register Enable

Function

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

Sets the value of Event Enable register of QUEStionable Status register to 16.

```
:STAT:QUES:ENAB 16
```

:STATus:QUEStionable:ENABle?

Questionable Status Register Enable Query

Function

Reads 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

Reads Event Enable register of QUEStionable Status register.

```
:STAT:QUES:ENAB?
> 16
```

:STATus:QUEStionable:NTRansition <integer>

Questionable Status Register Negative Transition

Function

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

Sets transition filter (Negative Transition) of QUEStionable Status register to 16.

```
:STAT:QUES:NTR 16
```

:STATus:QUEStionable:NTRansition?

Questionable Status Register Negative Transition Query

Function

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

Queries transition filter (Negative Transition) of QUEStionable Status register.

```
:STAT:QUES:NTR?
> 16
```

:STATus:QUEStionable:PTRansition <integer>

Questionable Status Register Positive Transition

Function

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

Sets transition filter (Positive Transition) of QUEStionable Status register to 16.

```
:STAT:QUES:PTR 16
```

:STATus:QUEStionable:PTRansition?

Questionable Status Register Positive Transition Query

Function

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

Queries transition filter (Positive Transition) of QUEStionable Status register.

```
:STAT:QUES:PTR?
> 16
```

:STATus:QUEStionable:MEASure[:EVENt]?

Questionable Measure Register Event

Function

Reads 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

Reads Event register of QUEStionable Measure register.

```
:STAT:QUES:MEAS?
> 0
```

:STATus:QUEStionable:MEASure:CONDition?

Questionable Measure Register Condition

Function

Reads 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

Reads Condition register of QUEStionable Measure register.

```
:STAT:QUES:MEAS:COND?
> 0
```

:STATus:QUEStionable:MEASure:ENABle <integer>

Questionable Measure Register Enable

Function

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

Sets 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

Reads 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

Reads Event Enable register of QUEStionable Measure register.

```
:STAT:QUES:MEAS:ENAB?
> 16
```

:STATus:QUEStionable:MEASure:NTRansition <integer>

Questionable Measure Register Negative Transition

Function

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

Sets 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

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

Queries transition filter (Negative Transition) of QUEStionable Measure register.

```
:STAT:QUES:MEAS:NTR?
> 16
```

:STATus:QUEStionable:MEASure:PTRansition <integer>

Questionable Measure Register Positive Transition

Function

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

Sets 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

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

Queries 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.

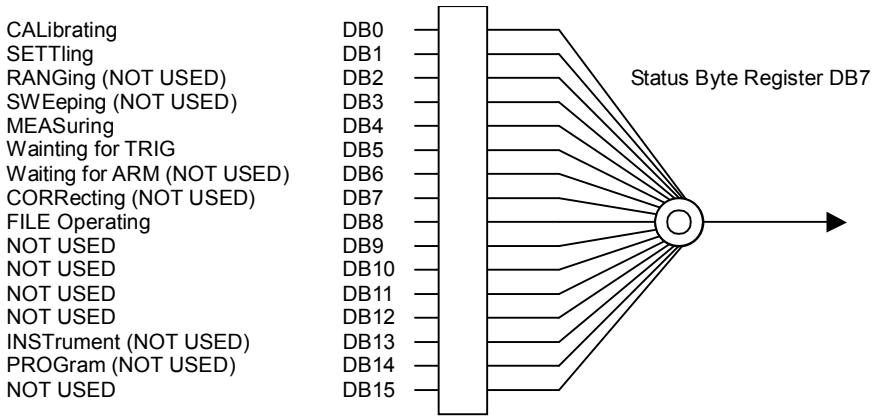


Figure 3.3-1 OPERation Status Register

Table 3.3-1 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

Reads 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

Reads Event register of OPERation Status register.

```
:STAT:OPER?
> 0
```

:STATus:OPERation:CONDition?

Operation Status Register Condition

Function

Reads Condition register of OPERation Status register.

Query

```
:STATus:OPERation:CONDition?
```

Response

```
<integer>
```

Parameter

`<integer>`		Bit Sum Total of Condition Register
	Resolution	1
	Range	0 to 65535

Usage Example

Reads Condition register of OPERation Status register.

```
:STAT:OPER:COND?
> 0
```

:STATus:OPERation:ENABle <integer>

Operation Status Register Enable

Function

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

Sets Event Enable register of OPERation Status register to 16.

```
:STAT:OPER:ENAB 16
```

:STATus:OPERation:ENABle?

Operation Status Register Enable Query

Function

Reads 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

Reads Event Enable register of OPERation Status register.

```
:STAT:OPER:ENAB?
> 16
```

:STATus:OPERation:NTRansition <integer>

Operation Status Register Negative Transition

Function

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

Sets transition filter (Negative Transition) of OPERation Status register to 16.

```
:STAT:OPER:NTR 16
```

:STATus:OPERation:NTRansition?

Operation Status Register Negative Transition Query

Function

Reads 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

Reads transition filter (Negative Transition) of OPERation Status register.

```
:STAT:OPER:NTR?
> 16
```

:STATus:OPERation:PTRansition <integer>

Operation Status Register Positive Transition

Function

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

Sets transition filter (Positive Transition) of OPERation Status register to 16.

```
:STAT:OPER:PTR 16
```

:STATus:OPERation:PTRansition?

Operation Status Register Positive Transition Query

Function

Reads 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

Reads transition filter (Positive Transition) of OPERation Status register.

```
:STAT:OPER:PTR?
> 16
```