Vector Network Analyzer

SNA5000A Series

SNA5000X-E Series

SNA6000A Series

SHN900A Series

Programming Guide

EN04A

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Contents

1 Supported Models

The SCPI commands listed in this document are applicable to the SIGLENT SNA5000A Series, SNA6000A Series, SHN900A Series, and SNA5000X-E Series vector network analyzers. The port number and frequency range information of each series model is shown in the following table:

Model	Ports	Frequency range
SNA5002A	2	9kHz-4.5GHz
SNA5004A	4	9kHz-4.5GHz
SNA5012A	2	9kHz-8.5GHz
SNA5014A	4	9kHz-8.5GHz
SNA5022A	2	100kHz-13.5GHz
SNA5032A	2	100kHz-26.5GHz
SNA6022A	2	100kHz-13.5GHz
SNA6122A	2（Including front panel jumper interface）	100kHz-13.5GHz
SNA6024A	4	100kHz-13.5GHz
SNA6124A	4（Including front panel jumper interface）	100kHz-13.5GHz
SNA6032A	2	100kHz-26.5GHz
SNA6132A	2（Including front panel jumper interface）	100kHz-26.5GHz
SNA6034A	4	100kHz-26.5GHz
SNA6134A	4（Including front panel jumper interface）	100kHz-26.5GHz
SHN914A	2	30kHz-14GHz
SHN920N	2	30kHz-20GHz
SHN926A	2	30kHz-26.5GHz
SNA5003X-E	2	9kHz-3GHz
SNA5006X-E	2	9kHz-6.5GHz

2 Programming Overview

The Vector Network Analyzer support LAN, USB Device, and GPIB-USB Host interfaces. By using these interfaces, in combination with programming languages and/or NI- VISA software, users can remotely control the analyzer based on SCPI (Standard Commands for Programmable Instruments) command set, and interoperate with other programmable instruments.

This chapter introduces how to build communication between the spectrum analyzer and a controller computer with these interfaces.

2.1 Establishing Communications

The Vector Network Analyzer provides both the USB and LAN connection which allows you to set up a remote operation environment with a controller computer. A controller computer could be a personal computer (PC) or a minicomputer. Some intelligent instruments also function as controllers.

2.1.1 Install NI-VISA

USB control requires the National Instruments NI-VISA Library for communications. We also recommend using it for LAN communications for its ease of use, but sockets, telnet, and VXI-11 can also be implemented via LAN connections.

Currently, NI-VISA is packaged in two versions: A full version and a Run-Time Engine version. The full version includes the NI device drivers and a tool named NI MAX which is a user interface to control and test remotely connected devices. The Run-Time Engine is recommended, as it is a

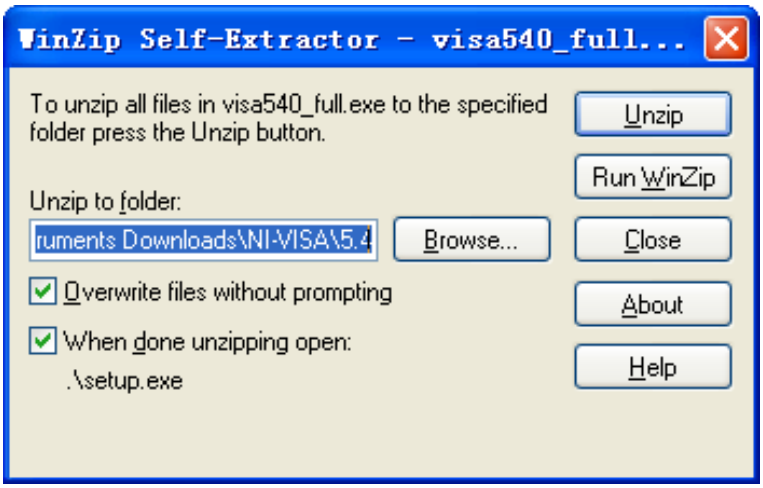
much smaller download than the full version and includes the necessary tools for basic communication to instruments.

For example, you can get the NI-VISA 5.4 full version from *http://www.ni.com/download/ni-visa-5.4/4230/en/*.

You also can download NI-VISA Run-Time Engine 5.4 to your PC and install it as the default selection. Its installation process is similar to the full version.

After you downloaded the file, follow these steps to install NI-VISA (The full version of NI-VISA 5.4 is used in this example. Newer versions are likely and should be compatible with SIGLENT instrumentation. Download the latest version available for the operating system being used by the controlling computer):

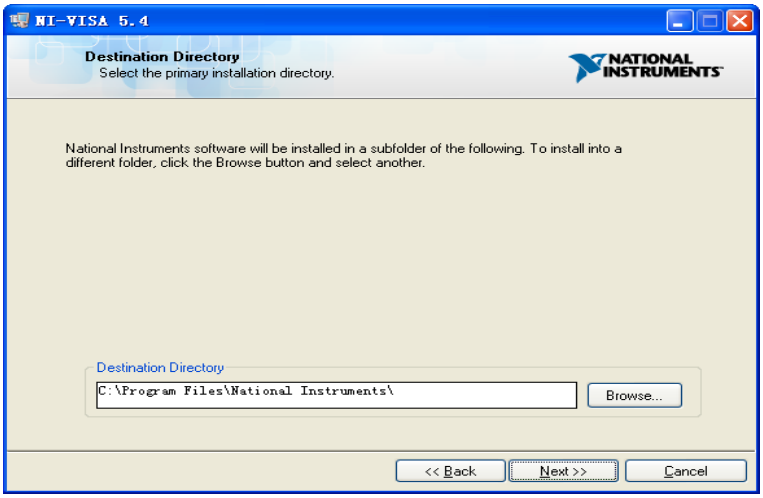
a. Double click the visa540_full.exe, the dialog will be similar to that shown below:



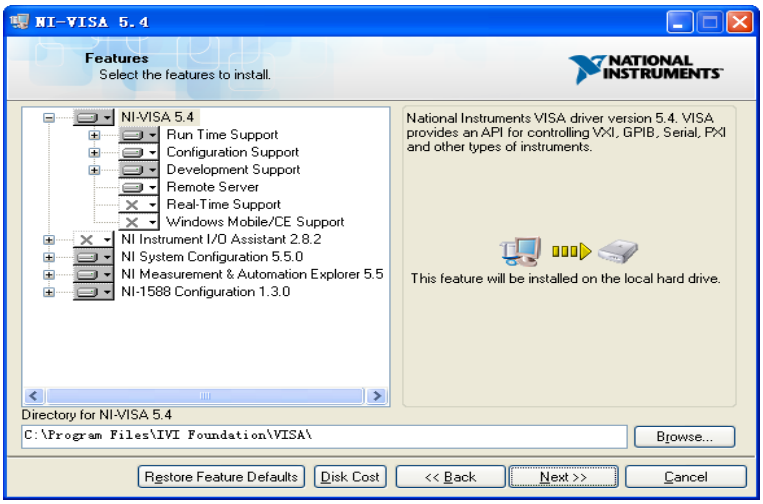
b. Click Unzip, the installation process will automatically launch after unzipping files. If your

computer needs to install .NET Framework 4, it may auto start.

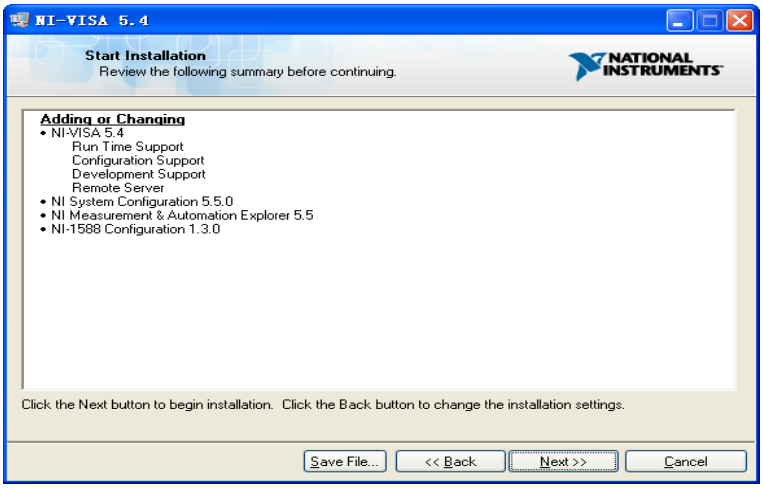
c. The NI-VISA installing dialog is shown above. Click Next to start the installation process.



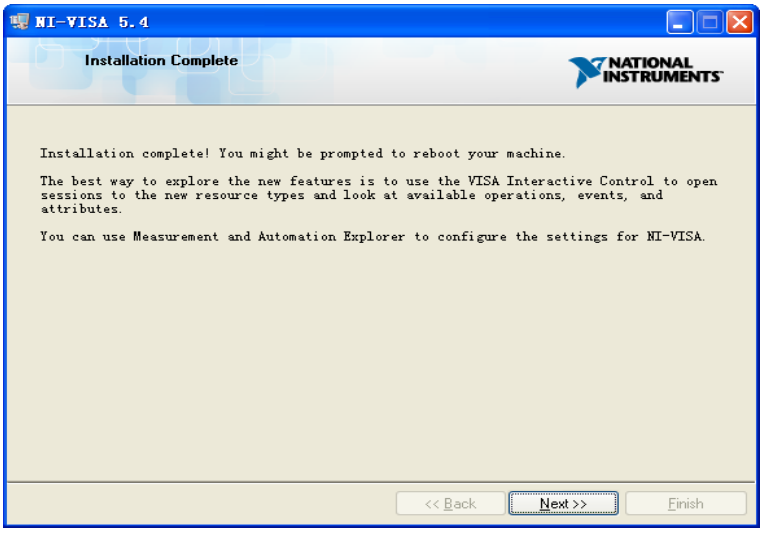
d. Set the install path. The default path is “C:\Program Files\National Instruments\”, you can change it. Click Next, dialog shown as above.



e. Click Next twice, in the License Agreement dialog, select the “I accept the above 2 License Agreement(s).”, and click Next, dialog shown as below:



f. Click Next to begin the installation.



g. Now the installation is complete. Reboot your PC.

2.1.2 Connecting the Instrument

2.1.2.1 Connecting the Analyzer via the USB Device port

Refer to the following steps to finish the connection via USB-Device:

1. Install NI-VISA on your PC for USB-TMC driver.

2. Connect the analyzer USB Device port to a PC with a USB A-B cable.

3. Switch on the analyzer.

The analyzer will be detected automatically as a new USB hardware.

2.1.2.2 Connecting the Analyzer via the LAN port

Refer to the following steps to finish the connection via LAN:

1. Install NI-VISA on your PC for VXI driver. Or without NI-VISA, using socket or telnet in your PC's Operating System.

2. Connect the analyzer to PC or the local area network with a LAN cable

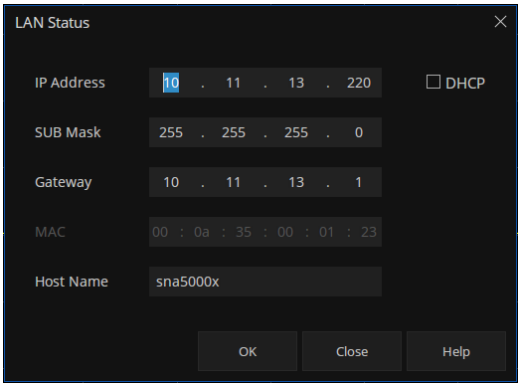
3. Switch on the analyzer.

4. Press button on the front panel System → LAN Status to enter the LAN Config

5. Select the IP Config between Static and DHCP

   - DHCP: the DHCP server in the current network will assign the network parameters automatically (IP address, subnet mask, gate way) for the analyzer.

   - Static: you can set the IP address, subnet mask, gate way manually. Press Apply.



The analyzer will be detected automatically or manually as a new LAN point.

2.1.2.3 Connecting the Analyzer via the USB-Host port (With USB-GPIB Adaptor)

Refer to the following steps to finish the connection via USB.

1. Install NI-VISA on your PC for GPIB driver.
2. Connect the analyzer USB Host port to a PC's GPIB card port, with SIGLENT USB- GPIB adaptor.

3. Switch on the analyzer
4. Press button on the front panel System →GPIB to enter the GPIB number.

The analyzer will be detected automatically as a new GPIB point.

2.2 Remote Control

2.2.1 Send SCPI Commands via NI-MAX

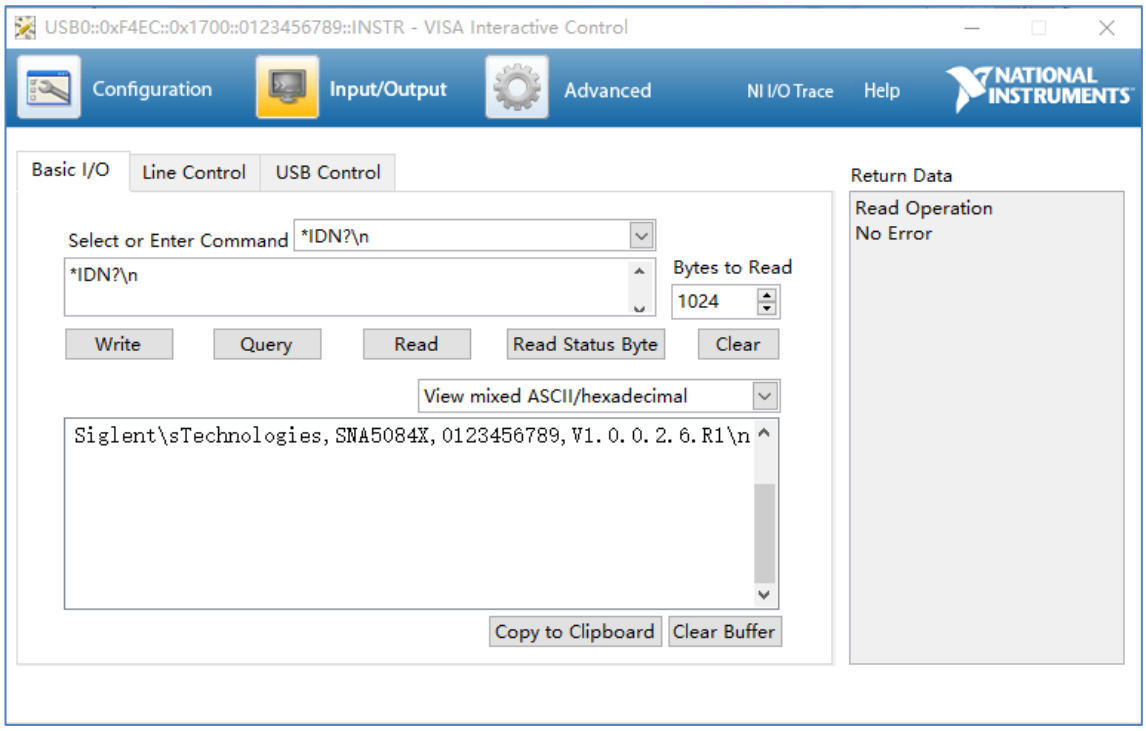
2.2.1.1 Using USB

Run NI MAX software.

1. Click "Device and interface" at the upper left corner of the software.
2. Find the "USBTMC" device symbol.

3. Click "Open VISA Test Panel" option button, then the following interface will appear.

4. Click the "Input/Output" option button and click the "Query" option button in order to view the operation information.



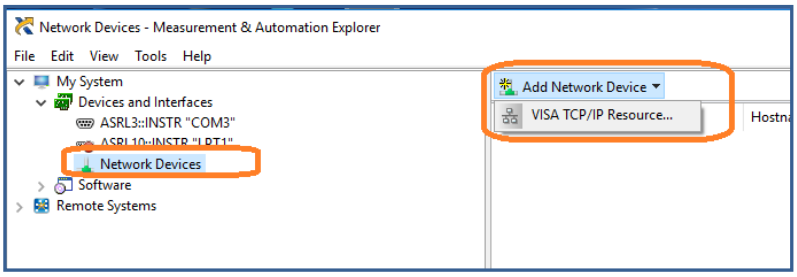
NOTE: The "*IDN?" command (known as the Identification Query) returns the instrument manufacturer, instrument model, serial number, and other identification information.

2.2.1.2 Using LAN

Select, "Add Network Device", and select "VISA TCP/IP Resource" as shown: Run NI MAX software.

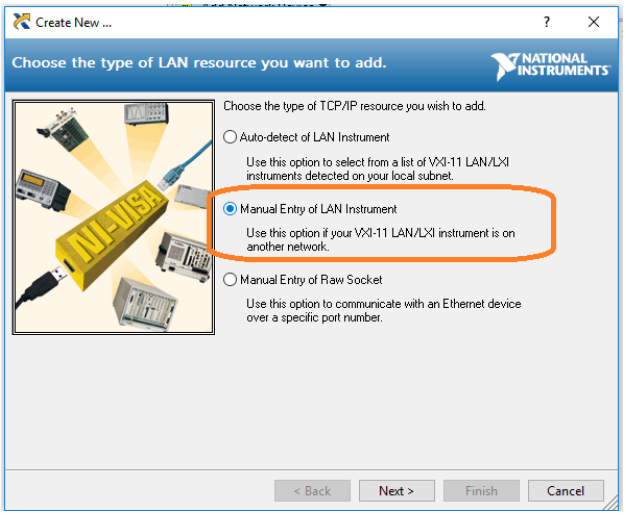
1. Click "Device and interface" at the upper left corner of the software.

2. Find the "Network Devices" symbol; click "Add Network Devices".

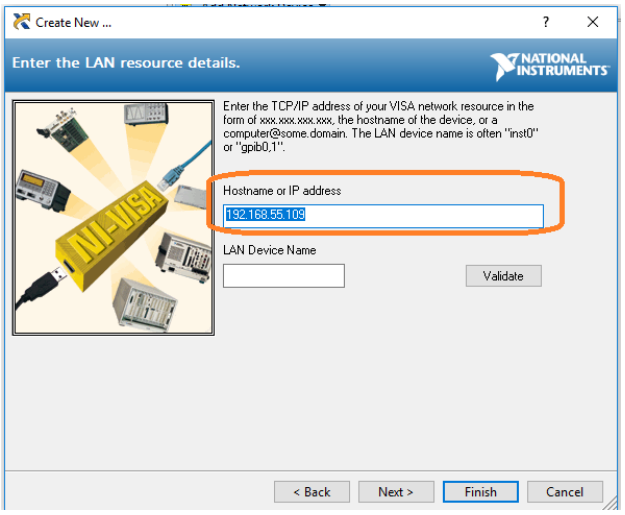


3. Select "Manual Entry of LAN instrument", select "Next", and enter the IP address as shown.

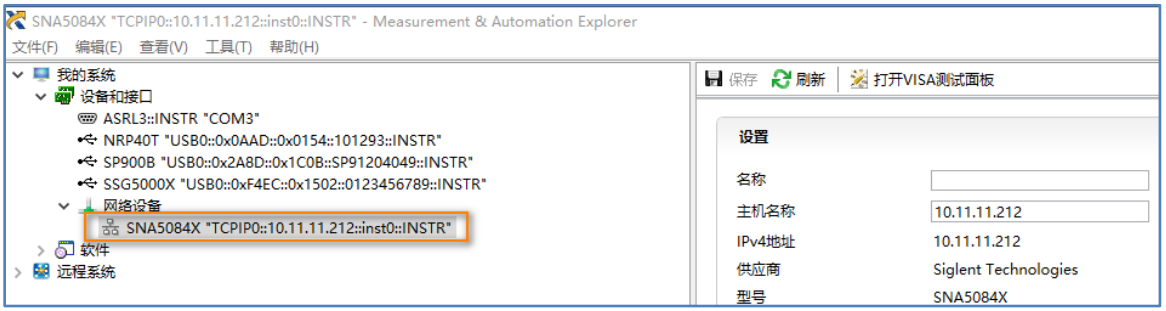
   Click Finish to establish the connection:



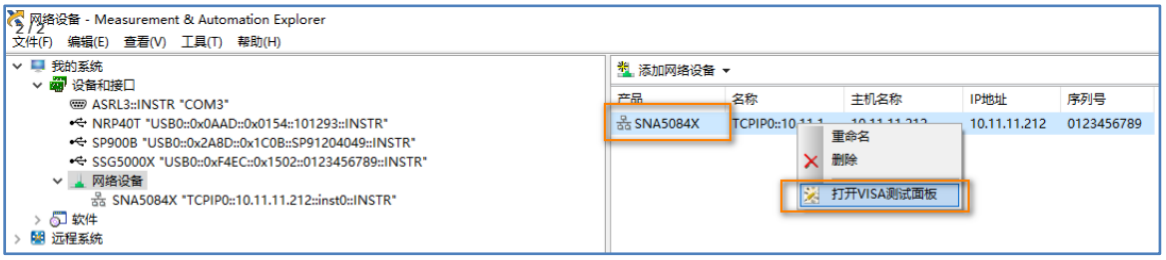
   NOTE: Leave the LAN Device Name BLANK or the connection will fail.



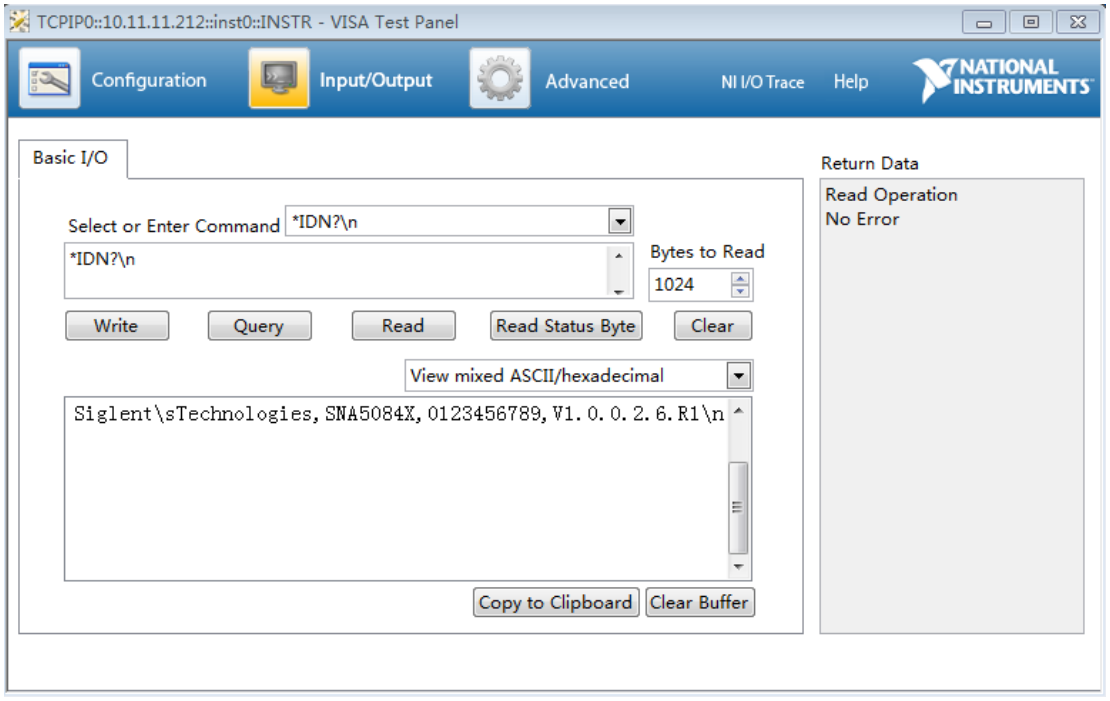
4. After a brief scan, the connection should be shown under "Network Devices":



5. Right-click on the product and select "Open NI-VISA Test Panel":



6. Click "Input/Output" option button and click "Query" option button. If everything is OK, you will see the Read operation information returned as shown below.



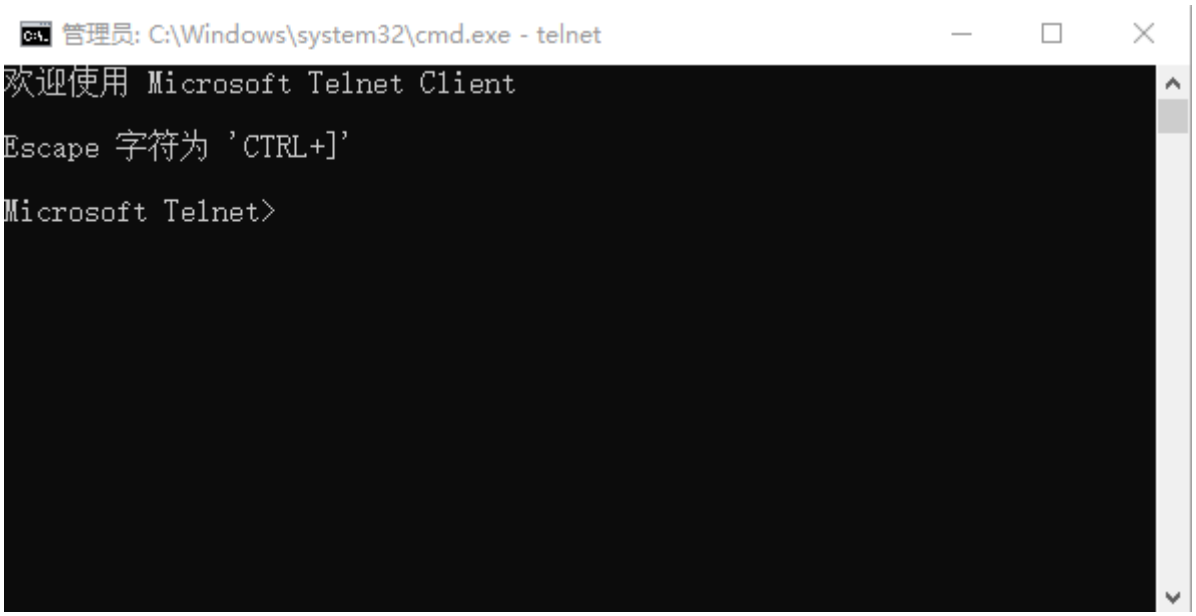
2.2.2 Using SCPI with Telnet

Telnet provides a means of communicating with the Vector Network Analyzer over a LAN connection. The Telnet protocol sends SCPI commands to the Analyzer from a PC and is similar to communicating with the Vector Network Analyzer over USB. It sends and receives information interactively: one command at a time. Windows operating systems use a command prompt style interface for the Telnet client. The steps are as follows:

1. On your PC, click Start > All Programs > Accessories > Command Prompt.

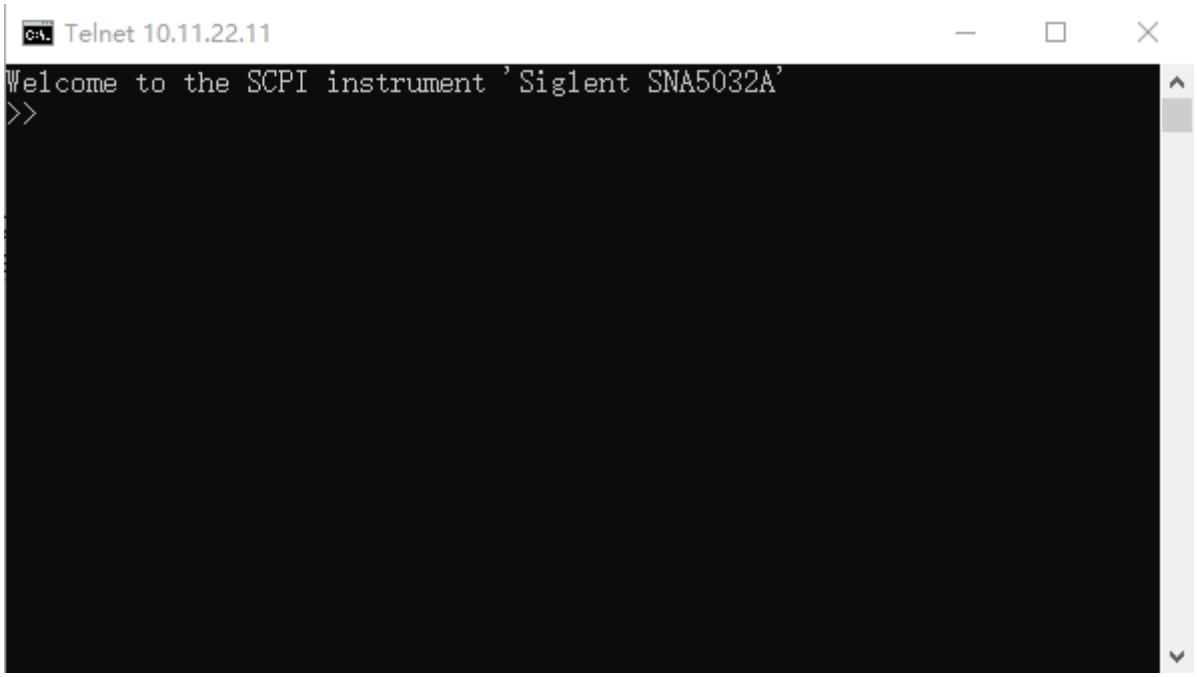
2. At the command prompt, type in telnet.

3. Press the Enter key. The Telnet display screen will be displayed.

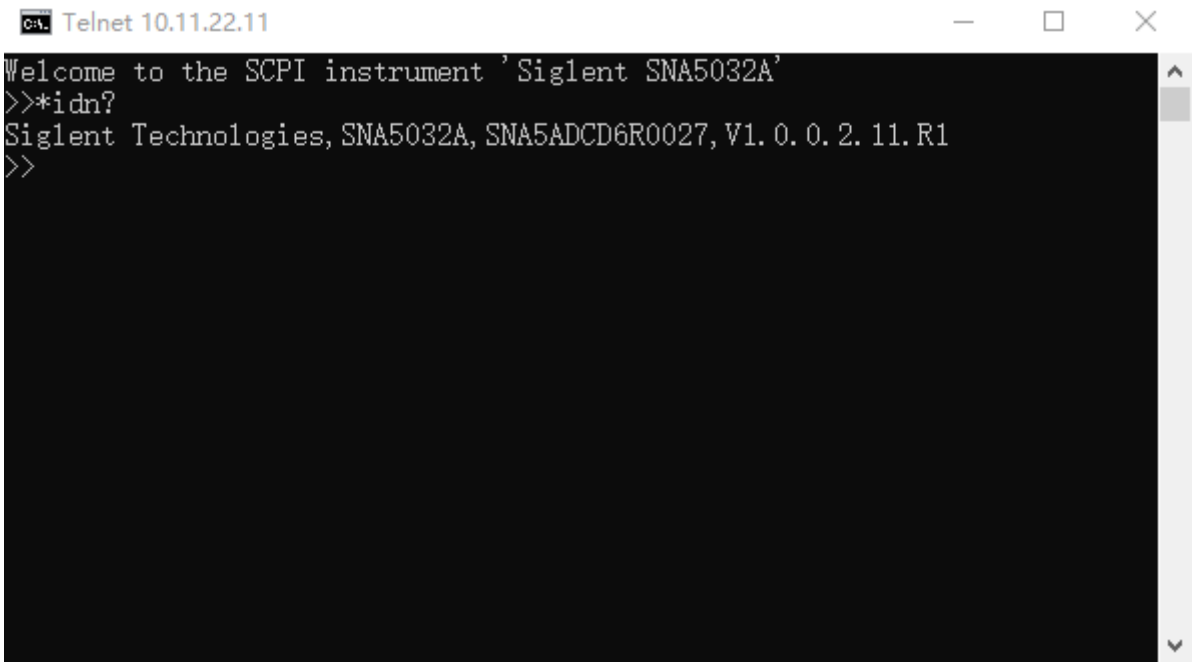


4. At the Telnet command line, type: *open XXX.XXX.XXX.XXX 5024*

Where XXX.XXX.XXX.XXX is the instrument's IP address and 5024 is the port. You should see a response similar to the following:



5. At the SCPI> prompt, input the SCPI commands such as **IDN?* to return the company name, model number, serial number, and firmware version number.



6. To exit the SCPI> session, press the Ctrl+] keys simultaneously.

7. Type *quit* at the prompt or close the Telnet window to close the connection to the instrument and exit Telnet.

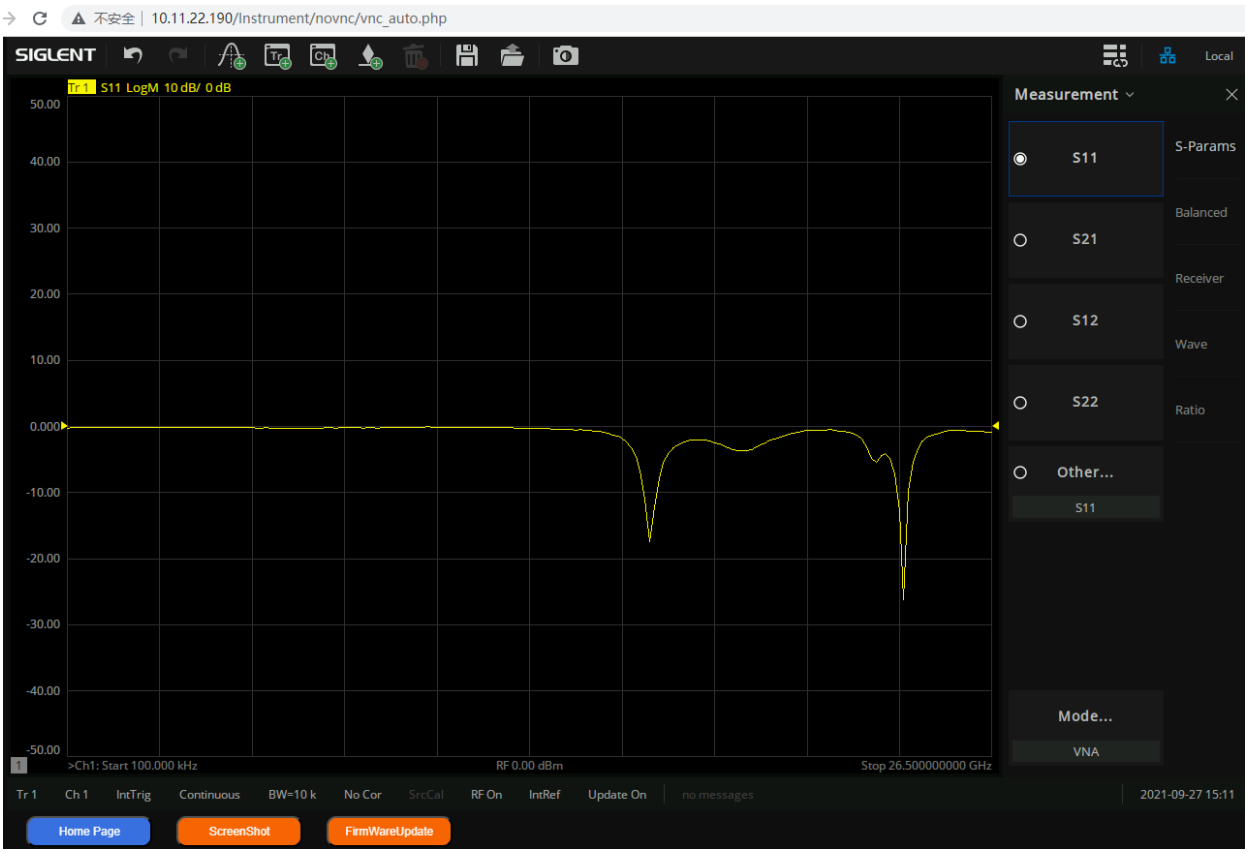
2.2.3 Using SCPI with Sockets

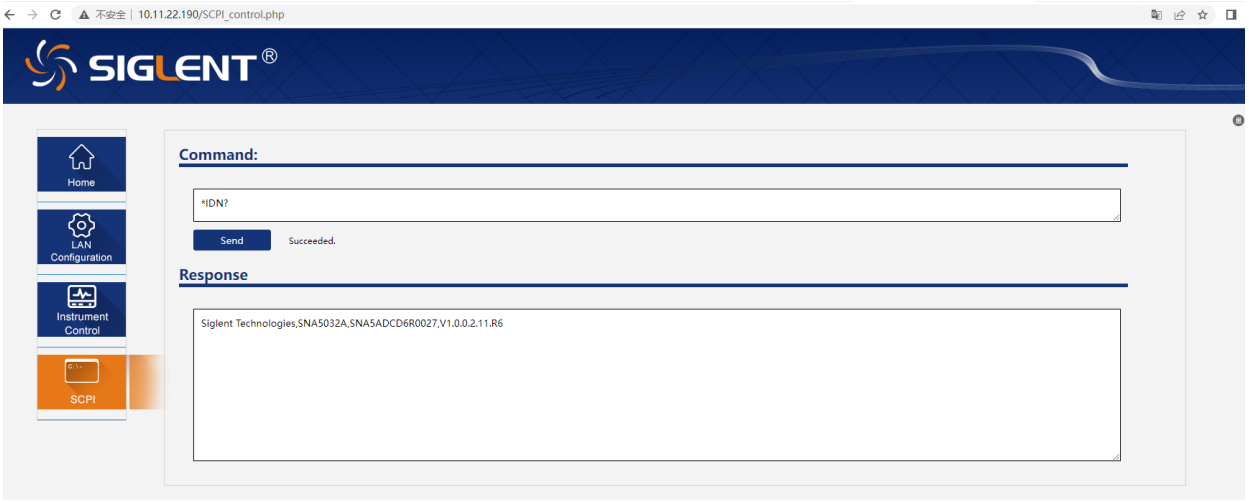
Socket API can be used to control the Vector Network Analyzer via LAN without installing any other libraries. This can reduce the complexity of programming.

SOCKET ADDRESS	IP address+port number
IP ADDRESS	SDS IP address
PORT NUMBER	5025

2.2.4 Using SCPI with Webserver

The analyzer can be controlled remotely from a Web browser on a PC or mobile terminal, and no drivers need to be installed. It mimics the touch-screen/mouse-clickable display function, just like a physical instrument. The browser also supports Screen Shot and FirmWare Update functions.





* web browsers that support HTML5, such as Chrome or Firefox, are recommended.

2.3 Introduction to the SCPI Language

2.3.1 Command Format

SCPI commands present a hierarchical tree structure containing multiple subsystems, and each of the subsystems is made up of a root keyword and several subkeywords. The command string usually starts with ":", the keywords are separated by ":" and the followed parameter settings are separated by space. Query commands add "?" at the end of the string.

For example:

:SENSe:FREQuency:CENTer <freq>

:SENSe:FREQuency:CENTer?

SENSe is the root key of the command, FREQuency and CENTer are second and third keywords. The command begins with ":", and separates the keywords at the same time, and the <freq> separated by space and represents the parameter available for setting; "?" represents a query.

2.3.2 Symbol Instruction

The following four symbols are not the content of SCPI commands and cannot be sent with the commands, but are usually used in the commands.

1. Braces {}

The parameters in the braces are optional which can be ignored or set for one or more times. For example:

":SENSe<cnum>:SEGMent:LIST:CONTrol:DATA <Boolean>{,<Boolean>}" in the command, the

{,<Boolean>} parameters can be ignored or set for one or more times.

2. Vertical Bar |

The vertical bar is used to separate multiple parameters and when sending the command, you can choose one of the parameters. For example, In the ":DISPlay:MAXimize ON|OFF|1|0" command, the parameters available are "OFF", "ON", "0" or "1".

3. Square Brackets [ ]

The content in the square brackets can be ignored. When the parameter is ignored, the instrument will set the parameter to its default. For example,

In the ":SENSe:CORRection:IMPedance[:INPut][:MAGNitude]?" command, sending any of the four commands below can generate the same effect:

:SENSe:CORRection:IMPedance?

:SENSe:CORRection:IMPedance:INPut?

:SENSe:CORRection:IMPedance:MAGNitude?

:SENSe:CORRection:IMPedance:INPut:MAGNitude?

4. Triangle Brackets < >

The parameter in the triangle brackets must be replaced by an effective value. For example,

Send the ":SENSe1:SWEep:POINts <value>" command in ":SENSe1:SWEep:POINts 201".

2.3.3 Parameter Type

The parameters in the commands introduced in this manual include 5 types: Boolean, enumeration, integer, float and string.

1. Boolean

The parameters in the commands could be "OFF", "ON", "0" or "1". For example,

:SENSe1:AVERage:STATe <bool>

:SENSe1:AVERage:STATe?

<bool> can be set to ON|OFF|0|1

The query returns 1 or 0

2. Enumeration

The parameter could be any of the values listed. For example:

:SENSe1:SWEep:TYPE <type>

:SENSe1:SWEep:TYPE?

<type> can be set to LINear | LOGarithmic | POWer | CW|SEGMent

The query returns an abbreviated form as: LIN|LOG|POW|CW|SEGM

3. Integer

Except other notes, the parameter can be any integer within the effective value range. For example:

:SYSTem:COMMunicate:GPIB:ADDRess <value>

:SYSTem:COMMunicate:GPIB:ADDRess?

<value> can be an integer between 0 and 30.

The query returns an integer between 0 and 30.

4. Float

The parameter could be any value within the effective value range according to the accuracy requirement (the default accuracy contains up to 9 digits after the decimal points). For example:

:CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:THReshold <value>

:CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:THReshold?

<value> can set to a real number between -5E2 (i.e. -500dB) and 5E2 (i.e. 500dB).

The query returns the set float number.

5. String

The parameter should be the combinations of ASCII characters. For example:

:SYSTem:COMMunicate:LAN:IPADdress <"xxx.xxx.xxx.xxx">

The parameter can be set as "192.168.1.12" string.

2.3.4 Return Value

The analyzer sends different response data types depending on the parameter being queried. There are four types of data: numeric data, character data, string data, and block data.

1. Numeric Data

All numeric data sent over the GPIB is ASCII character data. Your programming environment may convert the character data to numeric data for you. Boolean data (1 | 0) is a type of numeric data.

2. Character Data

Character data consists of ASCII characters grouped together in mnemonics that represent specific analyzer settings.

3. String Data

String data consists of ASCII characters. String parameters can contain virtually any set of ASCII characters. When sending string data to the analyzer, the string must begin with a single quote (') or a double quote (") and end with the same character (called the delimiter).

The analyzer always encloses data in double quotes when it returns string data.

4. Block Data

Block data is used to transfer measurement data. Although the analyzer will accept either definite length blocks or indefinite length blocks, it always returns definite length block data in response to queries unless the specified format is ASCII.

Example of Definite Block Data: #212ABCDEF123456

Where:

- # - always sent before definite block data
- 2 - specifies that the byte count is two digits (2)
- 12 - specifies the number of data bytes that will follow
- ABCDEF123456 - 12 digits of data

2.3.5 Command Abbreviation

All of the commands are not case sensitive, so you can use any of them. But if abbreviation is used, all the capital letters in the command must be written completely. For example:

:CALCulate1:TRACe1:BLIMit:MINimum?

Can be abbreviated to:

:CALC1:TRAC1:BLIM:MIN?

2.4 Format Conventions in this Manual

1. Key

   The key on the front panel is denoted by the format of “Key Name (Bold) + Text Box” in the

manual. For example, Avg BW denotes the “Avg BW” key.

2. Menu

   The menu items are denoted by the format of “Menu word + Character Shading”. For example, Smooth Percent denotes the “Smooth Percent” menu item under “Smoothing”.

3. Operation Procedures

   > denotes the next step of operation. For example, Smoothing > Smooth Percent denotes that first press Smoothing, and then press the Smooth Percent key.

3 System Commands

This chapter describes the format, functions, parameters, and usage of the commands in the Network Vector Analysis command set.

The main content of this chapter:

1. IEEE Common Commands
2. AVG BW Commands
3. Cal Commands
4. Display Commands
5. Format Commands
6. Frequency Commands
7. Math Commands
8. Marker Commands
9. Meas Commands
10. Power Commands
11. SaveRecall Commands
12. Scale Commands
13. Search Commands
14. Service Commands
15. Sweep Commands
16. System Commands
17. Trigger Commands
18. Pulse Measurement Commands (Option, SHN900A series models do not support)

19. Spectrum Analyzer Commands(Option)

20. MIXER Commands(Option, SHN900A series models do not support)

21. TDR Commands(Option)

3.1 IEEE Common Commands

3.1.1 Command List

Identification Query (*IDN)	*IDN?
Reset (*RST)	*RST
Clear Status (*CLS)	*CLS
Standard Event Status Enable (*ESE)	*ESE
Standard Event Status Register Query (*ESR)	*ESR
Operation Complete Query (*OPC)	*OPC
Service Request Enable (*SRE)	*SRE
Status Byte Query (*STB)	*STB
Wait-to-Continue (*WAI)	*WAI
Trigger a sweep (*TRG)	*TRG

3.1.2 Identification Query (*IDN)

Command Format	*IDN?
Instruction	Returns an instrument identification information string. The string will contain the manufacturer, model number, serial number, and software

	number.
Menu	None
Example	*IDN? Return: Siglent Technologies,SNA5084X,1234567890,V1.0.0.1.5

3.1.3 Reset (*RST)

Command Format	*RST
Instruction	This command presets the instrument to a factory defined condition that is appropriate for remote programming operation. *RST is equivalent to performing the two commands :SYSTem:PRESet and *CLS. This command always performs a factory preset.
Menu	None
Example	*RST

3.1.4 Clear Status (*CLS)

Command Format	*CLS
Instruction	Clears the status byte register. It does this by emptying the error queue and clearing all bits in all of the event registers. The status byte register summarizes the states of the other registers. It is also responsible for generating service requests.
Menu	None
Example	*CLS

3.1.5 Standard Event Status Enable (*ESE)

Command Format	*ESE <numeric> *ESE?

Instruction	Set the bits in the Standard Event Status Enable Register. This register monitors I/O errors and synchronization conditions such as operation complete, request control, query error, device dependent error, execution error, command error and power on. A summary bit is generated on execution of thecommand. The query returns the state of the Standard Event Status Enable Register.
Menu	None
Example	*ESE 16 *ESE? Return: 16

3.1.6 Standard Event Status Register Query (*ESR)

Command Format	*ESR?
Instruction	This command reads the value of the Standard Event Status Register. Execution of this command clears the register value.
Menu	None
Example	*ESR?

3.1.7 Operation Complete Query (*OPC)

Command Format	*OPC *OPC?
Instruction	Set bit 0 in the Standard Event Status Register to "1" when all pending operations have finished. The query stops any new commands from being processed until the current processing is complete. Then it returns a "1", and the program continues. This query can be used to synchronize events of other instruments on the external bus. Returns a "1" if the last processing is complete. Use this query when there's a need to monitor the command execution status, such as a

	sweep execution.
Menu	None
Example	TRIG:SOUR BUS INIT:CONT ON TRIG:SING *OPC?

3.1.8 Service Request Enable (*SRE)

Command Format	*SRE <integer> *SRE?
Instruction	This command enables the desired bits of the Service Request Enable Register. The query returns the value of the register, indicating which bits are currently enabled. The default value is 0.
Menu	None
Example	*SRE 1 *SRE?

3.1.9 Status Byte Query (*STB)

Command Format	*STB?
Instruction	This command reads the value of Status Byte Register.
Menu	None
Example	*STB?

3.1.10 Wait-to-Continue (*WAI)

Command Format	*WAI
Instruction	This command causes the instrument to wait until all pending commands are completed before executing any additional commands.

	There is no query form to the command.
Menu	None
Example	*WAI

3.1.11 Trigger a sweep (*TRG)

Command Format	*TRG
Instruction	This command triggers the SNA if the trigger source is set to BUS.
Menu	None
Example	*TRG

3.2 AVG BW Commands

3.2.1 Command List

State of Average	:SENSe<cnum>:AVERage[:STATe]
Average Count	:SENSe<cnum>:AVERage:COUNt
current average number	:SENSe<cnum>:AVERage:CURRent?
Completion status of the average	:SENSe<cnum>:AVERage:COMPlete?
Average Restart	:SENSe<cnum>:AVERage:CLEar
IF Bandwidth	:SENSe<cnum>:BANDwidth[:RESolution]
Smooth State	:CALCulate<cnum>:TRACe<tnum>:SMOothing[:STATe]
Smooth Aperture	:CALCulate<cnum>:TRACe<tnum>:SMOothing:APERture
Smooth Points	:CALCulate<cnum>:MEASure<tnum>:SMOothing:POINts

3.2.2 State of Average

Command Format	:SENSe<cnum>:AVERage[:STATe] <bool> :SENSe<cnum>:AVERage[:STATe]?
Instruction	This command sets/gets the averaging function of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	OFF
Menu	Avg BW > Averaging > Averaging Enable
Example	:SENSe1:AVERage 1 :SENSe1:AVERage? Return: 1

3.2.3 Average Count

Command Format	:SENSe<cnum>:AVERage:COUNt <numeric> :SENSe<cnum>:AVERage:COUNt?
Instruction	This command sets/gets the averaging factor of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the average count, and the parameter range: 2~999.
Return	Integer
Default	16
Menu	Avg BW > Averaging > Averaging
Example	:SENSe1:AVERage:COUNt 10 :SENSe1:AVERage:COUNt? Return: 10

3.2.4 current average number

Command Format	:SENSe<cnum>:AVERage:CURRent?
Instruction	This command gets the current average number of times of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.

Return	Integer
Default	None
Menu	None
Example	:SENSe1:AVERage:CURRent? Return: 10

3.2.5 Completion status of the average

Command Format	:SENSe<cnum>:AVERage:COMPlete?
Instruction	This command gets the completion status of the average count of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Boolean
Default	None
Menu	None
Example	:SENSe1:AVERage:COMPlete? Return: 1

3.2.6 Average Restart

Command Format	:SENSe<cnum>:AVERage:CLEar
Instruction	This command resets the data count to 0, used for averaging of selected channel. Measurement data before the execution of this object is not used for averaging.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None

Menu	Avg BW > Averaging > Averaging Restart
Example	:SENSe1:AVERage:CLEar

3.2.7 IF Bandwidth

Command Format	:SENSe<cnum>:BANDwidth[:RESolution] <numeric> :SENSe<cnum>:BANDwidth[:RESolution]? :SENSe<cnum>:BWIDth[:RESolution] <numeric> :SENSe<cnum>:BWIDth[:RESolution]?
Instruction	This command sets/gets the IF bandwidth of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:={1|2|3|4|5|6|7|10|15|20|30|40|50|70|100|150|200|300|400|500|700|1E3|1.5E3|2E3|3E3|4E3|5E3|7E3|10E3|15E3|20E3|30E3|40E3|50E3|70E3|100E3|150E3|200E3|300E3|400E3|500E3|700E3|1E6|1.5E6|2E6|3E6|4E6|5E6|7E6|10E6}, unit: Hz.
Return	Enumeration, unit: Hz
Default	10 kHz
Menu	Avg BW > Averaging > IF Bandwidth
Example	:SENSe1:BANDwidth 7e3 :SENSe1:BANDwidth? Return: 7000

3.2.8 Smooth State

Command Format	:CALCulate<cnum>[:SELected]:SMOothing[:STATe] <bool> :CALCulate<cnum>[:SELected]:SMOothing[:STATe]? :CALCulate<cnum>:TRACe<tnum>:SMOothing[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:SMOothing[:STATe]?
Instruction	This command turns ON/OFF the smoothing for the active trace of selected channel (Ch).

	This command turns ON/OFF the smoothing for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Avg BW > Smoothing > Smoothing
Example	:CALCulate1:SMOothing ON :CALCulate1:SMOothing? Return: 1 :CALCulate1:TRACe1:SMOothing OFF :CALCulate1:TRACe1:SMOothing? Return: 0

3.2.9 Smooth Aperture

Command Format	:CALCulate<cnum>[:SELected]:SMOothing:APERture <numeric> :CALCulate<cnum>[:SELected]:SMOothing:APERture? :CALCulate<cnum>:TRACe<tnum>:SMOothing:APERture <numeric> :CALCulate<cnum>:TRACe<tnum>:SMOothing:APERture?
Instruction	This command sets/gets the smoothing aperture for the active trace of selected channel (Ch). This command sets/gets the smoothing aperture for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<numeric>:represents the smoothing aperture, and the parameter range: 1~25.
Return	Float, unit %
Default	2.49
Menu	Avg BW > Smoothing > Smoothing Percent
Example	:CALCulate1:SMOothing:APERture 14.43 :CALCulate1:SMOothing:APERture? Return: 14.4278606965174 :CALCulate1:TRACe1:SMOothing:APERture 20 :CALCulate1:TRACe1:SMOothing:APERture? Return: 19.4029850746269

3.2.10 Smooth Points

Command Format	:CALCulate<cnum>:MEASure<tnum>:SMOothing:POINts <numeric> :CALCulate<cnum>:MEASure<tnum>:SMOothing:POINts?
Instruction	This command sets/gets the smoothing points for the active trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the smoothing points, and the parameter range: 1~4999.
Return	Interger
Default	5
Menu	Avg BW > Smoothing > Smoothing Points
Example	:CALCulate1:MEASure1:SMOothing:POINts 15 :CALCulate1:MEASure1:SMOothing:POINts? Return: 15

3.3 Cal Commands

3.3.1 Cal

3.3.1.1 Basic Cal

3.3.1.1.1 Command List

Cancel the Calibration Measurement	:SENSe<cnum>:CORRection:COLLect:CLEar
Save Calibration Data	:SENSe<cnum>:CORRection:COLLect:SAVE
Set Calibration Type to Response(Open)	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:OPEN
Set Calibration Type to Response(Short)	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:SHORt
Set Calibration Type to Response(Thru)	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:THRU
Calibration Type to Enhanced Response	:SENSe<cnum>:CORRection:COLLect:METHod:ERESponse
Set Calibration Type to OSL	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT1
Set Calibration Type to 2-Port SOLT	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT2
Set Calibration Type to 3-Port SOLT	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT3
Set Calibration Type to 4-Port SOLT	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT4
Set Calibration Type to 2-port TRL	:SENSe<cnum>:CORRection:COLLect:METHod:TRL2
Set Calibration Type to 3-port TRL	:SENSe<cnum>:CORRection:COLLect:METHod:TRL3
Set Calibration Type to 4-port TRL	:SENSe<cnum>:CORRection:COLLect:METHod:TRL4
Measure Open Calibration Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:OPEN
Measure Short Calibration Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:SHORt
Measure Load Calibration Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:LOAD
Measure Thru Calibration Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:THRU
Measure Isolation Calibration Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:ISOLation
Measure TRL Calibration Thru Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLThru
Measure TRL Calibration Reflect Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLReflect
Measure TRL Calibration Line Data	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLLine
Clear Error Coefficient	:SENSe<cnum>:CORRection:CLEar
Error Coefficient Data	:SENSe<cnum>:CORRection:COEFficient[:DATA]

Import Response(Open) Data	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:OPEN
Import Response(Short) Data	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:SHORt
Import Response(Thru) Data	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:THRU
Import Enhanced Response Data	:SENSe<cnum>:CORRection:COEFficient:METHod:ERESponse
Import 1 Port SOLT Data	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT1
Import 2 Port SOLT Data	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT2
Import 3 Port SOLT Data	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT3
Import 4 Port SOLT Data	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT4
Save Error Coefficient Data	:SENSe<cnum>:CORRection:COEFficient:SAVE
Save Partially Rewritten Calibration Data	:SENSe<cnum>:CORRection:COLLect:PARTial:SAVE

3.3.1.1.2 Cancel the Calibration Measurement

Command Format	:SENSe<cnum>:CORRection:COLLect:CLEar
Instruction	This command clears the calibration measurement data when the frequency offset feature is off, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Cal > Basic Cal > Cancel Cal > Basic Cal > Next > Cancel
Example	:SENSe1:CORRection:COLLect:CLEar

3.3.1.1.3 Save Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect:SAVE
Instruction	This command calculates the calibration coefficients depending on the calibration type selection, from the measured calibration data and save it.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Cal > Basic Cal > Finish
Example	:SENSe1:CORRection:COLLect:SAVE

3.3.1.1.4 Set Calibration Type to Response(Open)

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:OPEN <pnum>
Instruction	This command sets the calibration type to the response calibration (open) of the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Open)
Example	:SENSe1:CORRection:COLLect:METHod:OPEN 2

3.3.1.1.5 Set Calibration Type to Response(Short)

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:SHORt <pnum>
Instruction	This command sets the calibration type to the response calibration (short) of the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.

Return	None
Default	None
Menu	Cal > Basic Cal > Response(Short)
Example	:SENSe1:CORRection:COLLect:METHod:SHORt 3

3.3.1.1.6 Set Calibration Type to Response(Thru)

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod[:RESPonse]:THRU <pnum1>,<pnum2>
Instruction	This command sets the calibration type to the response calibration (thru) between the specified 2 ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Thru)
Example	:SENSe1:CORRection:COLLect:METHod:THRU 1,2

3.3.1.1.7 Calibration Type to Enhanced Response

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:ERESponse <pnum1>,<pnum2>
Instruction	This command sets the calibration type to the enhanced response calibration between the two specified ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.

Return	None
Default	None
Menu	Cal > Basic Cal > Enhanced Response
Example	:SENSe1:CORRection:COLLect:METHod:ERESponse 1,2

3.3.1.1.8 Set Calibration Type to OSL

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT1 <pnum>
Instruction	This command sets the calibration type to the 1-port calibration OSL of the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > OSL
Example	:SENSe1:CORRection:COLLect:METHod:SOLT1 3

3.3.1.1.9 Set Calibration Type to 2-Port SOLT

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT2 <pnum1>,<pnum2>
Instruction	This command sets the calibration type to the 2-port calibration SOLT of the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1> :={1|2|3|4}, specifies port number for 2-port calibration. <pnum2> :={1|2|3|4}, specifies port number for 2-port calibration. If you specify the same port number to 2 port numbers, an error occurs when executed. The order of the 2 port numbers to be specified is arbitrary.

Return	None
Default	None
Menu	Cal > Basic Cal > SOLT
Example	:SENSe1:CORRection:COLLect:METHod:SOLT2 1,2

3.3.1.1.10 Set Calibration Type to 3-Port SOLT

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT3 <pnum1>,<pnum2>,<pnum3>
Instruction	This command sets the calibration type to the 3-port calibration SOLT between the specified 3 ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies port number for 3-port calibration. <pnum2>:={1|2|3|4}, specifies port number for 3-port calibration. <pnum3>:={1|2|3|4}, specifies port number for 3-port calibration. If you specify the same port number to 3 port numbers, an error occurs when executed. The order of the 3 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > Basic Cal > SOLT
Example	:SENSe1:CORRection:COLLect:METHod:SOLT3 1,2,4

3.3.1.1.11 Set Calibration Type to 4-Port SOLT

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:SOLT4 <pnum1>,<pnum2>,<pnum3>,<pnum4>
Instruction	This command sets the calibration type to the full 4-port calibration SOLT, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies port number for 4-port calibration. <pnum2>:={1|2|3|4}, specifies port number for 4-port calibration. <pnum3>:={1|2|3|4}, specifies port number for 4-port calibration. <pnum4>:={1|2|3|4}, specifies port number for 4-port calibration. If you specify the same port number to 4 port numbers, an error occurs when executed. The order of the 4 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > Basic Cal > SOLT
Example	:SENSe1:CORRection:COLLect:METHod:SOLT4 1,2,3,4

3.3.1.1.12 Set Calibration Type to 2-port TRL

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:TRL2 <pnum1>,<pnum2>
Instruction	This command sets the calibration type to 2-port TRL between the 2 specified ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1> :={1|2|3|4}, specifies port number for TRL 2-port calibration. <pnum2> :={1|2|3|4}, specifies port number for TRL 2-port calibration. If you specify the same port number to 2 port numbers, an error occurs when executed. the order of the 2 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL
Example	:SENSe1:CORRection:COLLect:METHod:TRL2 1,2

3.3.1.1.13 Set Calibration Type to 3-port TRL

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:TRL3 <pnum1>,<pnum2>,<pnum3>
Instruction	This command sets the calibration type to 3-port TRL between the 3 specified ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1> :={1|2|3|4}, specifies port number for TRL 3-port calibration. <pnum2> :={1|2|3|4}, specifies port number for TRL 3-port calibration. <pnum3> :={1|2|3|4}, specifies port number for TRL 3-port calibration. If you specify the same port number to 3 port numbers, an error occurs when executed. the order of the 3 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL
Example	:SENSe1:CORRection:COLLect:METHod:TRL3 1,2,3

3.3.1.1.14 Set Calibration Type to 4-port TRL

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:TRL4 <pnum1>,<pnum2>,<pnum3>,<pnum4>
Instruction	This command sets the calibration type to the 4-port calibration TRL between the 4 specified ports, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1> :={1|2|3|4}, specifies port number for TRL 4-port calibration. <pnum2> :={1|2|3|4}, specifies port number for TRL 4-port calibration. <pnum3> :={1|2|3|4}, specifies port number for TRL 4-port calibration. <pnum4> :={1|2|3|4}, specifies port number for TRL 4-port calibration. If you specify the same port number to 4 port numbers, an error occurs when executed. the order of the 4 port numbers to be specified is

	arbitrary.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL
Example	:SENSe1:CORRection:COLLect:METHod:TRL4 1,2,3,4

3.3.1.1.15 Measure Open Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:OPEN <pnum>
Instruction	This command measures the calibration data of the OPEN standard for the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Open) > Open Cal > Basic Cal > OSL > Open Cal > Basic Cal > Enhanced Response > Open Cal > Basic Cal > SOLT > Open Cal > Basic Cal > SOLR > Open
Example	:SENSe1:CORRection:COLLect:OPEN 1

3.3.1.1.16 Measure Short Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:SHORt <pnum>
Instruction	This command measures the calibration data of the Short standard for the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Short) > Short Cal > Basic Cal > OSL > Short Cal > Basic Cal > Enhanced Response > Short Cal > Basic Cal > SOLT > Short Cal > Basic Cal > SOLR > Short
Example	:SENSe1:CORRection:COLLect:SHORt 1

3.3.1.1.17 Measure Load Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:LOAD <pnum>
Instruction	This command measures the calibration data of the load standard for the specified port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Open) > Load(Optional) Cal > Basic Cal > Response(Short) > Load(Optional) Cal > Basic Cal > OSL > Load Cal > Basic Cal > Enhanced Response > Load Cal > Basic Cal > SOLT > Load Cal > Basic Cal > SOLR > Load
Example	:SENSe1:CORRection:COLLect:LOAD 1

3.3.1.1.18 Measure Thru Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:THRU <pnum1>,<pnum2>
Instruction	This command measures the calibration data of the Thru sdandard from the specified stimulus port to the specified response port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number. If you specify the same port number to 2 port numbers, an error occurs when executed.
Return	None
Default	None
Menu	Cal > Basic Cal > Response(Thru) > Thru Cal > Basic Cal > Enhanced Response > Thru Cal > Basic Cal > SOLT > Thru Cal > Basic Cal > SOLR > Unknown Thru
Example	:SENSe1:CORRection:COLLect:THRU 1,4

3.3.1.1.19 Measure Isolation Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:ISOLation <pnum1>,<pnum2>
Instruction	This command measures the calibration data of the isolation from the specified stimulus port to the specified response port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number. If you specify the same port number to 2 port numbers, an error occurs when executed.

Return	None
Default	None
Menu	Cal > Basic Cal > Response(Thru) > Isolation-Load(Optional) Cal > Basic Cal > Enhanced Response > Isolation-Load(Optional) Cal > Basic Cal > SOLT > Isolation-Load(Optional) Cal > Basic Cal > SOLR > Isolation-Load(Optional)
Example	:SENSe1:CORRection:COLLect:ISOLation 1,2

3.3.1.1.20 Measure TRL Calibration Thru Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLThru <pnum1>,<pnum2>
Instruction	This command executes THRU measurement of the TRL calibration for the selected calibration kit, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number. If you specify the same port number to 2 port numbers, an error occurs when executed.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL > Thru
Example	:SENSe1:CORRection:COLLect:TRLThru 1,2

3.3.1.1.21 Measure TRL Calibration Reflect Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLReflect <pnum>
Instruction	This command executes the reflection measurement of the TRL calibration for the selected calibration kit, for the selected channel.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL > Reflect
Example	:SENSe1:CORRection:COLLect:TRLReflect 1

3.3.1.1.22 Measure TRL Calibration Line Data

Command Format	:SENSe<cnum>:CORRection:COLLect[:ACQuire]:TRLLine <pnum1>,<pnum2>
Instruction	This command executes LINE or MATCH measurement of the TRL calibration for the selected calibration kit, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number. If you specify the same port number to 2 port numbers, an error occurs when executed.
Return	None
Default	None
Menu	Cal > Basic Cal > TRL > Line
Example	:SENSe1:CORRection:COLLect:TRLLine 3,4

3.3.1.1.23 Clear Error Coefficient

Command Format	:SENSe<cnum>:CORRection:CLEar
Instruction	This command clears the error coefficient for calibration of the select channel.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:CLEar

3.3.1.1.24 Error Coefficient Data

Command Format	:SENSe<cnum>:CORRection:COEFficient[:DATA] <type>,<numeric 1>,<numeric 2>,<numeric 3>,...,<numeric 2+n*2> :SENSe<cnum>:CORRection:COEFficient[:DATA]? <type>,<numeric 1>,<numeric 2>
Instruction	This command sets/gets the calibration coefficient data for specified channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={ES|ER|ED|EL|ET|EX}: error type "ES": Source match "ER": Reflection tracking "ED": Directivity "EL": Load match "ET": Transmission tracking "EX": Isolation <numeric 1>: Response port Integer. Range: 1~4 If ES, ER, or ED is used, the response port and the stimulus port must be the same, while EL, ET, or EX is used, the response port and the stimulus port must be different. <numeric 2>: Stimulus port

	Integer. Range: 1~4 <numeric 3>,...,<numeric 2+n*2>: error coefficient Indicates the array data (formatted data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2): Data (primary value) at the n-th measurement point. Data(n×2-1): Data (secondary value) at the n-th measurement point. Always 0 when the data format is not the Smith chart format or the polar format. The index of the array starts from 0.
Return	Indicates the array data (formatted data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2): Data (primary value) at the n-th measurement point. Data(n×2-1): Data (secondary value) at the n-th measurement point. Always 0 when the data format is not the Smith chart format or the polar format. The index of the array starts from 0.
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:THRU 2,1 :SENSe1:CORRection:COEFficient ET,2,1,-1,0,-0.5,0,0.5,0 :SENSe1:CORRection:COEFficient:SAVE :SENSe1:CORRection:COEFficient? ET,2,1 Return: -1.000000000000e+00,0.000000000000e+00, -5.000000000000e-01,0.000000000000e+00, 5.000000000000e-01,0.000000000000e+00

3.3.1.1.25 Import Response(Open) Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:OPEN <pnum>
Instruction	This command sets the calibration type to the response calibration (open) of the specified port when the calibration coefficient data array is written with the SENSe<cnum>:CORRection:COEFficient:DATA

	command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:OPEN 1

3.3.1.1.26 Import Response(Short) Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:SHORt <pnum>
Instruction	This command sets the calibration type to the response calibration (short) of the specified port when the calibration coefficient data array is written with the SENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:SHORt 1

3.3.1.1.27 Import Response(Thru) Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod[:RESPonse]:THRU <pnum1>,<pnum2>
Instruction	This command sets the calibration type to the response calibration(thru) between the two specified ports when the calibration coefficient data array is written with the

	SENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:THRU 1,2

3.3.1.1.28 Import Enhanced Response Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod:ERESponse <pnum1>,<pnum2>
Instruction	This command sets the calibration type to the enhanced response calibration between the two specified ports when the calibration coefficient data array is written with the SENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:ERESponse 1,2

3.3.1.1.29 Import 1 Port SOLT Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT1 <pnum>
Instruction	This command sets the calibration type to the full 1-port calibration of the specified port, when the calibration coefficient data array is written with theSENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:SOLT1 1

3.3.1.1.30 Import 2 Port SOLT Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT2 <pnum1>,<pnum2>
Instruction	This command sets the calibration type to full 2-port calibration between the two specified ports, when the calibration coefficient data array is written with theSENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 2-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 2-port calibration.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:SOLT2 1,2

3.3.1.1.31 Import 3 Port SOLT Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT3 <pnum1>,<pnum2>,<pnum3>
Instruction	This command sets the calibration type to full 3-port calibration between the three specified ports, when the calibration coefficient data array is written with theSENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 3-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 3-port calibration. <pnum3>:={1|2|3|4}, specifies a port for full 3-port calibration.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:SOLT3 1,2,4

3.3.1.1.32 Import 4 Port SOLT Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:METHod:SOLT4 <pnum1>,<pnum2>,<pnum3>,<pnum4>
Instruction	This command sets the calibration type to full 4-port calibration between the four specified ports, when the calibration coefficient data array is written with theSENSe<cnum>:CORRection:COEFficient:DATA command, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 4-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 4-port calibration. <pnum3>:={1|2|3|4}, specifies a port for full 4-port calibration.

	<pnum4>:={1|2|3|4}, specifies a port for full 4-port calibration.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:METHod:SOLT4 1,2,3,4

3.3.1.1.33 Save Error Coefficient Data

Command Format	:SENSe<cnum>:CORRection:COEFficient:SAVE
Instruction	This command enables the calibration coefficients depending on the selected calibration type from the writing calibration data. If you execute this command before all calibration data needed for calculating the calibration coefficients are written, an error occurs and the command is ignored.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COEFficient:SAVE

3.3.1.1.34 Save Partially Rewritten Calibration Data

Command Format	:SENSe<cnum>:CORRection:COLLect:PARTial:SAVE
Instruction	This command is used for partial overwrite, recalculates the calibration coefficients depending on the selected calibration type from the measured calibration data.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None

Menu	Cal > Basic Cal > Overwrite
Example	:SENSe1:CORRection:COLLect:PARTial:SAVE

3.3.1.2 Cal Kit

3.3.1.2.1 Command List

Label of Cal Kit	:SENSe<cnum>:CORRection:COLLect:CKIT:LABel
Standard for Open Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:OPEN
Standard for Short Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:SHORt
Standard for Load Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:LOAD
Standard for Thru Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:THRU
Standard for TRL Line Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLLine
Standard for TRL Reflect	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLReflect
Standard for TRL Thru Measurement	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLThru
Reset Cal Kit	:SENSe:CORRection:COLLect:CKIT:RESet
Select Cal Kit	:SENSe:CORRection:COLLect:CKIT[:SELect]
Standard Type	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:TYPE
C0 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C0
C1 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C1
C2 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C2
C3 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C3
L0 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L0
L1 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L1
L2 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L2
L3 Value of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L3
Label of Cal Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:LABel
Delay of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:DELay
Min Frequency of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMINimum

Max Frequency of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMAXimum
Loss of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:LOSS
Z0 of the Standard	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:Z0
TRL Reference Impedance	:SENSe:CORRection:COLLect:CKIT:TRLoption:IMPedance
TRL Calibration Plane	:SENSe:CORRection:COLLect:CKIT:TRLoption:RPLane

3.3.1.2.2 Label of Cal Kit

Command Format	:SENSe<cnum>:CORRection:COLLect:CKIT:LABel <string> :SENSe<cnum>:CORRection:COLLect:CKIT:LABel?
Instruction	This command sets/gets the calibration kit name for the calibration kit selected, for selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <string>: represents the calibration kit name.
Return	String
Default	None
Menu	Cal > Cal Kit > Edit > Cal Kit Name
Example	:SENSe1:CORRection:COLLect:CKIT:LABel "F503ME_1" :SENSe1:CORRection:COLLect:CKIT:LABel? Return: F503ME_1

3.3.1.2.3 Standard for Open Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:OPEN <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:OPEN?
Instruction	This command sets/gets the standard(s) used for the open measurement for a calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.

Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > SOLT > OPEN
Example	:SENSe:CORRection:COLLect:CKIT:ORDer:OPEN 2,3 :SENSe:CORRection:COLLect:CKIT:ORDer:OPEN? Return: 2,3

3.3.1.2.4 Standard for Short Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:SHORt <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:SHORt?
Instruction	This command sets/gets the standard(s) used for the short measurement, for a calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > SOLT > SHORT
Example	:SENSe1:CORRection:COLLect:CKIT:ORDer:SHORt 3 :SENSe1:CORRection:COLLect:CKIT:ORDer:SHORt? Return: 3

3.3.1.2.5 Standard for Load Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:LOAD <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:LOAD?
Instruction	This command sets/gets the standard(s) used for the load measurement for a calibration kit selected.

Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > SOLT > LOAD
Example	:SENSe:CORRection:COLLect:CKIT:ORDer:LOAD 2 :SENSe:CORRection:COLLect:CKIT:ORDer:LOAD? Return: 2

3.3.1.2.6 Standard for Thru Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:THRU <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:THRU?
Instruction	This command sets/gets the standard(s) used for the thru measurement, for the calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > SOLT > THRU
Example	:SENSe1:CORRection:COLLect:CKIT:ORDer:THRU 4,2 :SENSe1:CORRection:COLLect:CKIT:ORDer:THRU? Return: 4,2

3.3.1.2.7 Standard for TRL Line Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLLine <numeric1>{,<numeric2>,…,<numeric n>}

	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLLine?
Instruction	This command sets/gets the standard used for the line measurement of TRL calibration, for the calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > TRL > LINE/MATCH
Example	:SENSe1:CORRection:COLLect:CKIT:ORDer:TRLLine 2 :SENSe1:CORRection:COLLect:CKIT:ORDer:TRLLine? Return: 2

3.3.1.2.8 Standard for TRL Reflect

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLReflect <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:TRLReflect?
Instruction	This command sets/gets the standard used for the reflection measurement of the TRL calibration, for the calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > TRL > REFLECT
Example	:SENSe1:CORRection:COLLect:CKIT:ORDer:TRLReflect 3 :SENSe1:CORRection:COLLect:CKIT:ORDer:TRLReflect? Return: 3

3.3.1.2.9 Standard for TRL Thru Measurement

Command Format	:SENSe:CORRection:COLLect:CKIT:ORDer:TRLThru <numeric1>{,<numeric2>,…,<numeric n>} :SENSe:CORRection:COLLect:CKIT:ORDer:TRLThru?
Instruction	This command sets/gets the standard used for the thru measurement of TRL calibration, for the calibration kit selected.
Parameter Type	<numeric1>{,<numeric2>,…,<numeric n>}:specifies the order of standard, and the parameter range: 1~21.
Return	Integer or array
Default	None
Menu	Cal > Cal Kit > Edit > TRL > THRU
Example	:SENSe1:CORRection:COLLect:CKIT:ORDer:TRLThru 3 :SENSe1:CORRection:COLLect:CKIT:ORDer:TRLThru? Return: 3

3.3.1.2.10 Reset Cal Kit

Command Format	:SENSe:CORRection:COLLect:CKIT:RESet
Instruction	This command resets the calibration kit selected to the default factory setting state.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:SENSe:CORRection:COLLect:CKIT 2 :SENSe:CORRection:COLLect:CKIT:ORDer:OPEN 1,3 :SENSe:CORRection:COLLect:CKIT:RESet :SENSe:CORRection:COLLect:CKIT:ORDer:OPEN? Return: 2

3.3.1.2.11 Select Cal Kit

Command Format	:SENSe:CORRection:COLLect:CKIT[:SELect] <numeric> :SENSe:CORRection:COLLect:CKIT[:SELect]?
Instruction	This command sets/gets the order of the selected calibration kit.
Parameter Type	<numeric>:represents the order of the selected calibration kit, and the parameter range: 1~32.
Return	Integer
Default	1
Menu	None
Example	:SENSe:CORRection:COLLect:CKIT 2 :SENSe:CORRection:COLLect:CKIT? Return: 2

3.3.1.2.12 Standard Type

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:TYPE <type> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:TYPE?
Instruction	This command sets/gets the standard type for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <type>:= {OPEN|SHORt|LOAD|THRU}
Return	Enumeration
Default	OPEN
Menu	Cal > Cal Kit > Edit Kit > Standards > Add > Add Standard
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:TYPE LOAD :SENSe:CORRection:COLLect:CKIT:STAN1:TYPE? Return: LOAD

3.3.1.2.13 C0 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C0 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:C0?
Instruction	This command sets/gets the C0 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the C0 value.
Return	Float Unit: fF (femto farad), 1E-15 F (farad)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Open Characteristics > C0
Example	:SENSe:CORRection:COLLect:CKIT:STAN2:C0 100 :SENSe:CORRection:COLLect:CKIT:STAN2:C0? Return: 100

3.3.1.2.14 C1 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C1 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:C1?
Instruction	This command sets/gets the C1 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the C1 value.
Return	Float Unit: 1E-27 F/Hz (1E-27 farad / hertz)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Open Characteristics > C1
Example	:SENSe:CORRection:COLLect:CKIT:STAN2:C1 12.3 :SENSe:CORRection:COLLect:CKIT:STAN2:C1?

	Return: 12.3

3.3.1.2.15 C2 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C2 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:C2?
Instruction	This command sets/gets the C2 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the C2 value.
Return	Float Unit: 1E-36 F/Hz^2 (1E-36 farad /hertz^2)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Open Characteristics > C2
Example	:SENSe:CORRection:COLLect:CKIT:STAN2:C2 25 :SENSe:CORRection:COLLect:CKIT:STAN2:C2? Return: 25

3.3.1.2.16 C3 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:C3 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:C3?
Instruction	This command sets/gets the C3 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the C3 value.
Return	Float Unit: 1E-45 F/Hz^3 (1E-45 farad / hertz^3)
Default	None

Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Open Characteristics > C3
Example	:SENSe:CORRection:COLLect:CKIT:STAN2:C3 12.3 :SENSe:CORRection:COLLect:CKIT:STAN2:C3? Return: 12.3

3.3.1.2.17 L0 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L0 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:L0?
Instruction	This command sets/gets the L0 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the L0 value.
Return	Float Unit: pH (pico henry)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Short Characteristics > L0
Example	:SENSe:CORRection:COLLect:CKIT:STAN3:L0 10 :SENSe:CORRection:COLLect:CKIT:STAN3:L0? Return: 10

3.3.1.2.18 L1 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L1 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:L1?
Instruction	This command sets/gets the L1 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the L1 value.

Return	Float Unit: 1E-24 H/Hz (1E-24 henry / hertz)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Short Characteristics > L1
Example	:SENSe:CORRection:COLLect:CKIT:STAN3:L1 12.3 :SENSe:CORRection:COLLect:CKIT:STAN3:L1? Return: 12.3

3.3.1.2.19 L2 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L2 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:L2?
Instruction	This command sets/gets the L2 value of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the L2 value.
Return	Float Unit: 1E-33 H/Hz^2 (1E-33 henry / hertz^2)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Short Characteristics > L2
Example	:SENSe:CORRection:COLLect:CKIT:STAN3:L2 12.3 :SENSe:CORRection:COLLect:CKIT:STAN3:L2? Return: 12.3

3.3.1.2.20 L3 Value of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:L3 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:L3?
Instruction	This command sets/gets the L3 value of the selected standard, for the

	calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the L3 value.
Return	Float Unit: 1E-42 H/Hz^3 (1E-42 henry / hertz^3)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Short Characteristics > L3
Example	:SENSe:CORRection:COLLect:CKIT:STAN3:L3 12.3 :SENSe:CORRection:COLLect:CKIT:STAN3:L3? Return: 12.3

3.3.1.2.21 Label of Cal Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:LABel <string> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:LABel?
Instruction	This command sets/gets the name of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <string>: represents the name of the selected standard.
Return	String
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Label
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:LABel "LOAD_1" :SENSe:CORRection:COLLect:CKIT:STAN1:LABel? Return: LOAD_1

3.3.1.2.22 Delay of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:DELay <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:DELay?
Instruction	This command sets/gets the value of the offset delay of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the value of the offset delay.
Return	Float Unit: s (second)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Delay Characteristics > Delay
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:DELay 1 :SENSe:CORRection:COLLect:CKIT:STAN1:DELay? Return: 1

3.3.1.2.23 Min Frequency of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMINimum <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMINimum?
Instruction	This command sets/gets the value of the start frequency of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the value of the start frequency.
Return	Float Unit: Hz (hertz)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Frequency Range > MIN
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:FMINimum 500e6

	:SENSe:CORRection:COLLect:CKIT:STAN1:FMINimum? Return: 500000000

3.3.1.2.24 Max Frequency of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMAXimum <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:FMAXimum?
Instruction	This command sets/gets the value of the stop frequency of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the value of the stop frequency.
Return	Float Unit: Hz (hertz)
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Frequency Range > Max
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:FMAXimum 4.5e9 :SENSe:CORRection:COLLect:CKIT:STAN1:FMAXimum? Return: 4500000000

3.3.1.2.25 Loss of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:LOSS <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:LOSS?
Instruction	This command sets/gets the value of the loss of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the value of the loss.
Return	Float

	Unit: ohm/s
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Delay Characteristics > Loss
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:LOSS 0.5 :SENSe:CORRection:COLLect:CKIT:STAN1:LOSS? Return: 0.5

3.3.1.2.26 Z0 of the Standard

Command Format	:SENSe:CORRection:COLLect:CKIT:STAN<snum>:Z0 <numeric> :SENSe:CORRection:COLLect:CKIT:STAN<snum>:Z0?
Instruction	This command sets/gets the value of the offset Z0 of the selected standard, for the calibration kit selected.
Parameter Type	<snum>:= {[1]-30}: represents the standard serial number of the calibration kit. <numeric>:represents the value of the offset Z0.
Return	Float Unit: ohm
Default	None
Menu	Cal > Cal Kit > Edit Kit > Standards > Edit > Delay Characteristics > Z0
Example	:SENSe:CORRection:COLLect:CKIT:STAN1:Z0 75 :SENSe:CORRection:COLLect:CKIT:STAN1:Z0? Return: 75

3.3.1.2.27 TRL Reference Impedance

Command Format	:SENSe:CORRection:COLLect:CKIT:TRLoption:IMPedance <type> :SENSe:CORRection:COLLect:CKIT:TRLoption:IMPedance?
Instruction	This command sets/gets the reference impedance during the TRL calibration.

Parameter Type	<type>:= {LINE|SYSTem}
Return	Enumeration
Default	SYSTem
Menu	Cal > Cal Kit > Edit Kit > TRL > Calibration Reference Z0
Example	:SENSe:CORRection:COLLect:CKIT:TRLoption:IMPedance LINE :SENSe:CORRection:COLLect:CKIT:TRLoption:IMPedance? Return: LINE

3.3.1.2.28 TRL Calibration Plane

Command Format	:SENSe:CORRection:COLLect:CKIT:TRLoption:RPLane <type> :SENSe:CORRection:COLLect:CKIT:TRLoption:RPLane?
Instruction	This command sets/gets the reference plane during the TRL calibration.
Parameter Type	<type>:= {THRU|REFLect}
Return	Enumeration
Default	THRU
Menu	Cal > Cal Kit > Edit Kit > TRL > Test Port reference Plane
Example	:SENSe:CORRection:COLLect:CKIT:TRLoption:RPLane REFLect :SENSe:CORRection:COLLect:CKIT:TRLoption:RPLane? Return: REFL

3.3.1.3 Cal Correction

3.3.1.3.1 Command List

Correction State	:SENSe<cnum>:CORRection:STATe
Power Calibration Correction State	:SOURce<cnum>:POWer:PORT<pnum>:CORRection[:STATe]
Power Calibration	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:DATA

Correction Data	
Take Cal Sweep	:SOURce{<cnum>:POWer:PORT<pnum>:CORRection:COLLect[:ACQuire]
Max Iteratin Count	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:ITERation[:COUNt]
Num of Readings	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:AVERage[:COUNt]
Loss Compensation State	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS[:STATe]
Loss Compensation Data	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS:DATA

3.3.1.3.2 Correction State

Command Format	:SENSe<cnum>:CORRection:STATe <bool> :SENSe<cnum>:CORRection:STATe?
Instruction	This turns ON/OFF or gets the status of the error correction of selected channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Cal > Correction
Example	:SENSe1:CORRection:STATe ON :SENSe1:CORRection:STATe? Return: 1

3.3.1.3.3 Power Calibration Correction State

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection[:STATe] <bool>

	:SOURce<cnum>:POWer:PORT<pnum>:CORRection[:STATe]?
Instruction	This command turns ON/OFF or returns the status of the power level error correction, for the selected port of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Cal > Power Cal…
Example	:SOURce1:POWer:PORT1:CORRection ON :SOURce1:POWer:PORT1:CORRection? Return: 1

3.3.1.3.4 Power Calibration Correction Data

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:DATA <numeric 1>, ..,<numeric NOP> :SOURce<cnum>:POWer:PORT<pnum>:CORRection:DATA?
Instruction	This command sets/gets the power calibration data array, for the selected port of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric 1>, ..,<numeric NOP>: Indicates the array data (power calibration data array) of NOP (number of points). Where n is an integer between 1 and NOP. Data(n-1): Data at the n-th measurement point The index of the array starts from 0.
Return	Data array
Default	None

Menu	None
Example	:SENSe1:SWEep:POINts 5 :SOURce1:POWer:PORT2:CORRection:DATA 1,2,3,4,5 :SOURce1:POWer:PORT2:CORRection:DATA? Return: 1,2,3,4,5

3.3.1.3.5 Take Cal Sweep

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect[:ACQuire]
Instruction	This command excute the power calibration of select port. When the measurement is complete successfully, the power level error correction is automatically turned ON.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None
Menu	Cal > Power Cal > Take Cal Sweep
Example	:SOURce1:POWer:PORT2:CORRection:COLLect

3.3.1.3.6 Max Iteratin Count

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:ITERation[:COUNt] <numeric> :SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:ITERation[:COUNt]?
Instruction	This command sets/gets the maximum number of readings to take at each source power data point for the selected port and channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2}, specifies the measurement port number.

	<numeric>:represents the maximum number of readings to take at each source power data point, and the parameter range: 0~50.
Return	Interger
Default	0
Menu	Cal > Power Cal > Max Iteration
Example	:SOURce1:POWer:PORT2:CORRection:COLLect:ITERation 10 :SOURce1:POWer:PORT2:CORRection:COLLect:ITERation? Return: 10

3.3.1.3.7 Num of Readings

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:AVERage[:COUNt] <numeric> :SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:AVERage[:COUNt]?
Instruction	This command sets/gets the number of power calibration data measurements per measurement point for the selected port of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2}, specifies the measurement port number. <numeric>:represents the number of power calibration data measurements per measurement point, and the parameter range: 1~50.
Return	Interger
Default	1
Menu	Cal > Power Cal > Num of Readings
Example	:SOURce1:POWer:PORT2:CORRection:COLLect:AVERage 5 :SOURce1:POWer:PORT2:CORRection:COLLect:AVERage? Return: 5

3.3.1.3.8 Loss Compensation State

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS[:STATe] <bool> :SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS[:STATe]?
Instruction	This command turns ON/OFF or returns the status of the loss compensation, for the selected port of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Power Cal > Loss Compen Off > Power Loss Compensation > Compensation On
Example	:SOURce1:POWer:PORT2:CORRection:COLLect:TABLe:LOSS ON :SOURce1:POWer:PORT2:CORRection:COLLect:TABLe:LOSS? Return: 1

3.3.1.3.9 Loss Compensation Data

Command Format	:SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS:DATA <numeric 1>,...,<numeric 1+(Nx2)> :SOURce<cnum>:POWer:PORT<pnum>:CORRection:COLLect:TABLe:LOSS:DATA?
Instruction	This command sets/gets the loss compensation table, for the selected port of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number <numeric 1>,...,<numeric 1+(Nx2)>:.

	Indicates the array data (for the loss compensation table) of 1 + Num (number of set data items)X2. Where n is an integer between 1 and Num. Data(0):The number of data items you want to set. Specify an integer between 0 to 100. When you set the number of data items to 0 (to clear the loss compensation table), you specify only Data(0) as the Data variable. Data(nX2-1):The frequency of the n-th data item (1 kHz to 500 GHz). Data(nX2):The loss of the n-th data item (-100 dB to 100 dB). The index of the array starts from 0.
Return	Data array
Default	None
Menu	Cal > Power Cal > Loss Compen Off > Power Loss Compensation
Example	:SOURce1:POWer:PORT2:CORRection:COLLect:TABLe:LOSS:DATA 2,2e9,3,5e9,-0.5 :SOURce1:POWer:PORT2:CORRection:COLLect:TABLe:LOSS:DATA? Return: 2,2e+09,3,5e+09,-0.5

3.3.2 Port Extension

3.3.2.1 Command List

State of Port Extension	:SENSe<cnum>:CORRection:EXTension[:STATe]
Delay Time of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:TIME
Delay Distance of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTance
Distance Unit of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTANCE:UNIT
Velocity of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:VELFactor
State of Velocity Couple	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:SYSVelocity

DC Loss of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LDC
State of Loss Value and Frequency Value	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:INCLude<type>[:STATe]
Loss Value of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LOSS
Frequency 1 or 2 of Port Extension	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:FREQuency
Clear Port Extension Data	:SENSe<cnum>:CORRection:EXTension:AUTO:RESet
Calculate Method for Auto Port Extension	:SENSe<cnum>:CORRection:EXTension:AUTO:CONFig
State of the Loss Compensation	:SENSe<cnum>:CORRection:EXTension:AUTO:LOSS
Adjust for Mismatch State	:SENSe<cnum>:CORRection:EXTension:AUTO:DCOFfset
User Span Start Frequency	:SENSe<cnum>:CORRection:EXTension:AUTO:STARt
User Span Stop Frequency	:SENSe<cnum>:CORRection:EXTension:AUTO:STOP
Madia Type	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:MEDium
Cuttoff Freq of Waveguide	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:WGCutoff
Couple To System Media Definition	:SENSe<cnum>:CORRection:EXTension:PORT:SYSMedia

3.3.2.2 State of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension[:STATe] <bool> :SENSe<cnum>:CORRection:EXTension[:STATe]?
Instruction	This command turns ON/OFF or returns the status of the port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Port Extension > Port Extension
Example	:SENSe1:CORRection:EXTension ON :SENSe1:CORRection:EXTension? Return: 1

3.3.2.3 Delay Time of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:TIME <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:TIME?
Instruction	This command sets or gets the value of the delay time for the port extension of ports 1 and 4, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric>:represents the value of the delay time, and the parameter range: 0~10s.
Return	Float, unit s(second)
Default	0
Menu	Cal > Port Extension > Time
Example	:SENSe1:CORRection:EXTension:PORT1:TIME 5 :SENSe1:CORRection:EXTension:PORT1:TIME? Return: 5

3.3.2.4 Delay Distance of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTance

	<numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTance?
Instruction	This command sets and returns the port extension delay in physical length (distance).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric>:represents the port extension delay in physical length (distance).
Return	Float, unit m(meter), or ft(feet), or in(inches)
Default	0
Menu	Cal > Port Extension > Distance
Example	:SENSe1:CORRection:EXTension:PORT1:DISTance 1 :SENSe1:CORRection:EXTension:PORT1:DISTance? Return: 1

3.3.2.5 Distance Unit of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTANCE:UNIT <type> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:DISTANCE:UNIT?
Instruction	This command Sets and returns the units for specifying port extension delay in physical length (distance).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <type>:={METers|FEET|INCHes}
Return	Enumeration
Default	METers
Menu	Cal > Port Extension > Port Extensions… > Delay > Distance Units

Example	:SENSe1:CORRection:EXTension:PORT1:DISTANCE:UNIT INCHes :SENSe1:CORRection:EXTension:PORT1:DISTANCE:UNIT? Return: INCH

3.3.2.6 Velocity of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:VELFactor <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:VELFactor?
Instruction	This command sets or gets the value of Velocity coefficient, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric>:represents the value of Velocity coefficient, and the parameter range: 0 ~ 1.
Return	Float
Default	1
Menu	Cal > Port Extension > Velocity
Example	:SENSe1:CORRection:EXTension:PORT1:VELFactor 0.66 :SENSe1:CORRection:EXTension:PORT1:VELFactor? Return: 0.66

3.3.2.7 State of Velocity Couple

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:SYSVelocity <bool> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:SYSVelocity?
Instruction	This command sets or returns the state of coupling with the system Velocity Factor value.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Cal > Port Extension > Port Extensions... > Velocity > Couple to system Velocity Factor
Example	:SENSe1:CORRection:EXTension:PORT1:SYSVelocity 0 :SENSe1:CORRection:EXTension:PORT1:SYSVelocity? Return: 0

3.3.2.8 DC Loss of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LDC <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LDC?
Instruction	This command sets/gets the DC loss value of the port 1 to 4, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric>:represents the DC loss value, and the parameter range: -90 ~ 90dB.
Return	Float, unit dB
Default	0dB
Menu	Cal > Port Extension > DC Loss
Example	:SENSe1:CORRection:EXTension:PORT2:LDC 10 :SENSe1:CORRection:EXTension:PORT2:LDC? Return: 10

3.3.2.9 State of Loss Value and Frequency Value

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:INCLude<type>[:STATe] <bool> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:INCLude<type>[:STATe]
Instruction	This command turns ON/OFF the set of loss value and frequency value of include 1 and 2 of the port 1 to 4, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <type>:={[1]|2} <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Port Extension > Port Extensions… > Loss
Example	:SENSe1:CORRection:EXTension:PORT1:INCLude1 ON :SENSe1:CORRection:EXTension:PORT1:INCLude1? Return: 1

3.3.2.10 Loss Value of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LOSS<type> <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:LOSS<type>?
Instruction	This command sets/gets the loss value of the loss 1 to 4 of the port 1 to 4, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <type>:={[1]|2} <numeric>:represents the loss value, and the parameter range: -90 ~

	90dB.
Return	Float, unit dB
Default	0dB
Menu	Cal > Port Extension > Port Extensions… > Loss > Loss1 or Loss2
Example	:SENSe1:CORRection:EXTension:PORT1:LOSS1 2 :SENSe1:CORRection:EXTension:PORT1:LOSS1? Return: 2

3.3.2.11 Frequency 1 or 2 of Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:FREQuency<type> <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:FREQuency<type>?
Instruction	This command sets/gets the frequency used for calculation of the loss value of the frequency 1 and 2 of the selected port, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <type>:={[1]|2} <numeric>:represents the frequency.
Return	Double, unit: Hz
Default	1GHz
Menu	Cal > Port Extension > Port Extensions… > Loss > Freq1 or Freq2
Example	:SENSe1:CORRection:EXTension:PORT2:FREQuency2 2e9 :SENSe1:CORRection:EXTension:PORT2:FREQuency2? Return: 2000000000

3.3.2.12 Clear Port Extension Data

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:RESet
Instruction	This command clears old port extension delay and loss data in preparation for acquiring new data.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Cal > Port Extension > Port Extension… > Reset
Example	:SENSe1:CORRection:EXTension:AUTO:RESet

3.3.2.13 Calculate Method for Auto Port Extension

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:CONFig <type> :SENSe<cnum>:CORRection:EXTension:AUTO:CONFig?
Instruction	This command sets/gets the frequency point to calculate the auto port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={CSPN|AMKR|USPN}
Return	Enumeration
Default	CSPN
Menu	Cal > Port Extension > Automatic Port Extension > Method
Example	:SENSe1:CORRection:EXTension:AUTO:CONFig USPN :SENSe1:CORRection:EXTension:AUTO:CONFig? Return: USPN

3.3.2.14 State of the Loss Compensation

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:LOSS <bool> :SENSe<cnum>:CORRection:EXTension:AUTO:LOSS?
Instruction	This command turns ON/OFF or gets the status of the loss compensation for the results of the auto port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Cal > Port Extension > Automatic Port Extension > Setting > Include Loss
Example	:SENSe1:CORRection:EXTension:AUTO:LOSS OFF :SENSe1:CORRection:EXTension:AUTO:LOSS? Return: 0

3.3.2.15 Adjust for Mismatch State

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:DCOFfset <bool> :SENSe<cnum>:CORRection:EXTension:AUTO:DCOFfset?
Instruction	This command enables/disables or gets the usage of DC Offset value for the results of the auto port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Cal > Port Extension > Automatic Port Extension > Setting > Adjust for Mismatch
Example	:SENSe1:CORRection:EXTension:AUTO:DCOFfset 0

	:SENSe1:CORRection:EXTension:AUTO:DCOFfset? Return: 0

3.3.2.16 User Span Start Frequency

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:STARt <numeric> :SENSe<cnum>:CORRection:EXTension:AUTO:STARt?
Instruction	This command gets/sets the start frequency within the frequency range of the user specified auto port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float, unit: Hz
Default	100 kHz
Menu	Cal > Port Extension > Automatic Port Extension > User Span > Start
Example	:SENSe1:CORRection:EXTension:AUTO:STARt 1e6 :SENSe1:CORRection:EXTension:AUTO:STARt? Return: 1000000

3.3.2.17 User Span Stop Frequency

Command Format	:SENSe<cnum>:CORRection:EXTension:AUTO:STOP <numeric> :SENSe<cnum>:CORRection:EXTension:AUTO:STOP?
Instruction	This command get/set the stop frequency within the frequency range of the user specified auto port extension, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float, unit:Hz

Default	Maximum frequency of the analyzer
Menu	Cal > Port Extension > Automatic Port Extension > User Span > Stop
Example	:SENSe1:CORRection:EXTension:AUTO:STOP 1e9 :SENSe1:CORRection:EXTension:AUTO:STOP? Return: 1000000000

3.3.2.18 Madia Type

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT<pnum>:MEDium <type> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:MEDium?
Instruction	Sets and returns the media type of the added fixture or transmission line.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <type>:={COAX|WAVE}.
Return	String
Default	COAX
Menu	Cal > Port Extension > Port Extension… > Media
Example	:SENSe1:CORRection:EXTension:PORT1:MEDium WAVE :SENSe1:CORRection:EXTension:PORT1:MEDium? Return: WAVE

3.3.2.19 Cuttoff Freq of Waveguide

Command Format	SENSe<cnum>:CORRection:EXTension:PORT<pnum>:WGCutoff <numeric> :SENSe<cnum>:CORRection:EXTension:PORT<pnum>:WGCutoff?
Instruction	Sets and returns the cuttoff (minimum) frequency of the added

	waveguide fixture or transmission line.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number. <numeric>:Cutoff frequency in Hz.
Return	Float, unit:Hz
Default	45MHz
Menu	Cal > Port Extension > Port Extension… > Media > Port Cutoff Freq
Example	:SENSe1:CORRection:EXTension:PORT1:WGCutoff 100e3 :SENSe1:CORRection:EXTension:PORT1:WGCutoff? Return: 100000

3.3.2.20 Couple To System Media Definition

Command Format	:SENSe<cnum>:CORRection:EXTension:PORT:SYSMedia <bool> :SENSe<cnum>:CORRection:EXTension:PORT:SYSMedia?
Instruction	Sets and returns the state of coupling with the system Media type.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:=ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	1 or ON
Menu	Cal > Port Extension > Port Extension… > Media > Couple To System Media Definition
Example	:SENSe1:CORRection:EXTension:PORT:SYSMedia OFF :SENSe1:CORRection:EXTension:PORT:SYSMedia? Return: 0

3.3.3 Fixtures

3.3.3.1 Port Match

3.3.3.1.1 Command List

State of Fixture Simulator	:CALCulate<cnum>:FSIMulator:STATe
State of the Match Circuit Embedding Function	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:STATe
Touchstone Filename for The Matching Circuit Model	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:USER:FILename
Type of the Matching Circuit	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>[:TYPE]
C Value of the Matching Circuit	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:C<type>
L Value of the Matching Circuit	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:L<type>
R Value of the Matching Circuit	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:R<type>
G Value of the Matching Circuit	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:G<type>

3.3.3.1.2 State of Fixture Simulator

Command Format	:CALCulate<cnum>:FSIMulator:STATe <bool> :CALCulate<cnum>:FSIMulator:STATe?
Instruction	This command turns ON/OFF the fixture simulator function of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Apply Fixtures

Example	:CALCulate1:FSIMulator:STATe ON :CALCulate1:FSIMulator:STATe? Return: 1

3.3.3.1.3 State of the Match Circuit Embedding Function

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:STATe <bool> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:STATe?
Instruction	This command turns ON/OFF the matching circuit embedding function when the fixture simulator function is ON, for all the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > Port Matching
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:STATe ON :CALCulate1:FSIMulator:SENDed:PMCircuit:STATe? Return: 1

3.3.3.1.4 Touchstone Filename for The Matching Circuit Model

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:USER:FILename <string> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:USER:FILename?
Instruction	This command sets/gets the file in which the information on the user-defined matching circuit is saved (2-port touchstone file), for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<pnum>:={[1]-4}, specifies the measurement port number. <string>: represents the file in which the information on the user-defined matching circuit is saved (2-port touchstone file).
Return	None
Default	None
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Match S2P File
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:USER:FILename "local/test.s2p" :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:USER:FILename? Return: local/test.s2p

3.3.3.1.5 Type of the Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>[:TYPE] <type> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>[:TYPE]?
Instruction	This command sets/gets the type of the matching circuit, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={NONE|SLPC|PCSL|PLSC|SCPL|PLPC|SCPC|PCSC|SLPL|PLSL|USER}. "NONE": Specifies no-circuit. "SLPC": Specifies the circuit that consists of series L and shunt C. "PCSL": Specifies the circuit that consists of shunt C and series L. "PLSC": Specifies the circuit that consists of shunt L and series C. "SCPL": Specifies the circuit that consists of series C and shunt L. "PLPC": Specifies the circuit that consists of shunt L and shunt C. "SCPC": Specifies the circuit that consists of series C and shunt C. "PCSC": Specifies the circuit that consists of shunt C and series C.

	"SLPL": Specifies the circuit that consists of series L and shunt L. "PLSL": Specifies the circuit that consists of shunt L and series L. "USER": Specifies the user-defined circuit.
Return	Enumeration
Default	SLPC
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Circuit Model
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT PLSL :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1? Return: PLSL

3.3.3.1.6 C Value of the Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:C<type> <numeric> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:C<type>?
Instruction	This command sets/gets the C value of the matching circuit, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={[1]-2} <numeric>:represents the C value of the matching circuit.
Return	Float, unit F (farad)
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Circuit Model
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:C 10e-9 :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:C? Return: 1e-08

3.3.3.1.7 L Value of the Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:L<type> <numeric> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:L<type>?
Instruction	This command sets/gets the L value of the matching circuit, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={[1]-2} <numeric>:represents the L value of the matching circuit.
Return	Float, unit H (henry)
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Circuit Model
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:L1 5 :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:L1? Return: 5

3.3.3.1.8 R Value of the Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:R<type> <numeric> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:R<type>?
Instruction	This command sets/gets the R value of the matching circuit, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={[1]-2} <numeric>:represents the R value of the matching circuit.

Return	Float, unit ohm
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Circuit Model
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:R25 :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:R? Return: 25

3.3.3.1.9 G Value of the Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:G<type> <numeric> :CALCulate<cnum>:FSIMulator:SENDed:PMCircuit:PORT<pnum>:PARameters:G<type>?
Instruction	This command sets/gets the G value of the matching circuit, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={[1]-2} <numeric>:represents the G value of the matching circuit.
Return	Float, unit S (siemens)
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Port Matching > Circuit Model
Example	:CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:G10 :CALCulate1:FSIMulator:SENDed:PMCircuit:PORT1:PARameters:G1? Return: 10

3.3.3.2 Port Z...

3.3.3.2.1 Command List

State of Port Z Conversion	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:STATe
Impedance of Port Z Conversion	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:Z0[:R]
Impedance (Real) of Port Z Conversion	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:REAL
Impedance (Imaginary) of Port Z Conversion	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:IMAGinary

3.3.3.2.2 State of Port Z Conversion

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:STATe <bool> :CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:STATe?
Instruction	This command turns ON/OFF the port impedance conversion function when the fixture simulator function is ON, for all the ports of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > Port Z Conversion
Example	:CALCulate1:FSIMulator:SENDed:ZCONversion:STATe ON :CALCulate1:FSIMulator:SENDed:ZCONversion:STATe? Return: 1

3.3.3.2.3 Impedance of Port Z Conversion

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:Z0[:R] <numeric> :CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:Z0[:R]?
Instruction	This command sets/gets the impedance value for the port impedance conversion function, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the impedance value, and the parameter range: 0.001 to 1E7.
Return	Float, unit: ohm
Default	50
Menu	Cal > Fixtures > Fixtures Setup > Port Z Conversion > R
Example	:CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:Z0 100 :CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:Z0? Return: 100

3.3.3.2.4 Impedance (Real) of Port Z Conversion

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:REAL <numeric> :CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:REAL?
Instruction	This command sets/gets the impedance value (real part) for the port impedance conversion function, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the impedance value (real part), and the parameter range: 0.001 to 1E7.
Return	Float, unit: ohm

Default	50
Menu	Cal > Fixtures > Fixtures Setup > Port Z Conversion > R
Example	:CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:REAL 75 :CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:REAL? Return: 75

3.3.3.2.5 Impedance (Imaginary) of Port Z Conversion

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:IMAGinary <numeric> :CALCulate<cnum>:FSIMulator:SENDed:ZCONversion:PORT<pnum>:IMAGinary?
Instruction	This command sets/gets the impedance value (imaginary part) for the port impedance conversion function, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the impedance value (imaginary part), and the parameter range: -1E+18 ~ 1E+18.
Return	Float, unit: ohm
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Port Z Conversion > jX
Example	:CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:IMAGinary 100 :CALCulate1:FSIMulator:SENDed:ZCONversion:PORT1:IMAGinary? Return: 100

3.3.3.3 2-Port DeEmbed

3.3.3.3.1 Command List

State of the Network	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:STATe

De-embedding Function	
Type of the Network De-embedding Function	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>[:TYPE]
Touchstone Filename for the Network De-embedding Function	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:USER:FILename
State of the Reverse Adapter Ports	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:SNP:REVerse

3.3.3.3.2 State of the Network De-embedding Function

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:STATe <bool> :CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:STATe?
Instruction	This command turns ON/OFF the network de-embedding function when the fixture simulator function is ON, for all the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > 2 Port De-embedding
Example	:CALCulate1:FSIMulator:SENDed:DEEMbed:STATe ON :CALCulate1:FSIMulator:SENDed:DEEMbed:STATe? Return: 1

3.3.3.3.3 Type of the Network De-embedding Function

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>[:TYPE] <type> :CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>[:T

	YPE]?
Instruction	This command sets/gets the type of the network de-embedding function, for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={NONE|USER} "NONE": Specifies no network de-embedding. "USER": Specifies the user-defined network de-embedding.
Return	Enumeration
Default	NONE
Menu	Cal > Fixtures > Fixtures Setup > 2 Port De-embedding > De-embedding Type
Example	:CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1 USER :CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1? Return: USER

3.3.3.3.4 Touchstone Filename for the Network De-embedding Function

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:USER:FILename <string> :CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:USER:FILename?
Instruction	This command sets/gets the file in which the information on the user-defined network for the network de-embedding function is saved (2-port touchstone file), for the ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <string>: represents the file in which the information on the user-defined network for the network de-embedding function is saved (2-port touchstone file).

Return	None
Default	None
Menu	Cal > Fixtures > Fixtures Setup > 2 Port De-embedding > Select De-embedding
Example	:CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1:USER:FILename "local/test.s2p" :CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1:USER:FILename? Return: local/test.s2p

3.3.3.3.5 State of the Reverse Adapter Ports

Command Format	:CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:SNP:REVerse <bool> :CALCulate<cnum>:FSIMulator:SENDed:DEEMbed:PORT<pnum>:SNP:REVerse?
Instruction	This command set and read whether or not to reverse ports on a 2-port fixture or adapter to be de-embedded.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > 2 Port De-embedding > Reverse Adapter Ports
Example	:CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1:SNP:REVerse ON :CALCulate1:FSIMulator:SENDed:DEEMbed:PORT1:SNP:REVerse? Return: 1

3.3.3.4 N- Port DeEmbed

3.3.3.4.1 Command List

State of 4 Port Network Embedding/De-embedding Feature	:CALCulate<cnum>:FSIMulator:EMBed:STATe
Connection Mode of 4 Port Network Embedding/De-embedding Feature	:CALCulate<cnum>:FSIMulator:EMBed:TYPE
Specifies Port Connections in Type A	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:A:PORTs
Specifies Port Connections in Type B	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:B:PORTs
Specifies Port Connections in Type C	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:C:PORTs
Processing Type of Network	:CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:TYPE
4 Port Touchstone Filename for the Network Embedding/De-embedding Feature	:CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:FILename

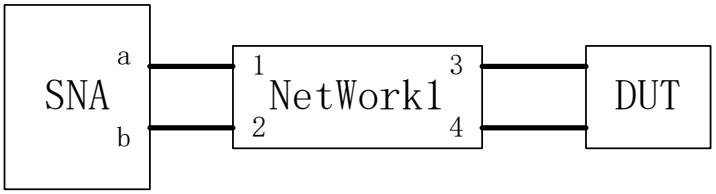
3.3.3.4.2 State of 4 Port Network Embedding/De-embedding Feature

Command Format	:CALCulate<cnum>:FSIMulator:EMBed:STATe <bool> :CALCulate<cnum>:FSIMulator:EMBed:STATe?
Instruction	This command turns ON/OFF the 4-port network embedding/de-embedding feature when the fixture simulator feature is ON, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:STATe ON :CALCulate1:FSIMulator:EMBed:STATe? Return: 1

3.3.3.4.3 Connection Mode of 4 Port Network Embedding/De-embedding Feature

Command Format	:CALCulate<cnum>:FSIMulator:EMBed:TYPE <type> :CALCulate<cnum>:FSIMulator:EMBed:TYPE?
Instruction	This command selects a connection type (Topology), for the 4-port network embedding/de-embedding feature for channels.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={A|B|C} "A":Specifies connection type A. "B":Specifies connection type B. "C":Specifies connection type C.
Return	Enumeration
Default	A
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed > Topology
Example	:CALCulate1:FSIMulator:EMBed:TYPE B :CALCulate1:FSIMulator:EMBed:TYPE? Return: B

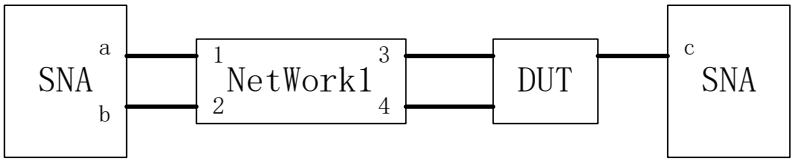
3.3.3.4.4 Specifies Port Connections in Type A



Command Format	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:A:PORTs <numeric1>,<numeric 2> :CALCulate<cnum>:FSIMulator:EMBed:TOPology:A:PORTs?
Instruction	This command sets/gets the test port assignment when the connection type (Topology) is set to A, for the 4-port network

	embedding/de-embedding feature for selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric1>: VNA Port number assigned to a in above graphic. <numeric2>: VNA Port number assigned to b in above graphic.
Return	Data array
Default	1,2
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:TOPology:A:PORTs 2,1 :CALCulate1:FSIMulator:EMBed:TOPology:A:PORTs? Return: 2,1

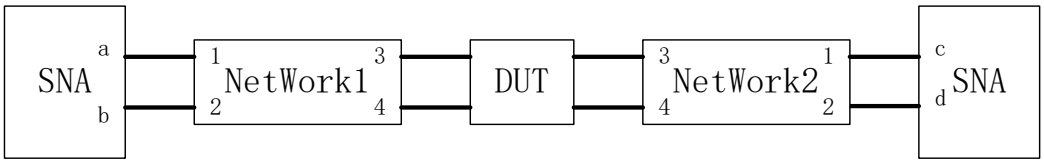
3.3.3.4.5 Specifies Port Connections in Type B



Command Format	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:B:PORTs <numeric1>,<numeric2>,<numeric3> :CALCulate<cnum>:FSIMulator:EMBed:TOPology:B:PORTs?
Instruction	This command sets/gets test port assignment when the connection type (Topology) is set to B, for the 4-port network embedding/de-embedding feature for selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric1>: VNA Port number assigned to a in above graphic. <numeric2>: VNA Port number assigned to b in above graphic. <numeric3>: VNA Port number assigned to c in above graphic.
Return	Data array
Default	1,2,3

Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:TOPology:B:PORTs 2,1,3 :CALCulate1:FSIMulator:EMBed:TOPology:B:PORTs? Return: 2,1,3

3.3.3.4.6 Specifies Port Connections in Type C



Command Format	:CALCulate<cnum>:FSIMulator:EMBed:TOPology:C:PORTs <numeric1>,<numeric2>,<numeric3>,<numeric4> :CALCulate<cnum>:FSIMulator:EMBed:TOPology:C:PORTs?
Instruction	This command sets/gets test port assignment when the connection type (Topology) is set to C, for the 4-port network embedding/de-embedding feature for selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric1>: VNA Port number assigned to a in above graphic. <numeric2>: VNA Port number assigned to b in above graphic. <numeric3>: VNA Port number assigned to c in above graphic. <numeric4>: VNA Port number assigned to d in above graphic.
Return	Data array
Default	1,2,3,4
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:TOPology:C:PORTs 2,1,3,4 :CALCulate1:FSIMulator:EMBed:TOPology:C:PORTs? Return: 2,1,3,4

3.3.3.4.7 Processing Type of Network

Command Format	:CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:TYPE <type> :CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:TYPE?
Instruction	This command sets/gets the processing type for networks, for the 4-port network embedding/de-embedding feature for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the network port number. <type>:={NONE|EMBed|DEEMbed} "NONE": Specifies no-processing. "EMBed": Specifies embedding. "DEEMbed": Specifies de-embedding.
Return	Enumeration
Default	NONE
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:NETWork1:TYPE DEEMbed :CALCulate1:FSIMulator:EMBed:NETWork1:TYPE? Return: DEEM

3.3.3.4.8 4 Port Touchstone Filename for the Network Embedding/De-embedding Feature

Command Format	:CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:FILename <string> :CALCulate<cnum>:FSIMulator:EMBed:NETWork<pnum>:FILename?
Instruction	This command specifies a file in which the information of network (which you want to embed/de-embed using the 4-port network embedding/de-embedding feature) is saved for the selected channel. The file is saved as a 4-port touchstone file with the ".s4p" extension.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the network port number.

	<string>: represents the file in which the information of network (which you want to embed/de-embed using the 4-port network embedding/de-embedding feature).
Return	None
Default	None
Menu	Cal > Fixtures > Fixtures Setup > 4/6/8-Port Embed/De-embed
Example	:CALCulate1:FSIMulator:EMBed:NETWork1:FILename "local/test.s4p" :CALCulate1:FSIMulator:EMBed:NETWork1:FILename? Return: local/test.s4p

3.3.3.5 Differential Port Match

3.3.3.5.1 Command List

State of the Differential Port Matching Function	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:STATe
Type of the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>[:TYPE]
Touchstone Filename for the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:USER:FILename
C Value of the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:C
L Value of the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:L
R Value of the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:R
G Value of the Differential Port Matching Circuit	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:G

3.3.3.5.2 State of the Differential Port Matching Function

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:STATe <bool>

	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:STATe?
Instruction	This command turns ON/OFF the differential port matching function when the fixture simulator function is ON, for all the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Enable Differential Port Matching
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:STATe ON :CALCulate1:FSIMulator:BALun:DMCircuit:STATe? Return: 1

3.3.3.5.3 Type of the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>[:TYPE] <type> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>[:TYPE]?
Instruction	This command sets/gets the type of the differential port matching circuit, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <type>:={NONE|PLPC|USER} "NONE": Specifies no-circuit. "PLPC": Specifies the circuit that consists of shunt L and shunt C. "USER": Specifies the user-defined circuit.
Return	Enumeration
Default	NONE

Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Select Circuit
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1 PLPC :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1? Return: PLPC

3.3.3.5.4 Touchstone Filename for the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:USER:FILename <string> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:USER:FILename?
Instruction	This command sets/gets the file in which the information on the user-defined network for the differential port matching function is saved (2-port touchstone file), for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <string>: represents the file in which the information on the user-defined network for the differential port matching function is saved (2-port touchstone file).
Return	String
Default	None
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Browse...
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:USER:FILename "local/test.s2p" :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:USER:FILename? Return: local/test.s2p

3.3.3.5.5 C Value of the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA

	Rameters:C <numeric> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA Rameters:C?
Instruction	This command sets/gets the C value of the differential port matching circuit, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the C value of the differential port matching circuit.
Return	Float, unit F (farad)
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Shunt L - Shunt C
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:C 1e-11 :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:C? Return: 1e-11

3.3.3.5.6 L Value of the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA Rameters:L <numeric> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA Rameters:L?
Instruction	This command sets/gets the L value of the differential port matching circuit, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the L value of the differential port matching circuit.
Return	Float, unit H (henry)

Default	0
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Shunt L - Shunt C
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:L 1e-8 :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:L? Return: 1e-8

3.3.3.5.7 R Value of the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:R <numeric> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PARameters:R?
Instruction	This command sets/gets the R value of the differential port matching circuit, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the R value of the differential port matching circuit.
Return	Float, unit ohm
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Shunt L - Shunt C
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:R 25 :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:R? Return: 25

3.3.3.5.8 G Value of the Differential Port Matching Circuit

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA

	Rameters:G <numeric> :CALCulate<cnum>:FSIMulator:BALun:DMCircuit:BPORt<pnum>:PA Rameters:G?
Instruction	This command sets/gets the G value of the differential port matching circuit, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the G value of the differential port matching circuit.
Return	Float, unit S (siemens)
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Differential Port Matching > Shunt L - Shunt C
Example	:CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:G 5e-2 :CALCulate1:FSIMulator:BALun:DMCircuit:BPORt1:PARameters:G? Return: 5e-2

3.3.3.6 Differential Z

3.3.3.6.1 Command List

State of the Differential Port Z Conversation Function	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:STATe
Impedance of the Differential Port	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:Z0[:R]
Impedance (Real) of the Differential Port	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:REAL
Impedance (Imaginary) of the Differential Port	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:IMAGinary

3.3.3.6.2 State of the Differential Port Z Conversation Function

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:STATe <bool> :CALCulate<cnum>:FSIMulator:BALun:DZConversion:STATe?
Instruction	This command turns ON/OFF the differential port impedance conversion function when the fixture simulator function is ON, for all the logical ports of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > Differential Z > Enable Differential Z Conversation
Example	:CALCulate1:FSIMulator:BALun:DZConversion:STATe ON :CALCulate1:FSIMulator:BALun:DZConversion:STATe? Return: 1

3.3.3.6.3 Impedance of the Differential Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:Z0[:R] <numeric> :CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:Z0[:R]?
Instruction	Sets or get the impedance value for the differential port impedance conversion function. Set either this single value or set the real and imaginary parts separately. The imaginary part is set to 0.0 using this command.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value, and the parameter range: 1E-3 ~ 1E7.

Return	Float, unit: ohm
Default	100
Menu	Cal > Fixtures > Fixtures Setup > Differential Z > R
Example	:CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:Z0 100 :CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:Z0? Return: 100

3.3.3.6.4 Impedance (Real) of the Differential Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:REAL <numeric> :CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:REAL?
Instruction	This command sets/gets the impedance value (real part) for the differential port impedance conversion function, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value (real part), and the parameter range: 1E-3 ~ 1E7.
Return	Float, unit: ohm
Default	100
Menu	Cal > Fixtures > Fixtures Setup > Differential Z > R
Example	:CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:REAL 100 :CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:REAL? Return: 100

3.3.3.6.5 Impedance (Imaginary) of the Differential Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>

	:IMAGinary <numeric> :CALCulate<cnum>:FSIMulator:BALun:DZConversion:BPORt<pnum>:IMAGinary?
Instruction	This command sets/gets the impedance value (imaginary part) for the differential port impedance conversion function, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value (imaginary part), and the parameter range: -1E+18 ~ 1E+18.
Return	Float, unit: ohm
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Differential Z > jX
Example	:CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:IMAGinary 100 :CALCulate1:FSIMulator:BALun:DZConversion:BPORt1:IMAGinary? Return: 100

3.3.3.7 Common Z

3.3.3.7.1 Command List

State of the Common Port Z Conversation Function	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:STATe
Impedance of the Common Port	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:Z0[:R]
Impedance (Real) of the Common Port	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:REAL
Impedance (Imaginary) of the Common Port	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:IMAGinary

3.3.3.7.2 State of the Common Port Z Conversation Function

Command Format	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:STATe <bool> :CALCulate<cnum>:FSIMulator:BALun:CZConversion:STATe?
Instruction	This command turns ON/OFF the common port impedance conversion function when the fixture simulator function is ON, for all the logical ports of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Cal > Fixtures > Fixtures Setup > Common Z > Enable Common Z Conversation
Example	:CALCulate1:FSIMulator:BALun:CZConversion:STATe ON :CALCulate1:FSIMulator:BALun:CZConversion:STATe? Return: 1

3.3.3.7.3 Impedance of the Common Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:Z0[:R] <numeric> :CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:Z0[:R]?
Instruction	Sets /get the impedance value for the differential port impedance conversion function. Set either this single value or set the real and imaginary parts separately. The imaginary part is set to 0.0 using this command.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value, and the parameter range: 1E-3 ~ 1E7.

Return	Float, unit: ohm
Default	25
Menu	Cal > Fixtures > Fixtures Setup > Common Z > R
Example	:CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:Z0 100 :CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:Z0? Return: 100

3.3.3.7.4 Impedance (Real) of the Common Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:REAL <numeric> :CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:REAL?
Instruction	This command sets/gets the impedance value (real part) for the common port impedance conversion function, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value (real part), and the parameter range: 1E-3 ~ 1E7.
Return	Float, unit: ohm
Default	25
Menu	Cal > Fixtures > Fixtures Setup > Common Z > R
Example	:CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:REAL 100 :CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:REAL? Return: 100

3.3.3.7.5 Impedance (Imaginary) of the Common Port

Command Format	:CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>

	:IMAGinary <numeric> :CALCulate<cnum>:FSIMulator:BALun:CZConversion:BPORt<pnum>:IMAGinary?
Instruction	This command sets/gets the impedance value (imaginary part) for the common port impedance conversion function, for the logical ports of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-2},specifies the logical port number. <numeric>:represents the impedance value (imaginary part), and the parameter range: -1E+18 ~ 1E+18.
Return	Float, unit: ohm
Default	0
Menu	Cal > Fixtures > Fixtures Setup > Common Z > jX
Example	:CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:IMAGinary 100 :CALCulate1:FSIMulator:BALun:CZConversion:BPORt1:IMAGinary? Return: 100

3.3.4 Ecal

3.3.4.1 Command List

Calibration Type	:SENSe<cnum>:CORRection:COLLect:METHod:TYPE?
ECal Execute 1 Port Calibration	:SENSe{[1]-256}:CORRection:COLLect:ECal:SOLT1
ECal Execute 2 Port Calibration	:SENSe{[1]-256}:CORRection:COLLect:ECal:SOLT2
ECal Execute 3 Port Calibration	:SENSe{[1]-256}:CORRection:COLLect:ECal:SOLT3
ECal Execute 4 Port Calibration	:SENSe{[1]-256}:CORRection:COLLect:ECal:SOLT4
ECal Execute Response Calibration	:SENSe<cnum>:CORRection:COLLect:ECal:THRU
ECal Execute Enhanced Response Calibration	:SENSe<cnum>:CORRection:COLLect:ECal:ERESponse

ECal Unknown Thru State	:SENSe<cnum>:CORRection:COLLect:ECal:UTHRU[:STATe]
ECal Confidence Check	:SENSe<cnum>:CORRection:COLLect:ECal:CCHeck[:ACQuire]
ECal Orientation	:SENSe<cnum>:CORRection:COLLect:ECal:IORIentation[:STATe]
ECal Characterization Information	:SENSe:CORRection:COLLect:ECal:INFormation?

3.3.4.2 Calibration Type

Command Format	:SENSe<cnum>:CORRection:COLLect:METHod:TYPE?
Instruction	This command gets the calibration type selected by the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	None
Example	:SENSe1:CORRection:COLLect:METHod:TRL4 1,2,3,4 :SENSe1:CORRection:COLLect:METHod:TYPE? Return: TRL4

3.3.4.3 ECal Execute 1 Port Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:SOLT1 <pnum>
Instruction	This command executes 1-port calibration of the specified port of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={1|2|3|4}, specifies the measurement port number.
Return	None
Default	None

Menu	Cal > ECal > ECal… > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:SOLT1 1

3.3.4.4 ECal Execute 2 Port Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:SOLT2 <pnum1>,<pnum2>
Instruction	This command executes full 2-port calibration between the specified 2 ports of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 2-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 2-port calibration. If you specify the same port number to 2 port numbers, an error occurs when executed. The order of the 2 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > ECal > ECal… > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:SOLT2 1,2

3.3.4.5 ECal Execute 3 Port Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:SOLT3 <pnum1>,<pnum2>,<pnum3>
Instruction	This command executes full 3-port calibration between the specified 3 ports of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 3-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 3-port calibration.

	<pnum3>:={1|2|3|4}, specifies a port for full 3-port calibration. If you specify the same port number to 3 port numbers, an error occurs when executed. the order of the 3 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > ECal > ECal... > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:SOLT3 1,2,3

3.3.4.6 ECal Execute 4 Port Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:SOLT4 <pnum1>,<pnum2>,<pnum3>,<pnum4>
Instruction	This command executes full 4-port calibration between the specified 4 ports of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies a port for full 4-port calibration. <pnum2>:={1|2|3|4}, specifies a port for full 4-port calibration. <pnum3>:={1|2|3|4}, specifies a port for full 4-port calibration. <pnum4>:={1|2|3|4}, specifies a port for full 4-port calibration. If you specify the same port number to 4 port numbers, an error occurs when executed. the order of the 4 port numbers to be specified is arbitrary.
Return	None
Default	None
Menu	Cal > ECal > ECal... > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:SOLT4 1,2,3,4

3.3.4.7 ECal Execute Response Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:THRU <pnum1>,<pnum2>
Instruction	This command executes response calibration between the two specified ports of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.
Return	None
Default	None
Menu	Cal > ECal > ECal… > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:THRU 1,2

3.3.4.8 ECal Execute Enhanced Response Calibration

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:ERESponse <pnum1>,<pnum2>
Instruction	This command executes enhanced response calibration between the two specified ports of selected channel using the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum1>:={1|2|3|4}, specifies the response port number. <pnum2>:={1|2|3|4}, specifies the stimulus port number.
Return	None
Default	None
Menu	Cal > ECal > ECal… > Cal Type
Example	:SENSe1:CORRection:COLLect:ECal:ERESponse 1,2

3.3.4.9 ECal Unknown Thru State

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:UTHRU[:STATe] <bool> :SENSe<cnum>:CORRection:COLLect:ECal:UTHRU[:STATe]?
Instruction	This command sets/gets Unknown Thru On/Off for ECal.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Cal > ECal > ECal… > Cal Type >Unknown Thru
Example	:SENSe1:CORRection:COLLect:ECal:UTHRU 1 :SENSe1:CORRection:COLLect:ECal:UTHRU? Return:1

3.3.4.10 ECal Confidence Check

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:CCHeck[:ACQuire]
Instruction	Reads the 'confidence data' associated with the specified ECal module and puts it into memory.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Cal > ECal > Confidence Check…
Example	:SENSe1:CORRection:COLLect:ECal:CCHeck

3.3.4.11 ECal Orientation

Command Format	:SENSe<cnum>:CORRection:COLLect:ECal:IORIentation[:STATe] <bool>

	:SENSe<cnum>:CORRection:COLLect:ECal:IORIentation[:STATe]?
Instruction	Specifies whether or not the VNA should perform orientation of the ECal module during calibration. Orientation is a technique by which the VNA automatically determines which ports of the module are connected to which ports of the VNA. Orientation begins to fail at very low power levels or if there is much attenuation in the path between the VNA and the ECal module.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	1
Menu	Cal > ECal > Orientation
Example	:SENSe1:CORRection:COLLect:ECal:ORIentation 1 :SENSe1:CORRection:COLLect:ECal:ORIentation? Return:1

3.3.4.12 ECal Characterization Information

Command Format	:SENSe:CORRection:COLLect:ECal:INFormation?
Instruction	Reads the identification and characterization information from the specified ECal module.
Parameter Type	None
Return	None
Default	None
Menu	Cal > ECal > Characterization…
Example	:SENSe:CORRection:COLLect:ECal:INFormation?

3.4 Display Commands

3.4.1 Trace Setup

3.4.1.1 Command List

Get all Trace list	:DISPlay:TRACe:LIST?
Set Active trace	:DISPlay:TRACe<tnum>:ACTivate
Set or get active trace	:DISPlay:WINDow<wnum>:TRACe<tnum>:SELect
The title of the trace	:DISPlay:TRACe<tnum>:TITLe:DATA
Enable the trace title	:DISPlay:TRACe<tnum>:TITLe[:STATe]
Add New Trace	:DISPlay:ADD:FUNCtion:EXECute TRC
Add New Trace +Channel	:DISPlay:ADD:FUNCtion:EXECute CH_TRC
Add New Trace +Window	:DISPlay:ADD:FUNCtion:EXECute WIN_TRC
Add New Trace+Channel+Window	:DISPlay:ADD:FUNCtion:EXECute WIN_CH_TRC
Trace Display State	:DISPlay:WINDow<wnum>:TRACe<tnum>
Move Trace to Window	:DISPlay:MEASure<tnum>:MOVE
Trace Hold Type	:CALCulate<cnum>:TRACe<tnum>:HOLD[:TYPE]
Reset Trace	:CALCulate<cnum>:TRACe<tnum>:HOLD:CLEar
Active Trace Maximization	:DISPlay:WINDow<wnum>:MAXimize

3.4.1.2 Get all Trace list

Command Format	:DISPlay:TRACe:LIST?
Instruction	Get the list of all channel.
Parameter Type	None
Return	Integer
Default	1
Menu	Display > Trace Setup > Select
Example	:DISPlay:TRACe:LIST? Return:1,2,3,4,5

3.4.1.3 Set Active trace

Command Format	:DISPlay:TRACe<tnum>:ACTivate
Instruction	This command specifies selected trace as the active trace.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	1
Menu	Display > Trace Setup > Select
Example	:DISPlay:TRACe2:ACTivate

3.4.1.4 Set or get active trace

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:SELect :DISPlay:WINDow:TRACe:SELect? :DISPlay:TRACe<tnum>:SELect :DISPlay:TRACe:SELect?
Instruction	This command sets/gets the active trace number.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Integer
Default	1
Menu	Display > Trace Setup > Select
Example	:DISPlay:WINDow2:TRACe3:SELect :DISPlay:WINDow2:TRACe3:SELect? Return: 2 :DISPlay:TRACe2:SELect

	:DISPlay:TRACe:SELect? Return:2

3.4.1.5 The title of the trace

Command Format	:DISPlay:TRACe<tnum>:TITLe:DATA <string> :DISPlay:TRACe<tnum>:TITLe:DATA?
Instruction	Sets or gets the title for the specified trace
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>: represents the title for the specified trace , and the parameter range: 255 characters or less.
Return	String
Default	1
Menu	Display > Trace Setup > Trace Title
Example	:DISPlay:TRACe 1:TITLe:DATA siglent :DISPlay:TRACe1:TITLe:DATA? Return :"siglent"

3.4.1.6 Enable the trace title

Command Format	:DISPlay:TRACe<tnum>:TITLe[:STATe] <bool> :DISPlay:TRACe<tnum>:TITLe[:STATe]?
Instruction	Turns ON or OFF the trace title.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Display > Trace Setup > Trace Title > Enabled

Example	:DISPlay:TRACe1:TITLe:STATe 1 :DISPlay:TRACe1:TITLe:STATe? Return :1

3.4.1.7 Add New Trace

Command Format	:DISPlay:ADD:FUNCtion:EXECute TRC
Instruction	Adds a new trace to the current working window and channel.
Parameter Type	None
Return	None
Default	None
Menu	Display > Trace Setup > Add Trace > New Trace
Example	:DISPlay:ADD:FUNCtion:EXECute TRC

3.4.1.8 Add New Trace +Channel

Command Format	:DISPlay:ADD:FUNCtion:EXECute CH_TRC
Instruction	Add a new channel and trace in the current working window.
Parameter Type	None
Return	None
Default	None
Menu	Display > Trace Setup > Add Trace > New Trace +Channel
Example	:DISPlay:ADD:FUNCtion:EXECute CH_TRC

3.4.1.9 Add New Trace +Window

Command Format	:DISPlay:ADD:FUNCtion:EXECute WIN_TRC
Instruction	Add a new window and trace in the current working channel.

Parameter Type	None
Return	None
Default	None
Menu	Display > Trace Setup > Add Trace > New Trace +Window
Example	:DISPlay:ADD:FUNCtion:EXECute WIN_TRC

3.4.1.10 Add New Trace+Channel+Window

Command Format	:DISPlay:ADD:FUNCtion:EXECute WIN_CH_TRC
Instruction	Add a new trace and new channel in a new window.
Parameter Type	None
Return	None
Default	None
Menu	Display > Trace Setup > Add Trace > New Trace+Channel+Window
Example	:DISPlay:ADD:FUNCtion:EXECute WIN_CH_TRC

3.4.1.11 Trace Display State

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum> <bool> :DISPlay:WINDow<wnum>:TRACe<tnum>?
Instruction	This command turns ON/OFF the trace display, for the selected trace of selected channel.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	None

Menu	Display > Trace Setup > Add Trace / Delete Trace
Example	:DISPlay:WINDow1:TRACe5 1 :DISPlay:WINDow1:TRACe5? Return: 1

3.4.1.12 Move Trace to Window

Command Format	DISPlay:MEASure<tnum>:MOVE <numeric>
Instruction	Moves a trace associated with measurement number to the specified window.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the number to the specified window, and the parameter range: 1~200.
Return	None
Default	None
Menu	Display > Trace Setup > Move Trace
Example	:DISPlay:ADD:FUNCtion:EXECute TRC :DISPlay:ADD:FUNCtion:EXECute WIN_TRC DISPlay:MEASure2:MOVE 2

3.4.1.13 Trace Hold Type

Command Format	:CALCulate<cnum>:TRACe<tnum>:HOLD[:TYPE] <type> :CALCulate<cnum>:TRACe<tnum>:HOLD[:TYPE]?
Instruction	This command sets/gets maximum/minimum trace hold function to hold the active trace at the maximum or minimum point.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not

	specified, <tnum> defaults to 1. <type>:={OFF|MAXimum|MINimum}
Return	Enumeration
Default	OFF
Menu	Display > Trace Setup > Trace Hold
Example	:CALCulate1:TRACe1:HOLD MAXimum :CALCulate1:TRACe1:HOLD? Return: MAX

3.4.1.14 Reset Trace

Command Format	:CALCulate<cnum>:TRACe<tnum>:HOLD:CLEar
Instruction	This command clears/resets the trace hold function that holds the active trace at either the maximum or minimum point.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	Display > Trace Setup > Trace Hold > Restart
Example	:CALCulate1:TRACe1:HOLD:CLEar

3.4.1.15 Active Trace Maximization

Command Format	:DISPlay:WINDow<wnum>:MAXimize <bool> :DISPlay:WINDow<wnum>:MAXimize?
Instruction	This command turns ON/OFF the maximization of the active trace of selected channel.

Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	None
Menu	Display > Trace Setup > Trace Maximize
Example	:DISPlay:WINDow1:MAXimize 1 :DISPlay:WINDow1:MAXimize? Return: 1

3.4.2 Channel Setup

3.4.2.1 Command List

Get all channel list	:DISPlay:CHANnel:LIST?
Set Active channel	:DISPlay:CHANnel<cnum>ACTivate
Set or get active channel	:DISPlay:CHANnel<cnum>SELect
The trace list of a channel	:DISPlay:CHANnel<cnum>TRACe:LIST?
The title of the channel	:DISPlay:CHANnel<cnum>TITLe:DATA
Enable the channel title	:DISPlay:CHANnel<cnum>TITLe[:STATe]

3.4.2.2 Get all channel list

Command Format	:DISPlay:CHANnel:LIST?
Instruction	Get the list of all channel.
Parameter Type	None
Return	Integer
Default	1
Menu	Display > Channel Setup > Select

Example	:DISPlay:CHANnel:LIST? Return:1,2,3,4

3.4.2.3 Set Active channel

Command Format	:DISPlay:CHANnel<cnum>ACTivate
Instruction	This command specifies selected channel as the active channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	1
Menu	Display > Channel Setup > Select
Example	:DISPlay:ADD:FUNCtion:EXECute CH_TRC :DISPlay:CHANnel1:ACTivate

3.4.2.4 Set or get active channel

Command Format	:DISPlay:CHANnel<cnum>SELect :DISPlay:CHANnel:SELect?
Instruction	This command sets/gets the active channel number.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer
Default	1
Menu	Display > Channel Setup > Select
Example	:DISPlay:CHANnel2:SELect :DISPlay:CHANnel:SELect? Return: 2

3.4.2.5 The trace list of a channel

Command Format	:DISPlay:CHANnel<cnum>TRACe:LIST?
Instruction	Get the trace list of a specified channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer
Default	1
Menu	Display > Channel Setup > Select
Example	There are Tr1 ,Tr2 and Tr4 in channel1, query the trace list in chhanel1: :DISPlay:CHANnel1:TRACe:LIST? Return:1,2,4

3.4.2.6 The title of the channel

Command Format	:DISPlay:CHANnel<cnum>TITLe:DATA <string> :DISPlay:CHANnel<cnum>TITLe:DATA?
Instruction	Sets or gets the title for the specified channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <string>: represents the title for the specified channel, and the parameter range: 255 characters or less.
Return	String
Default	1
Menu	Display > Channel Setup > Channel Title
Example	:DISPlay:CHANnel1:TITLe:DATA siglent :DISPlay:CHANnel1:TITLe:DATA? Return :"siglent"

3.4.2.7 Enable the channel title

Command Format	:DISPlay: CHANnel<cnum>TITLe[:STATe] <bool> :DISPlay:CHANnel<cnum>TITLe[:STATe]?
Instruction	Turns ON or OFF the channel title.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Display > Channel Setup > Channel Title > Enabled
Example	:DISPlay:CHANnel1:TITLe:STATe 1 :DISPlay:CHANnel1:TITLe:STATe? Return :1

3.4.3 Window Setup

3.4.3.1 Command List

Get all window list	:DISPlay:WINDow:LIST?
Window State	:DISPlay:WINDow<wnum>:STATe
Set Active window	:DISPlay:WINDow<wnum>:ACTivate
Set or get active window	:DISPlay:WINDow<wnum>:SELect
The trace list of a window	:DISPlay:WINDow<wnum>:TRACe:LIST?
The channel list of a window	:DISPlay:WINDow<wnum>:CHANnel:LIST?
The title of the window	:DISPlay:WINDow<wnum>:TITLe:DATA
Enable the window title	:DISPlay:WINDow<wnum>:TITLe[:STATe]
Set Window Layout	:DISPlay:ARRange
Active Window Maximization	:DISPlay:MAXimize
Clear Error Message	:DISPlay:CCLear

3.4.3.2 Get all window list

Command Format	:DISPlay:WINDow:LIST?
Instruction	Get the list of all Windows.
Parameter Type	None
Return	Integer
Default	1
Menu	Display > Window Setup > Select
Example	:DISPlay:WINDow:LIST? Return:1,2,3

3.4.3.3 Window State

Command Format	:DISPlay:WINDow<wnum>:STATe <bool> :DISPlay:WINDow<wnum>:STATe?
Instruction	This command sets/gets the display state of selected window.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	None
Menu	None
Example	:DISPlay:WINDow2:STATe 1 :DISPlay:WINDow2:STATe? Return: 1

3.4.3.4 Set Active window

Command Format	:DISPlay:WINDow<wnum>:ACTivate

Instruction	This command specifies selected window as the active window.(Write only).
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1.
Return	None
Default	1
Menu	Display > Window Setup > Select
Example	:DISPlay:WINDow2:ACTivate

3.4.3.5 Set or get active window

Command Format	:DISPlay:WINDow<wnum>:SELect :DISPlay:WINDow:SELect?
Instruction	This command sets/gets the active window number.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1.
Return	Integer
Default	1
Menu	Display > Window Setup > Select
Example	:DISPlay:WINDow2:SELect :DISPlay:WINDow:SELect? Return: 2

3.4.3.6 The trace list of a window

Command Format	:DISPlay:WINDow<wnum>:TRACe:LIST?
Instruction	Get the trace list of a specified window.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1.

Return	Integer
Default	1
Menu	Display > Trace Setup > Select
Example	There are Tr1 ,Tr2 and Tr4 in window1, query the trace list in window1: :DISPlay:WINDow1:TRACe:LIST? Return:1,2,4

3.4.3.7 The channel list of a window

Command Format	:DISPlay:WINDow<wnum>:CHANnel:LIST?
Instruction	Get the channel list of a specified window.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1.
Return	Integer
Default	1
Menu	Display > Channel Setup > Select
Example	There are CH1 and CH3 in window1, query the channel list in window 1: :DISPlay:WINDow1:CHANnel:LIST? Return:1,3

3.4.3.8 The title of the window

Command Format	:DISPlay:WINDow<wnum>:TITLe:DATA <string> :DISPlay:WINDow<wnum>:TITLe:DATA?
Instruction	Sets or gets the title for the specified window
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <string>: represents the title for the specified window, and the

	parameter range: 255 characters or less.
Return	String
Default	1
Menu	Display > Window Setup > Window Title
Example	:DISPlay:WINDow1:TITLe:DATA siglent :DISPlay:WINDow1:TITLe:DATA? Return : "siglent"

3.4.3.9 Enable the window title

Command Format	:DISPlay:WINDow<wnum>:TITLe[:STATe] <bool> :DISPlay:WINDow<wnum>:TITLe[:STATe]?
Instruction	Turns ON or OFF the window title.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Display > Window Setup > Window Title > Enabled
Example	:DISPlay:WINDow1:TITLe:STATe 1 :DISPlay:WINDow1:TITLe:STATe? Return :1

3.4.3.10 Set Window Layout

Command Format	:DISPlay:ARRange <type>
Instruction	Sets the layout of the windows on the LCD display.
Parameter Type	<type>:={TILE|OVERlay|STACk|SPLIt|QUAD|MEASure|CHANnel}
Return	Enumeration

Default	OVERlat
Menu	Display > Window Setup > Window Layout
Example	:DISPlay:ARRange TILE

3.4.3.11 Active Window Maximization

Command Format	:DISPlay:MAXimize <bool> :DISPlay:MAXimize?
Instruction	This command turns ON/OFF the window maximization of the active channel. If the maximization is set to ON, only the window of the active channel is maximized on the LCD display and the windows of the other channels are not displayed.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	1
Menu	Display > Window Setup > Window Max
Example	:DISPlay:MAXimize ON :DISPlay:MAXimize? Return: 1

3.4.3.12 Clear Error Message

Command Format	:DISPlay:CCLear
Instruction	This command clears the error message displayed in the status bar (at the bottom of the LCD display).
Parameter Type	None
Return	None
Default	None
Menu	None

Example	:DISPlay:CCLear

3.4.4 RefLine Setup

3.4.4.1 Command List

Activation HLine	:DISPlay:WINDow<wnum>:HLINe<lnum>:ACTivate
Delete HLine	:DISPlay:WINDow<wnum>:HLINe<lnum>:DELete
HLine State	:DISPlay:WINDow<wnum>:HLINe<lnum>[:STATe]
Set HLine name	:DISPlay:WINDow<wnum>:HLINe<lnum>:NAME
HLine value type	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:TYPE
HLine value absolute	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:ABSolute
HLine value relative	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:RELative
Set HLine colour	:DISPlay:WINDow<wnum>:HLINe<lnum>:COLor
Activation VLine	:DISPlay:WINDow<wnum>:VLINe<lnum>:ACTivate
Delete VLine	:DISPlay:WINDow<wnum>:VLINe<lnum>:DELete
VLine State	:DISPlay:WINDow<wnum>:VLINe<lnum>[:STATe]
Set VLine name	:DISPlay:WINDow<wnum>:VLINe<lnum>:NAME
VLine value type	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:TYPE
VLine value absolute	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:ABSolute
VLine value relative	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:RELative
Set VLine colour	:DISPlay:WINDow<wnum>:VLINe<lnum>:COLor
Set Refline all off	:DISPlay:WINDow<wnum>:REFLine:AOFF
Refline table type	:DISPlay:WINDow<wnum>:REFLine:TABLe:TYPE

3.4.4.2 Activation HLine

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:ACTivate
Instruction	Activate the Horizontal line. It will be displayed automatically after activation.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If

	not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1.
Return	None
Default	None
Menu	Display > RefLine Setup > HLine Select
Example	:DISP:WIND1:HLIN1:ACT

3.4.4.3 Delete HLine

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:DELete
Instruction	Delete the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1.
Return	None
Default	None
Menu	Display > RefLine Setup > Line Table > HLine >State>Delete
Example	:DISP:WIND1:HLIN1:DEL

3.4.4.4 HLine State

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>[:STATe] <bool> :DISPlay:WINDow<wnum>:HLINe<lnum>[:STATe]?
Instruction	Set or get the state of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1.

	<bool>:= ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	1
Menu	Display > RefLine Setup > Line Table > HLine >State
Example	:DISP:WIND1:HLIN1 1 :DISP:WIND1:HLIN1? Return: 1

3.4.4.5 Set HLine name

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:NAME <string> :DISPlay:WINDow<wnum>:HLINe<lnum>:NAME?
Instruction	Set or get the name of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1. <string>: Horizontal line name
Return	string
Default	HL*("*" stands for horizontal line number)
Menu	Display > RefLine Setup > Line Table > HLine >name
Example	:DISP:WIND1:HLIN1:NAME hLine1 :DISP:WIND1:HLIN1:NAME? Return: "hLine1"

3.4.4.6 HLine value type

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:TYPE <type> :DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:TYPE?

Instruction	Set or get the vlaule type of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1. <type>:={ABS|REL}
Return	Enumeration
Default	ABS
Menu	Display > RefLine Setup > Line Table >Hline >Value Type
Example	:DISP:WIND1:HLIN1:VAL:TYPE ABS :DISP:WIND1:HLIN1:VAL:TYPE? Return: ABS

3.4.4.7 HLine value absolute

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:ABSolute <numeric> :DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:ABSolute?
Instruction	Set or get the absolute value of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1. <numeric>: the absolute value of the Horizontal line.
Return	Float
Default	Measurement of the median vertical range
Menu	Display > RefLine Setup > Line Table > HLine >Abs Value
Example	:DISP:WIND1:HLIN1:VAL:ABS -10 :DISP:WIND1:HLIN1:VAL:ABS? Return: -10

3.4.4.8 HLine value relative

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:RELative <numeric> :DISPlay:WINDow<wnum>:HLINe<lnum>:VALue:RELative?
Instruction	Set or get the relative value of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1. <numeric>: the relative value of the Horizontal line,and range is 0 to 100.
Return	Float
Default	50
Menu	Display > RefLine Setup > Line Table > HLine > Rel Value
Example	:DISP:WIND1:HLIN1:VAL:REL 60 :DISP:WIND1:HLIN1:VAL:REL? Return: 60

3.4.4.9 Set HLine colour

Command Format	:DISPlay:WINDow<wnum>:HLINe<lnum>:COLor <string> :DISPlay:WINDow<wnum>:HLINe<lnum>:COLor?
Instruction	Set or get the color of the Horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Horizontal line number. If not specified, <lnum> defaults to 1. <string>: A color represented as an RGBA string, ranging from 00000000 to ffffffff
Return	RGBA string
Default	None

Menu	Display > RefLine Setup > Line Table > HLine > Color
Example	:DISP:WIND1:HLIN1:COL fffff500 :DISP:WIND1:HLIN1:COL? Return: "fffff500"

3.4.4.10 Activation VLine

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:ACTivate
Instruction	Activate the Vertical line. It will be displayed automatically after activation.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1.
Return	None
Default	None
Menu	Display > RefLine Setup > VLine Select
Example	:DISP:WIND1:VLIN1:ACT

3.4.4.11 Delete VLine

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:DELete
Instruction	Delete the Vertical line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1.
Return	None
Default	None

Menu	Display > RefLine Setup > Line Table >VLine >State>Delete
Example	:DISP:WIND1:VLIN1:DEL

3.4.4.12 VLine State

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>[:STATe] <bool> :DISPlay:WINDow<wnum>:VLINe<lnum>[:STATe]?
Instruction	Set or get the state of the Vertical line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	1
Menu	Display > RefLine Setup > Line Table >VLine >State
Example	:DISP:WIND1:VLIN1 1 :DISP:WIND1:VLIN1? Return: 1

3.4.4.13 Set VLine name

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:NAME <string> :DISPlay:WINDow<wnum>:VLINe<lnum>:NAME?
Instruction	Set or get the name of the horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1. <string>: Vertical line name

Return	string
Default	HL*("*" stands for Vertical line number)
Menu	Display > RefLine Setup > Line Table >VLline >name
Example	:DISP:WIND1:VLIN1:NAME hLine1 :DISP:WIND1:VLIN1:NAME? Return: "vLine1"

3.4.4.14 VLine value type

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:TYPE <type> :DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:TYPE?
Instruction	Set or get the vlaule type of the horizontal line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1. <type>:={ABS|REL}
Return	Enumeration
Default	ABS
Menu	Display > RefLine Setup > Line Table >VLine >Value Type
Example	:DISP:WIND1:VLIN1:VAL:TYPE ABS :DISP:WIND1:VLIN1:VAL:TYPE? Return: ABS

3.4.4.15 VLine value absolute

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:ABSolute <numeric> :DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:ABSolute?
Instruction	Set or get the absolute value of the Vertical line.

Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertical line number. If not specified, <lnum> defaults to 1. <numeric>: the absolute value of the Vertical line.
Return	Float
Default	Measurement of the median horizontal range
Menu	Display > RefLine Setup > Line Table >VLine >Abs Value
Example	:DISP:WIND1:VLIN1:VAL:ABS -10 :DISP:WIND1:VLIN1:VAL:ABS? Return: -10

3.4.4.16 VLine value relative

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:RELative <numeric> :DISPlay:WINDow<wnum>:VLINe<lnum>:VALue:RELative?
Instruction	Set or get the relative value of the Vertica line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertica line number. If not specified, <lnum> defaults to 1. <numeric>: the relative value of the Vertical line,and range is 0 to 100.
Return	Float
Default	50
Menu	Display > RefLine Setup > Line Table >VLine > Rel Value
Example	:DISP:WIND1:VLIN1:VAL:REL 60 :DISP:WIND1:VLIN1:VAL:REL? Return: 60

3.4.4.17 Set VLine colour

Command Format	:DISPlay:WINDow<wnum>:VLINe<lnum>:COLor <string> :DISPlay:WINDow<wnum>:VLINe<lnum>:COLor?
Instruction	Set or get the color of the Vertica line.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <lnum>:={[1]-8}, represents the Vertica line number. If not specified, <lnum> defaults to 1. <string>: A color represented as an RGBA string, ranging from 00000000 to ffffffff
Return	RGBA string
Default	None
Menu	Display > RefLine Setup > Line Table >VLine > Color
Example	:DISP:WIND1:VLIN1:COL fffff500 :DISP:WIND1:VLIN1:COL? Return: "fffff500"

3.4.4.18 Set Refline all off

Command Format	:DISPlay:WINDow<wnum>:REFLine:AOFF
Instruction	Hide all reference lines.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1.
Return	None
Default	None
Menu	Display > RefLine Setup > All Off
Example	:DISP:WIND1:REFL:AOFF

3.4.4.19 Refline table type

Command Format	:DISPlay:WINDow<wnum>:REFLine:TABLe:TYPE <type> :DISPlay:WINDow<wnum>:REFLine:TABLe:TYPE?
Instruction	Set or get the type of Line Table
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <wnum> defaults to 1. <type>:={OFF|HLine|VLine}
Return	Enumeration
Default	OFF
Menu	Display > RefLine Setup > Line Table
Example	:DISP:WIND1:REFL:TABL:TYPE HLine :DISP:WIND1:REFL:TABL:TYPE? Return: HLine

3.5 Format Commands

3.5.1 Format

3.5.1.1 Command List

Data transfer format	:FORMat:DATA
Trace Format	:CALCulate<cnum>:TRACe<tnum>:FORMat

3.5.1.2 Data transfer format

Command Format	:FORMat:DATA <type> :FORMat:DATA?
Instruction	Set/get the transfer format of data
Parameter Type	<type> ={ASCii|REAL|REAL32}

	ASCii: Specifies the ASCII transfer format. REAL: Specifies the IEEE 64-bit floating point binary transfer format. REAL32: Specifies the IEEE 32-bit floating point binary transfer format.
Return	Enumeration
Default	ASCii
Menu	None
Example	:FORMat:DATA REAL :FORMat:DATA? Return: REAL

3.5.1.3 Trace Format

Command Format	:CALCulate<cnum>[:SELected]:FORMat <type> :CALCulate<cnum>[:SELected]:FORMat? :CALCulate<cnum>:TRACe<tnum>:FORMat <type> :CALCulate<cnum>:TRACe<tnum>:FORMat?
Instruction	This command sets/gets the data format of the active trace of selected channel. This command sets/gets the data format of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>=:{MLOGarithmic|PHASe|GDELay| SLINear|SLOGarithmic|SCOMplex|SMITh|SADMittance|PLINear|PLOGarithmic|POLar|MLINear|SWR|REAL| IMAGinary|UPHase|PPHase}
Return	Enumeration
Default	MLOGarithmic
Menu	Format > Format1 or Format2
Example	:CALCulate1:FORMat PHASe

	:CALCulate1:FORMat? Return: PHAS :CALCulate1:TRACe1:FORMat GDELay :CALCulate1:TRACe1:FORMat? Return: GDEL

3.5.2 Trace data

3.5.2.1 Command List

Formatted Data Array	:CALCulate<cnum>:TRACe<tnum>:DATA:FDATa
Corrected Data Array	:CALCulate<cnum>:TRACe<tnum>:DATA:SDATa
Frequency of All Measurement Points	:SENSe<cnum>:FREQuency:DATA?
X Axis Data	:CALCulate<cnum>:TRACe<tnum>:DATA:XAXis?
Gets the formatted data of multiple traces	:CALCulate<cnum>:DATA:MFData <numeric>?
Gets the correction data of multiple traces	:CALCulate<cnum>:DATA:MSData <numeric>?
Get the SNP data	:CALCulate<cnum>:DATA:SNP?
Get Corrected Data Array	:SENSe<cnum>:DATA:CORRdata? S<XY>
Get Raw Data Array	:SENSe<cnum>:DATA:RAWData? S<XY>

3.5.2.2 Formatted Data Array

Command Format	:CALCulate<cnum>[:SELected]:DATA:FDATa <numeric1>,… ,<numeric NOP*2> :CALCulate<cnum>[:SELected]:DATA:FDATa? :CALCulate<cnum>:TRACe<tnum>:DATA:FDATa <numeric1>,… ,<numeric NOP*2> :CALCulate<cnum>:TRACe<tnum>:DATA:FDATa?
Instruction	This command sets/gets the formatted data array, for the active trace of selected channel.

	This command sets/gets the formatted data array of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric1>,… ,<numeric NOP*2>:Indicates the array data (formatted data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2) :Data (primary value) at the n-th measurement point. Data(n×2-1) :Data (secondary value) at the n-th measurement point. Always 0 when the data format is not the Smith chart format or the polar format. The index of the array starts from 0.
Return	Array
Default	None
Menu	None
Example	:CALCulate1:DATA:FDATa a1,b1,……,an,bn :CALCulate1:DATA:FDATa? :CALCulate1:TRACe1:DATA:FDATa a1,b1,……,an,bn :CALCulate1:TRACe1:DATA:FDATa?

3.5.2.3 Corrected Data Array

Command Format	:CALCulate<cnum>[:SELected]:DATA:SDATa <numeric1>,… ,<numeric NOP*2> :CALCulate<cnum>[:SELected]:DATA:SDATa? :CALCulate<cnum>:TRACe<tnum>:DATA:SDATa <numeric1>,… ,<numeric NOP*2> :CALCulate<cnum>:TRACe<tnum>:DATA:SDATa?
Instruction	This command sets/gets the corrected data array, for the active trace of selected channel. This command sets/gets the corrected data array of selected trace for

	the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric1>,... ,<numeric NOP*2>:Indicates the array data (correcte DATA:XAXis? d data array) of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2) :Real part of the data (complex number) at the n-th measurement point. Data(n×2-1) :Imaginary part of the data (complex number) at the n-th measurement point. The index of the array starts from 0.
Return	Array
Default	None
Menu	None
Example	:CALCulate1:DATA:SDATa a1,b1,.....,an,bn :CALCulate1:DATA:SDATa? :CALCulate1:TRACe1:DATA:SDATa a1,b1,.....,an,bn :CALCulate1:TRACe1:DATA:SDATa?

3.5.2.4 Frequency of All Measurement Points

Command Format	:SENSe<cnum>:FREQuency:DATA?
Instruction	This command reads the frequencies at all measurement points of channels 1 to 200.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Data array
Default	None
Menu	None

Example	:SENSe1:FREQuency:DATA?

3.5.2.5 X Axis Data

Command Format	:CALCulate<cnum>[:SELected]:DATA:XAXis? :CALCulate<cnum>:TRACe<tnum>:DATA:XAXis?
Instruction	This command reads the data of measurement points of X axis, for the active trace of selected channel. This command reads the data of measurement points of X axis of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Data array(Unit depend on sweep type)
Default	None
Menu	None
Example	:CALCulate1:DATA:XAXis? :CALCulate1:TRACe1:DATA:XAXis?

3.5.2.6 Gets the formatted data of multiple traces

Command Format	:CALCulate<cnum>:DATA:MFData <numeric>?
Instruction	gets the formatted data array of multiple traces (traces-n, m, ... to l) of the selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the trace number. "n, m, l, ..." where n, m, l are 1 to the maximum trace number. Use comma for separator of trace number.

Return	Array
Default	None
Menu	None
Example	:CALC:DATA:MFData? "1,2,3" Return: 8.457302793195e-02,0.000000000000e+00, -1.426901425958e-01,0.000000000000e+00, -2.635991012650e-01,0.000000000000e+00, -2.839929320553e-01,0.000000000000e+00, -3.315815592045e-01,0.000000000000e+00, -3.528884698654e-01,0.000000000000e+00, -3.937646932011e-01,0.000000000000e+00, -4.517490965595e-01…

3.5.2.7 Gets the correction data of multiple traces

Command Format	:CALCulate<cnum>:DATA:MSData <numeric>?
Instruction	gets the correction data array of multiple traces (traces-n, m, ... to l) of the selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the trace number. "n, m, l, ..." where n, m, l are 1 to the maximum trace number. Use comma for separator of trace number.
Return	Array
Default	None
Menu	None
Example	:CALC:DATA:MSData? "1,2,3" Return: 1.010376816410e+00,-8.191833528689e-03, -6.960549382249e-01,-6.946841837980e-01, 6.925621007541e-03,9.700560127871e-01, 6.967893184358e-01,-6.718442699877e-01, -9.629746082335e-01, -1.534994428298e-02,

	6.515030755121e-01, 7.056409245766e-01, 4.932709557852e-02,-9.543263693213e-01, -7.007103025244e-01,...

3.5.2.8 Get the SNP data

Command Format	:CALCulate<cnum>:DATA:SNP? <numeric>
Instruction	This command returns SNP data without header information, and in columns, not in rows as .SnP files. This means that the data returned from this command sends all frequency data, then all Sx1 magnitude or real data, then all Sx1 phase or imaginary data, and so forth.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the number of SNP files "N", ranging from 1 to 4
Return	String(The actual returned data will be affected by the data transmission format set, including ASCII/REAL32/REAL64, and the default is ASCII code)
Default	None
Menu	None
Example	:CALC:DATA:SNP? 1 Return : 1.000000000000e+05,4.259950000000e+07,8.509900000000e+07, 1.275985000000e+08,1.700980000000e+08,2.125975000000e+08, 2.550970000000e+08,2.975965000000e+08,3.400960000000e+08, 3.825955000000e+08,

3.5.2.9 Get Corrected Data Array

Command Format	:SENSe<cnum>:DATA:CORRdata? S<XY>
Instruction	This command gets S-Parameter data of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.

	"S<XY>": Where X: 1 to 4 Y: 1 to 4
Return	Indicates the array data of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2): Real part of the data (complex number) at the n-th measurement point. Data(n×2-1): Imaginary part of the data (complex number) at the n-th measurement point. The index of the array starts from 0.
Default	None
Menu	None
Example	:SENSe1:DATA:CORRdata? S11

3.5.2.10 Get Raw Data Array

Command Format	:SENSe<cnum>:DATA:RAWData? S<XY>
Instruction	This command gets the raw data of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. " S<XY>": Where X: 1 to 4 Y: 1 to 4
Return	Indicates the array data of NOP (number of measurement points)×2. Where n is an integer between 1 and NOP. Data(n×2-2): Real part of the data (complex number) at the n-th measurement point. Data(n×2-1): Imaginary part of the data (complex number) at the n-th measurement point.

	The index of the array starts from 0.
Default	None
Menu	None
Example	:SENSe1:DATA:RAWData? S11

3.6 Frequency Commands

3.6.1 Frequency setup

3.6.1.1 Command List

Start Frequency	:SENSe<cnum>:FREQuency:STARt
Stop Frequency	:SENSe<cnum>:FREQuency:STOP
Center Frequency	:SENSe<cnum>:FREQuency:CENTer
Frequency Span	:SENSe<cnum>:FREQuency:SPAN
CW Frequency	:SENSe<cnum>:FREQuency:CW

3.6.1.2 Start Frequency

Command Format	:SENSe<cnum>:FREQuency:STARt <numeric> :SENSe<cnum>:FREQuency:STARt?
Instruction	This command sets/gets the start value of the sweep range of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float, unit: Hz
Default	9 kHz
Menu	Freq > Start

Example	:SENSe1:FREQuency:STARt 100e3 :SENSe1:FREQuency:STARt? Return: 100000

3.6.1.3 Stop Frequency

Command Format	:SENSe<cnum>:FREQuency:STOP <numeric> :SENSe<cnum>:FREQuency:STOP?
Instruction	This command sets/gets the stop value of the sweep range of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float, unit: Hz
Default	Maximum frequency of the analyzer
Menu	Freq > Stop
Example	:SENSe1:FREQuency:STOP 1e9 :SENSe1:FREQuency:STOP? Return: 1000000000

3.6.1.4 Center Frequency

Command Format	:SENSe<cnum>:FREQuency:CENTer <numeric> :SENSe<cnum>:FREQuency:CENTer?
Instruction	This command sets/gets the center value of the sweep range of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the center frequency.
Return	Float, unit: Hz

Default	The central value of the frequency range of the analyzer
Menu	Freq > Center
Example	:SENSe1:FREQuency:CENTer 1e9 :SENSe1:FREQuency:CENTer? Return: 1000000000

3.6.1.5 Frequency Span

Command Format	:SENSe<cnum>:FREQuency:SPAN <numeric> :SENSe<cnum>:FREQuency:SPAN?
Instruction	This command sets/gets the span value of the sweep range of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the frequency span.
Return	Float, unit: Hz
Default	8.4999 GHz
Menu	Freq > Span
Example	:SENSe1:FREQuency:SPAN 1e6 :SENSe1:FREQuency:SPAN? Return: 1000000

3.6.1.6 CW Frequency

Command Format	:SENSe<cnum>:FREQuency:CW <numeric> :SENSe<cnum>:FREQuency:CW? :SENSe<cnum>:FREQuency:FIXed <numeric> :SENSe<cnum>:FREQuency:FIXed?
Instruction	This command sets/gets the fixed frequency (CW frequency) for the

	power sweep for channels 1 to 200.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the fixed frequency (CW frequency).
Return	Float, unit: Hz
Default	1 GHz
Menu	Freq > CW
Example	:SENSe1:FREQuency:CW 2e9 :SENSe1:FREQuency:CW? Return: 2000000000 :SENSe1:FREQuency:FIXed 3e9 :SENSe1:FREQuency:FIXed? Return: 3000000000

3.6.2 Freq Offset

3.6.2.1 Command List

Channel FOM State	:SENSe<cnum>:FOM[:STATe]
FOM Range Number	:SENSe<cnum>:FOM:COUNt?
FOM Range Name List	:SENSe<cnum>:FOM:CATalog?
FOM Range Index	:SENSe<cnum>:FOM:RNUM?
FOM Range Name	:SENSe<cnum>:FOM:RANGe<rnum>:NAME?
FOM X-Axis Range Name	:SENSe<cnum>:FOM:DISPlay:SELect
FOM Range Sweep Type	:SENSe{chnum}:FOM:RANGe<rnum>:SWEep:TYPE
FOM Range Start Frequency	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STARt
FOM Range Stop	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STOP

Frequency	
FOM Range CW Frequency	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:CW
Add a Segment in FOM Range	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:ADD
Delete a Segment in FOM Range	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:DELete
Segment Number of FOM Range	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:COUNt?
Clear Segment Table of FOM Range	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:DELete:ALL
Segment Enable State	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>[:STATe]
Segment Start Frequency	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STARt
Segment Stop Frequency	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STOP
Segment Center Frequency	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:CENTer
Segment Frequency Span	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:SPAN
Segment Sweep Point	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:POINts
Individual Power Level State Control	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:POWer[:LEVel]:CONTrol
Individual Power Level	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:POWer[:LEVel]
Individual Sweep Time State Control	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:TIME:CONTrol
Individual Sweep Time	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:TIME
Individual Sweep Delay State Control	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:DELay:CONTrol
Individual Sweep Delay	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:DELay
Individual IFBW	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:BWIDth[:RESolution]:CONTrol

State Control	
Individual IFBW	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:BWIDth[:RESolution]
FOM Range Couple State	:SENSe<cnum>:FOM:RANGe<rnum>:COUPled
FOM Range Multiplier	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:MULTiplier
FOM Range Divisor	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:DIVisor
FOM Range Offset	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:OFFSet

3.6.2.2 Channel FOM State

Command Format	:SENSe<cnum>:FOM[:STATe] <bool> :SENSe<cnum>:FOM[:STATe]?
Instruction	This command sets/gets Frequency Offset Measurement Function enable state.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Freq Offset Enable
Example	:SENS:FOM ON :SENS:FOM? Return: 1

3.6.2.3 FOM Range Number

Command Format	:SENSe<cnum>:FOM:COUNt?
Instruction	This command gets the number of valid FOM ranges in the VNA.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

Return	Integer
Default	None
Menu	None
Example	:SENS:FOM:COUN? Return: 3

3.6.2.4 FOM Range Name List

Command Format	:SENSe<cnum>:FOM:CATalog?
Instruction	This command gets a comma-separated list of available range names in the VNA.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	String
Default	None
Menu	Freq > Freq Offset… > Annotation
Example	:SENS:FOM:CAT? Return: “Primary,Source,Receivers”

3.6.2.5 FOM Range Index

Command Format	:SENSe<cnum>:FOM:RNUM? <string>
Instruction	This command gets the range Index of specified FOM range name. The FOM range items are typically numbered as follows: 1.Primary 2.Source 3.Receivers
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<string>: represents the valid FOM range name.
Return	Integer
Default	None
Menu	None
Example	:SENS:FOM:RNUM? "Source" Return: 2

3.6.2.6 FOM Range Name

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:NAME?
Instruction	This command gets the range name of specified FOM range index.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1.
Return	String
Default	None
Menu	Freq > Freq Offset… > Annotation
Example	:SENS:FOM:RANG:NAME? Return: "Primary"

3.6.2.7 FOM X-Axis Range Name

Command Format	:SENSe<cnum>:FOM:DISPlay:SELect <string> :SENSe<cnum>:FOM:DISPlay:SELect?
Instruction	This command sets/gets the FOM range to be displayed on the SNA x-axis.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <string>: represents the valid FOM range name.

	Use"SENSe:FOM:CAT? to see a list of available frequency range names.
Return	String
Default	"Source"
Menu	Freq > Freq Offset… > Annotation
Example	:SENS:FOM:DISP:SEL "Source" :SENS:FOM:DISP:SEL? Return: "Source"

3.6.2.8 FOM Range Sweep Type

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SWEep:TYPE <type> :SENSe<cnum>:FOM:RANGe<rnum>:SWEep:TYPE?
Instruction	This command sets/gets the sweep type to be used with the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <type>:= {LINear|LOGarithmic|SEGMent|POWer|CW}
Return	Enumeration
Default	LINear
Menu	Freq > Freq Offset… > Sweep Type
Example	:SENS:FOM:RANG2:SWE:TYPE CW :SENS:FOM:RANG2:SWE:TYPE? Return: CW

3.6.2.9 FOM Range Start Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STARt <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STARt?

Instruction	This command sets/gets the start value of frequency range..
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Settings > Start Freq
Example	:SENS:FOM:RANG2:FREQ:STAR 1E9 :SENS:FOM:RANG2:FREQ:STAR? Return: 1000000000

3.6.2.10 FOM Range Stop Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STOP <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:STOP?
Instruction	This command sets/gets stop value of frequency range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Settings > Stop Freq
Example	:SENS:FOM:RANG2:FREQ:STOP 1E9 :SENS:FOM:RANG2:FREQ:STOP? Return: 1000000000

3.6.2.11 FOM Range CW Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:CW <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:CW?
Instruction	This command sets/gets CW Frequency of frequency range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the CW frequency.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > CW Freq
Example	:SENS:FOM:RANG2:FREQ:CW 1E9 :SENS:FOM:RANG2:FREQ:CW? Return: 1000000000

3.6.2.12 Add a Segment in FOM Range

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:ADD
Instruction	This command adds a segment into the segment table of frequency range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. Segment numbers must be sequential. If a new number is added where one currently exists, the existing segment and those following are incremented by one.
Return	None
Default	None

Menu	Freq > Freq Offset… > Sweep Type > Segment > Add Segment
Example	:SENS:FOM:RANG:SEGM:ADD

3.6.2.13 Delete a Segment in FOM Range

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:DELete
Instruction	This command deletes a segment in the segment table of frequency range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1.
Return	None
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Delete Segment
Example	:SENS:FOM:RANG:SEGM:DEL

3.6.2.14 Segment Number of FOM Range

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:COUNt?
Instruction	This command gets the number of segments that exist for the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1.
Return	Integer
Default	1

Menu	None
Example	:SENS:FOM:RANG:SEGM:COUN?

3.6.2.15 Clear Segment Table of FOM Range

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:DELete:ALL
Instruction	This command clears the segment table of frequency range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1.
Return	None
Default	None
Menu	Sweep > Segment Table > Delete All Segment
Example	:SENS:FOM:RANG:SEGM:DEL:ALL

3.6.2.16 Segment Enable State

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>[:STATe] <bool> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>[:STATe]?
Instruction	This command sets/gets enable state of the specified segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Sweep Type > Segment
Example	:SENS:FOM:RANG:SEGM OFF :SENS:FOM:RANG:SEGM? Return: 0

3.6.2.17 Segment Start Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STARt <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STARt?
Instruction	This command sets/gets the start frequency for the specified sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Segment Table > start
Example	:SENS:FOM:RANG:SEGM:FREQ:STAR 1E9 :SENS:FOM:RANG:SEGM:FREQ:STAR? Return: 1000000000

3.6.2.18 Segment Stop Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STOP <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:STOP?
Instruction	This command sets/gets the stop frequency for the specified sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Segment Table > stop
Example	:SENS:FOM:RANG:SEGM:FREQ:STOP 1E9 :SENS:FOM:RANG:SEGM:FREQ:STOP? Return: 1000000000

3.6.2.19 Segment Center Frequency

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:CENTer <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:CENTer?
Instruction	This command sets/gets the center frequency for the specified sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If

	not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the center frequency.
Return	Float
Default	None
Menu	None
Example	:SENS:FOM:RANG:SEGM:FREQ:CENT 1E9 :SENS:FOM:RANG:SEGM:FREQ:CENT? Return: 1000000000

3.6.2.20 Segment Frequency Span

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:SPAN <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:FREQuency:SPAN?
Instruction	This command sets/gets the frequency span for the specified sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the frequency span.
Return	Float
Default	None
Menu	None
Example	:SENS:FOM:RANG:SEGM:FREQ:SPAN 1E9 :SENS:FOM:RANG:SEGM:FREQ:SPAN?

	Return: 1000000000

3.6.2.21 Segment Sweep Point

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:POINts <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:POINts?
Instruction	This command sets/gets the number of data points for the specified sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the number of points in the segment. The total number of points in all segments cannot exceed 20001. A segment can have as few as 2 points.
Return	Integer
Default	None
Menu	Freq > Freq Offset... > Sweep Type > Segment > Segment Table > Points
Example	:SENS:FOM:RANG:SEGM:SWE:POIN 300 :SENS:FOM:RANG:SEGM:SWE:POIN? Return: 300

3.6.2.22 Individual Power Level State Control

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:POWer[:LEVel]:CONTrol <bool> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:POWer[:LEVel]:CONT

	rol?
Instruction	This command sets/gets the power level can be set independently for each sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Power Levels
Example	:SENS:FOM:RANG:SEGM:POW:CONT ON :SENS:FOM:RANG:SEGM:POW:CONT? Return: 1

3.6.2.23 Individual Power Level

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:POWer[:LEVel] <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:POWer[:LEVel]?
Instruction	This command sets/gets the power level for the specified segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the power level in dBm,the range is -55dBm to 20dBm.

Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Power Levels > Power Level
Example	:SENS:FOM:RANG:SEGM:POW -10 :SENS:FOM:RANG:SEGM:POW? Return: -10

3.6.2.24 Individual Sweep Time State Control

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:TIME:CONTrol <bool> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:TIME:CONTrol?
Instruction	This command sets/gets the sweep time can be set independently for each sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Sweep Time
Example	:SENS:FOM:RANG:SEGM:SWE:TIME:CONT ON :SENS:FOM:RANG:SEGM:SWE:TIME:CONT? Return: 1

3.6.2.25 Individual Sweep Time

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:TIME <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:TIME?
Instruction	This command sets/gets the time the VNA takes to sweep the specified segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the sweep time.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Sweep Time > Sweep Time
Example	:SENS:FOM:RANG:SEGM:SWE:TIME 5 :SENS:FOM:RANG:SEGM:SWE:TIME? Return: 5

3.6.2.26 Individual Sweep Delay State Control

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:DELay:CONTrol <bool> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:SWEep:DELay:CONTrol?
Instruction	This command sets/gets the sweep delay can be set independently for each sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If

	not specified, <rnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Sweep Delay
Example	:SENS:FOM:RANG:SEGM:SWE:DEL:CONT ON :SENS:FOM:RANG:SEGM:SWE:DEL:CONT? Return: 1

3.6.2.27 Individual Sweep Delay

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:DELay <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:SWEep:DELay?
Instruction	This command sets/gets the time the VNA waits before sweeping the specified segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:represents the sweep delay time.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent Sweep Delay > Delay
Example	:SENS:FOM:RANG:SEGM:SWE:DEL 5 :SENS:FOM:RANG:SEGM:SWE:DEL? Return: 5

3.6.2.28 Individual IFBW State Control

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:BWIDth[:RESolution]:CONTrol <bool> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent:BWIDth[:RESolution]:CONTrol?
Instruction	This command sets/gets the IF Bandwidth resolution can be set independently for each sweep segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent IF Bandwidth
Example	:SENS:FOM:RANG:SEGM:BWID:CONT ON :SENS:FOM:RANG:SEGM:BWID:CONT? Return: 1

3.6.2.29 Individual IFBW

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:BWIDth[:RESolution] <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:SEGMent<segnum>:BWIDth[:RESolution]?
Instruction	This command sets/gets IF Bandwidth for the specified segment in the specified range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1.

	<segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:={1|2|3|4|5|6|7|10|15|20|30|40|50|70|100|150|200|300|400|500|700|1E3|1.5E3|2E3|3E3|4E3|5E3|7E3|10E3|15E3|20E3|30E3|40E3|50E3|70E3|100E3|150E3|200E3|300E3|400E3|500E3|700E3|1E6|1.5E6|2E6|3E6|4E6|5E6|7E6|10E6} ,unit: Hz.
Return	Float
Default	None
Menu	Freq > Freq Offset… > Sweep Type > Segment > Sweep Properties > Independent IF Bandwidth > IF Bandwidth
Example	:SENS:FOM:RANG:SEGM:BWID 1E4 :SENS:FOM:RANG:SEGM:BWID? Return: 10000

3.6.2.30 FOM Range Couple State

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:COUPled <bool> :SENSe<cnum>:FOM:RANGe<rnum>:COUPled?
Instruction	This command gets the state of coupling of the specified range to the primary range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Freq > Freq Offset… > Mode > Coupled
Example	:SENS:FOM:RANG2:COUP OFF :SENS:FOM:RANG2:COUP? Return: 0

3.6.2.31 FOM Range Multiplier

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:MULTiplier <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:MULTiplier?
Instruction	This command sets/gets the multiplier value to be used when coupling this range to the primary range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the multiplier value, and the range is 1 to100.
Return	Integer
Default	1
Menu	Freq > Freq Offset… > Couped > Multiplier
Example	:SENS:FOM:RANG2:FREQ:MULT 2 :SENS:FOM:RANG2:FREQ:MULT? Return: 2

3.6.2.32 FOM Range Divisor

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:DIVisor <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:DIVisor?
Instruction	This command sets/gets the divisor value to be used when coupling this range to the primary range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the divisor value, and the range is 1 to100.

Return	Integer
Default	1
Menu	Freq > Freq Offset… > Couped > Divisor
Example	:SENS:FOM:RANG2:FREQ:DIV 2 :SENS:FOM:RANG2:FREQ:DIV? Return: 2

3.6.2.33 FOM Range Offset

Command Format	:SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:OFFSet <numeric> :SENSe<cnum>:FOM:RANGe<rnum>:FREQuency:OFFSet?
Instruction	This command sets/gets the offset value to be used when coupling this range to the primary range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <rnum>: represents the available frequency offset device number. If not specified, <rnum> defaults to 1. <numeric>:represents the offset value.
Return	Float
Default	0
Menu	Freq > Freq Offset… > Couped > Offset
Example	:SENS:FOM:RANG2:FREQ:OFFS 1E9 :SENS:FOM:RANG2:FREQ:OFFS? Return: 1000000000

3.7 Math Commands

3.7.1 Memory

3.7.1.1 Command List

Data to Memory	:CALCulate<cnum>:TRACe<tnum>:MATH:MEMorize
NORMalize	:CALCulate<cnum>:TRACe<tnum>:MATH:NORMalize
Math Method	:CALCulate<cnum>:TRACe<tnum>:MATH:FUNCtion
Data Trace Display State	:DISPlay:WINDow<wnum>:TRACe<tnum>:STATe
Memory Trace Display State	:DISPlay:WINDow<wnum>:TRACe<tnum>:MEMory[:STATe]

3.7.1.2 Data to Memory

Command Format	:CALCulate<cnum>[:SELected]:MATH:MEMorize :CALCulate<cnum>:TRACe<tnum>:MATH:MEMorize
Instruction	This command puts the active data trace into memory. You can store one memory trace for every displayed trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None
Menu	Math > Memory > Data → Memory
Example	:CALCulate1:MATH:MEMorize :CALCulate1:TRACe1:MATH:MEMorize

3.7.1.3 NORMalize

Command Format	:CALCulate<cnum>[:SELected]:MATH:NORMalize :CALCulate<cnum>:TRACe<tnum>:MATH:NORMalize
Instruction	This command performs the same function as Data->Memory, then Data / Memory.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

Return	None
Default	None
Menu	Math > Memory > Normalize
Example	:CALCulate1:MATH:NORMalize :CALCulate1:TRACe1:MATH:NORMalize

3.7.1.4 Math Method

Command Format	:CALCulate<cnum>[:SELected]:MATH:FUNCtion <type> :CALCulate<cnum>[:SELected]:MATH:FUNCtion? :CALCulate<cnum>:TRACe<tnum>:MATH:FUNCtion <type> :CALCulate<cnum>:TRACe<tnum>:MATH:FUNCtion?
Instruction	This command sets/gets the data trace display method (math method between measurement data and memory trace data), for the active trace of selected channel (Ch). This command sets/gets the data trace display method (math method between measurement data and memory trace data), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={NORMal|SUBTract|DIVide|ADD|MULTiply}
Return	Enumeration
Default	NORMal
Menu	Math > Memory > Math
Example	:CALCulate1:MATH:MEMorize :CALCulate1:MATH:FUNCtion SUBTract :CALCulate1:MATH:FUNCtion? Return: SUBT :CALCulate1:TRACe1:MATH:FUNCtion DIVide

	:CALCulate1:TRACe1:MATH:FUNCtion? Return: DIV

3.7.1.5 Data Trace Display State

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:STATe <bool> :DISPlay:WINDow<wnum>:TRACe<tnum>:STATe?
Instruction	This command turns ON/OFF the data trace display, for the selected trace of selected channel.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	None
Menu	Math > Memory > Display > Data (when the memory trace display is OFF) Math > Memory > Display > Data & Mem (when the memory trace display is ON)
Example	:DISPlay:WINDow1:TRACe5:STATe 0 :DISPlay:WINDow1:TRACe5:STATe? Return: 0

3.7.1.6 Memory Trace Display State

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:MEMory[:STATe] <bool> :DISPlay:WINDow<wnum>:TRACe<tnum>:MEMory[:STATe]?
Instruction	This command turns ON/OFF the memory trace display, for the selected trace of selected channel.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If

	not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	None
Menu	Math > Memory > Display > Mem (when the data trace display is OFF) Math > Memory > Display > Data & Mem (when the data trace display is ON)
Example	:DISPlay:WINDow1:TRACe5:MEMory ON :DISPlay:WINDow1:TRACe5:MEMory? Return: 1

3.7.2 Analysis

3.7.2.1 Command List

Parameter Conversion State	:CALCulate<cnum>:TRACe<tnum>:CONVersion[:STATe]
Parameter Conversion	:CALCulate<cnum>:TRACe<tnum>:CONVersion:FUNCtion
Equation Text	:CALCulate<cnum>:TRACe<tnum>:EQUation:TEXT
Equation Valid	:CALCulate<cnum>:TRACe<tnum>:EQUation:VALID?
Equation State	:CALCulate<cnum>:TRACe<tnum>:EQUation:STATE
Trace Statistics State	:CALCulate<cnum>:TRACe<tnum>:MSTatistics[:STATe]
Statistics Type	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:TYPE
Get Statistics Data	:CALCulate<cnum>:TRACe<tnum>:MSTatistics:DATA?
Statistics Range User Span State	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STATe
User Span Statistics Range Start Frequency	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STARt
User Span Statistics Range Stop Frequency	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STOP
Limit Test State	:CALCulate<cnum>:TRACe<tnum>:LIMit[:STATe]

Limit Line State	:CALCulate<cnum>:TRACe<tnum>:LIMit:DISPlay[:STATe]
Limit Sound State	:CALCulate<cnum>:MEASure<tnum>:LIMit:SOUNd[:STATe]
Display of limit test failure points	SYSTem:PREFerences:ITEM:RTOF
Globle Fail Sign	:DISPlay:FSIGn
Get Limit Test Result	:CALCulate<cnum>:TRACe<tnum>:LIMit:FAIL?
Limit Table	:CALCulate<cnum>:TRACe<tnum>:LIMit:DATA
Get Limit All Report	:CALCulate<cnum>:TRACe<tnum>:LIMit:REPort:ALL?
Get Limit Failed Points	:CALCulate<cnum>:TRACe<tnum>:LIMit:REPort:POINts?
Get Limit Failed Data	:CALCulate<cnum>:TRACe<tnum>:LIMit:REPort[:DATA]
Table Display Type	:DISPlay:WINDow<wnum>:TABLe
Load Limit Table	:MMEMory:LOAD:LIMit
Store Limit Table	:MMEMory:STORE:LIMit
Point Limit Test State	:CALCulate<cnum>:TRACe<tnum>:PLIMit[:STATe]
Point Limit Line State	:CALCulate<cnum>:TRACe<tnum>:PLIMit:DISPlay:LINE
Point Limit Test Sound State	:CALCulate<cnum>:MEASure<tnum>:PLIMit:SOUNd
Point Limit Test Result	:CALCulate<cnum>:TRACe<tnum>:PLIMit:FAIL?
Get Point Limit test report	:CALCulate<cnum>[:SELected]:PLIMit:REPort[:DATA]?
Point Limit Data	:CALCulate<cnum>[:SELected]:PLIMit:DATA
Load Point Limit Table	:MMEMory:LOAD:PLIMit
Store Point Limit Table	:MMEMory:STORE:PLIMit
Ripple Limit Test State	:CALCulate<cnum>:TRACe<tnum>:RLIMit[:STATe]
Ripple Limit Line State	:CALCulate<cnum>:TRACe<tnum>:RLIMit:DISPlay:LINE
Ripple Limit Test Sound State	:CALCulate<cnum>:MEASure<tnum>:RLIMit:SOUNd
Ripple Limit Test Result	:CALCulate<cnum>:TRACe<tnum>:RLIMit:FAIL?
Ripple Limit Data	:CALCulate<cnum>:TRACe<tnum>:RLIMit:DATA
Get Ripple Result	:CALCulate<cnum>:TRACe<tnum>:RLIMit:REPort[:DATA]?
Load Ripple Limit Table	:MMEMory:LOAD:RLIMit
Store Ripple Limit Table	:MMEMory:STORE:RLIMit
Bandwidth Test State	:CALCulate<cnum>:TRACe<tnum>:BLIMit[:STATe]
Bandwidth Test Value State	:CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:VALue

Bandwidth Test Marker State	:CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:MARKer
Bandwidth Test Threshold	:CALCulate<cnum>:TRACe<tnum>:BLIMit:DB
Bandwidth Test MiNimum	:CALCulate<cnum>:TRACe<tnum>:BLIMit:MINimum
Bandwidth Test Maximum	:CALCulate<cnum>:TRACe<tnum>:BLIMit:MAXimum
Get Bandwidth Test Fail Result	:CALCulate<cnum>:TRACe<tnum>:BLIMit:FAIL?
Bandwidth Test Report Data	:CALCulate<cnum>:TRACe<tnum>:BLIMit:REPort[:DATA]?

3.7.2.2 Parameter Conversion State

Command Format	:CALCulate<cnum>[:SELected]:CONVersion[:STATe] <bool> :CALCulate<cnum>[:SELected]:CONVersion[:STATe]? :CALCulate<cnum>:TRACe<tnum>:CONVersion[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:CONVersion[:STATe]?
Instruction	This command sets/gets the parameter conversion state for the active trace of selected channel. This command sets/gets the parameter conversion state for the selected trace and selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Conversion
Example	:CALCulate1:CONVersion:STATe 1 :CALCulate1:CONVersion:STATe? Return: 1 :CALCulate1:TRACe1:CONVersion:STATe 1 :CALCulate1:TRACe1:CONVersion:STATe?

	Return: 1

3.7.2.3 Parameter Conversion

Command Format	:CALCulate<cnum>[:SELected]:CONVersion:FUNCtion <type> :CALCulate<cnum>[:SELected]:CONVersion:FUNCtion? :CALCulate<cnum>:TRACe<tnum>:CONVersion:FUNCtion <type> :CALCulate<cnum>:TRACe<tnum>:CONVersion:FUNCtion?
Instruction	This command sets/gets the parameter after conversion using the parameter conversion function, for the active trace of selected channel. This command sets/gets the parameter after conversion using the parameter conversion function for the selected trace and selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={ZREFlection|ZTRansmit|YREFlection|YTRansmit|INVersion|ZTSHunt|YTSHunt|CONJugation}
Return	Enumeration
Default	ZREFlection
Menu	Math > Analysis > Conversion
Example	:CALCulate1:CONVersion:STATe 1 :CALCulate1:CONVersion:FUNCtion ZTSHunt :CALCulate1:CONVersion:FUNCtion? Return: ZTSH :CALCulate1:TRACe1:CONVersion:STATe 1 :CALCulate1:TRACe1:CONVersion:FUNCtion YREFlection :CALCulate1:TRACe1:CONVersion:FUNCtion? Return: YREF

3.7.2.4 Equation Text

Command Format	:CALCulate<cnum>[:SELected]:EQUation:TEXT <string> :CALCulate<cnum>[:SELected]:EQUation:TEXT? :CALCulate<cnum>:TRACe<tnum>:EQUation:TEXT <string> :CALCulate<cnum>:TRACe<tnum>:EQUation:TEXT?
Instruction	This command sets/gets the equation in the Equation Editor. For valid parameters that can be used in this equation, refer to the Equation Editor.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>: represents the equation in the Equation Editor.
Return	String
Default	None
Menu	Math > Analysis > Equation editor
Example	:CALCulate1:EQUation:TEXT "S11/S22" :CALCulate1:EQUation:TEXT? Return: S11/S22 :CALCulate1:TRACe1:EQUation:TEXT "S11/S22" :CALCulate1:TRACe1:EQUation:TEXT? Return: S11/S22

3.7.2.5 Equation Valid

Command Format	:CALCulate<cnum>[:SELected]:EQUation:VALID? :CALCulate<cnum>:TRACe<tnum>:EQUation:VALID?
Instruction	This command returns False when the equation expression and label are correct but the required S-parameter data is not measured or if it

	refers the invalid corrected memory array.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean 1: Valid 0: Invalid
Default	None
Menu	Math > Analysis > Equation editor
Example	:CALCulate1:EQUation:VALID? :CALCulate1:TRACe1:EQUation:VALID?

3.7.2.6 Equation State

Command Format	:CALCulate<cnum> [:SELected]:EQUation:STATE <bool> :CALCulate<cnum> [:SELected]:EQUation:STATE? :CALCulate<cnum>:TRACe<tnum>:EQUation:STATE <bool> :CALCulate<cnum>:TRACe<tnum>:EQUation:STATE?
Instruction	This command enables/disables the Equation Editor of the active trace of selected channel. This command enables/disables the Equation Editor of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Equation editor
Example	:CALCulate1:EQUation:TEXT 'S11/S22'

	:CALCulate1:EQUation:STATE ON :CALCulate1:EQUation:STATE? Return: 1 :CALCulate1:TRACe1:EQUation:STATE OFF :CALCulate1:TRACe1:EQUation:STATE? Return: 0

3.7.2.7 Trace Statistics State

Command Format	:CALCulate<cnum>[:SELected]:MSTatistics[:STATe] <bool> :CALCulate<cnum>[:SELected]:MSTatistics[:STATe]? :CALCulate<cnum>:TRACe<tnum>:MSTatistics[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:MSTatistics[:STATe]?
Instruction	This command displays and hides the trace statistics (peak-to-peak, mean, standard deviation) on the screen.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Statistics
Example	:CALCulate1:MSTatistics:STATe 1 :CALCulate1:MSTatistics:STATe? Return: 1 :CALCulate1:TRACe1:MSTatistics:STATe 0 :CALCulate1:TRACe1:MSTatistics:STATe? Return: 0

3.7.2.8 Statistics Type

Command Format	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:TYPE <type> :CALCulate<cnum>:MEASure<tnum>:FUNCtion:TYPE?
Instruction	This command sets statistic type of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={PTPeak|STDEV|MEAN}
Return	Enumeration
Default	PTPeak
Menu	None
Example	:CALCulate1:MEASure1:FUNCtion:TYPE MEAN :CALCulate1:MEASure1:FUNCtion:TYPE? Return: MEAN

3.7.2.9 Get Statistics Data

Command Format	:CALCulate<cnum>[:SELected]:MSTatistics:DATA? :CALCulate<cnum>:TRACe<tnum>:MSTatistics:DATA?
Instruction	Returns the trace statistic data for the selected statistic type for the specified channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	None

Example	:CALCulate1:TRACe1:MSTatistics:STATe 1 :CALCulate1:MEASure1:FUNCtion:TYPE MEAN :CALCulate1:TRACe1:MSTatistics:DATA? :CALCulate1:MSTatistics:DATA?

3.7.2.10 Statistics Range User Span State

Command Format	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STATe <bool> :CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STATe ?
Instruction	This command sets/gets whether the statistical range is set by the user.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Statistics Range > User Span
Example	:CALCulate1:MEASure1:FUNCtion:USER:RANGe:STATe 1 :CALCulate1:MEASure1:FUNCtion:USER:RANGe:STATe? Return: 1

3.7.2.11 User Span Statistics Range Start Frequency

Command Format	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STARt <numeric> :CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STARt ?

Instruction	This command sets/gets the start frequency of the user-defined statistical span in the statistics range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float, unit Hz
Default	Minimum frequency of the analyzer
Menu	Math > Analysis > Statistics Range > User Span > Start
Example	:CALCulate1:MEASure1:FUNCtion:USER:RANGe:STARt 10000 :CALCulate1:MEASure1:FUNCtion:USER:RANGe:STARt? Return: 10000

3.7.2.12 User Span Statistics Range Stop Frequency

Command Format	:CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STOP <numeric> :CALCulate<cnum>:MEASure<tnum>:FUNCtion:USER:RANGe:STOP ?
Instruction	This command sets/gets the stop frequency of the user-defined statistical span in the statistics range.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float, unit Hz
Default	Maximum frequency span of the analyzer
Menu	Math > Analysis > Statistics Range > User Span > Stop
Example	:CALCulate1:MEASure1:FUNCtion:USER:RANGe:STOP 10000

	:CALCulate1:MEASure1:FUNCtion:USER:RANGe:STOP? Return: 10000

3.7.2.13 Limit Test State

Command Format	:CALCulate<cnum>[:SELected]:LIMit[:STATe] <bool> :CALCulate<cnum>[:SELected]:LIMit[:STATe]? :CALCulate<cnum>:TRACe<tnum>:LIMit[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:LIMit[:STATe]?
Instruction	This command turns ON/OFF the limit test function, for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Limit Test ON
Example	:CALCulate1:LIMit ON :CALCulate1:LIMit? Return: 1 :CALCulate1:TRACe1:LIMit OFF :CALCulate1:TRACe1:LIMit? Return: 0

3.7.2.14 Limit Line State

Command Format	:CALCulate<cnum>[:SELected]:LIMit:DISPlay[:STATe] <bool> :CALCulate<cnum>[:SELected]:LIMit:DISPlay[:STATe]? :CALCulate<cnum>:TRACe<tnum>:LIMit:DISPlay[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:LIMit:DISPlay[:STATe]?

Instruction	This command turns ON/OFF the limit line display, for the active trace of selected channel. This command turns ON/OFF the limit line display of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Limit Line ON
Example	:CALCulate1:LIMit:DISPlay ON :CALCulate1:LIMit:DISPlay? Return: 1 :CALCulate1:TRACe1:LIMit:DISPlay OFF :CALCulate1:TRACe1:LIMit:DISPlay? Return: 0

3.7.2.15 Limit Sound State

Command Format	:CALCulate<cnum>:TRACe<tnum>:LIMit:SOUNd[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:LIMit:SOUNd[:STATe]?
Instruction	This command turns ON/OFF the limit testing fail sound of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	Math > Analysis > Limit… > Test Sound ON
Example	:CALCulate1:MEASure:LIMit:SOUNd ON :CALCulate1:MEASure:LIMit:SOUNd? Return: 1

3.7.2.16 Display of limit test failure points

Command Format	SYSTem:PREFerences:ITEM:RTOF <bool> SYSTem:PREFerences:ITEM:RTOF?
Instruction	Set and return whether to display limit line failures as red trace segments or red data points (dots).
Parameter Type	<bool>:= ON|OFF|1|0 ON (1) Display failures as red trace segments. (Red Trace On Fail). OFF (0) Display failures as red data points (dots).
Return	Boolean
Default	1
Menu	Math > Analysis > Limit… > Display
Example	SYSTem:PREFerences:ITEM:RTOF 0 SYSTem:PREFerences:ITEM:RTOF? Return :0

3.7.2.17 Globle Fail Sign

Command Format	:DISPlay:FSIGn <bool> :DISPlay:FSIGn?
Instruction	Shows or hides the window which displays global pass/fail results.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	Math > Analysis > Limit… > Global Pass/Fail ON
Example	:DISPlay:FSIGn 1 :DISPlay:FSIGn? Return: 1

3.7.2.18 Get Limit Test Result

Command Format	:CALCulate<cnum>[:SELected]:LIMit:FAIL? :CALCulate<cnum>:TRACe<tnum>:LIMit:FAIL?
Instruction	This command reads the limit test result, for the active trace of selected channel. This command reads the limit test result of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean 1: Fail 0: Pass
Default	None
Menu	None
Example	:CALCulate1:LIMit:FAIL? :CALCulate1:TRACe1:LIMit:FAIL?

3.7.2.19 Limit Table

Command Format	:CALCulate<cnum>[:SELected]:LIMit:DATA <numeric 1>, … ,<numeric 1+(N*5)>

	:CALCulate<cnum>[:SELected]:LIMit:DATA? :CALCulate<cnum>:TRACe<tnum>:LIMit:DATA <numeric 1>, ... ,<numeric 1+(N*5)> :CALCulate<cnum>:TRACe<tnum>:LIMit:DATA?
Instruction	This command sets/gets the limit table for the limit test, for the active trace of selected channel This command sets/gets the limit table for the limit test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric 1>, ... ,<numeric 1+(N*5)>:Indicates the array data (for limit line) of 1 + Num (number of limit lines)*5. Where n is an integer between 1 and Num. Data(0) :The number of limit lines you want to set. Specify an integer ranging 0 to 100. When the number of limit lines is set to 0 (clears the limit table), the variable Data is only required with Data(0). Data(n*5-4) :The type of the n-th line. Specify an integer 0 to 2 as follows. 0:OFF 1:Upper limit line 2:Lower limit line Data(n*5-3) :The value on the horizontal axis (frequency/power/time) of the start point of the n-th line. Data(n*5-2) :The value on the horizontal axis (frequency/power/time) of the end point of the n-th line. Data(n*5-1) :The value on the vertical axis of the start point of the n-th line. Data(n*5) :The value on the vertical axis of the end point of the n-th line. The index of the array starts from 0.
Return	Data Array

Default	None
Menu	Math > Analysis > Limit Table
Example	:CALCulate1:LIMit:DATA 2,1,1E9,3E9,0,0,2,1E9,3E9,-3,-3 :CALCulate1:LIMit:DATA? Return: 2,1,1000000000,3000000000,0,0,2,1000000000,3000000000,-3,-3 :CALCulate1:TRACe1:LIMit:DATA 2,2,2E9,3E9,-3,0,1,2E9,3E9,-5,-3 :CALCulate1:TRACe1:LIMit:DATA? Return: 2,2,2000000000,3000000000,-3,0,1,2000000000, 3000000000,-5,-3

3.7.2.20 Get Limit All Report

Command Format	:CALCulate<cnum>[:SELected]:LIMit:REPort:ALL? :CALCulate<cnum>:TRACe<tnum>:LIMit:REPort:ALL?
Instruction	This command reads the bandwidth test results (stimulus value, limit test result, upper limit value and lower limit value of all measurement points), for the active trace of selected channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Data array Indicates the array data (for limit line) of NOP (number of measurement points)x4. Where n is an integer between 1 and NOP. Data(nx4-3) The stimulus value for the measurement point. Data(nx4-2) The limit test result. Specify an integer -1 to 1 as follows. -1:No limit 0:Fail 1:Pass Data(nx4-1) The upper limit value at the measurement point. (If there is no limit at this point, reads out the 0.) Data(nx4) The lower limit value at the measurement point. (If there is

	no limit at this point, reads out the 0.) The index of the array starts from 0.
Default	None
Menu	None
Example	:CALCulate1:LIMit:REPort:ALL? :CALCulate1:TRACe1:LIMit:REPort:ALL?

3.7.2.21 Get Limit Failed Points

Command Format	:CALCulate<cnum>[:SELected]:LIMit:REPort:POINts? :CALCulate<cnum>:TRACe<tnum>:LIMit:REPort:POINts?
Instruction	This command reads the number of the measurement points that failed the limit test, for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Integer
Default	None
Menu	None
Example	:CALCulate1:LIMit:REPort:POINts? :CALCulate1:TRACe1:LIMit:REPort:POINts?

3.7.2.22 Get Limit Failed Data

Command Format	:CALCulate<cnum>[:SELected]:LIMit:REPort[:DATA]? :CALCulate<cnum>:TRACe<tnum>:LIMit:REPort[:DATA]?
Instruction	This command reads the stimulus values (frequency, power level or time) at all the measurement points that failed the limit test, for the active trace of selected channel.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Data array Indicates the array data for failed measurement points.
Default	None
Menu	None
Example	:CALCulate1:LIMit:REPort? :CALCulate1:TRACe1:LIMit:REPort?

3.7.2.23 Table Display Type

Command Format	:DISPlay:WINDow<wnum>:TABLe <type> :DISPlay:WINDow<wnum>:TABLe?
Instruction	This command selects the type of the window that appears in the lower part of the window display, for the selected window.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <type>:={MARKer|LIMit|SEGMent|RLIMit|PLIMit|OFF}
Return	Enumeration
Default	OFF
Menu	Marker > Marker Setup > Marker Table Math > Analysis > Limit Table > Limit Math > Analysis > Limit Table > Ripple Math > Analysis > Limit Table > Point Limit Sweep > Segment Table > Show Table
Example	:DISPlay:WINDow2:TABLe RLIMit :DISPlay:WINDow2:TABLe? Return: RLIM

3.7.2.24 Load Limit Table

Command Format	:MMEMory:LOAD:LIMit <string>
Instruction	This command recalls the specified limit table file, from the limit table for the active trace of the active channel.
Parameter Type	<string>: represents the specified limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Math > Analysis > Limit… > Load Table
Example	:MMEMory:LOAD:LIMit "local/test.csv"

3.7.2.25 Store Limit Table

Command Format	:MMEMory:STORE:LIMit <string>
Instruction	This command saves the limit table of the active trace of the active channel into a file in the CSV format (extension ".csv").If a file with the same name as the specified file name exists, its contents are overwritten.
Parameter Type	<string>: represents the specified limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Math > Analysis > Limit… > Save Table
Example	:MMEMory:STORE:LIMit "local/test.csv"

3.7.2.26 Point Limit Test State

Command Format	:CALCulate<cnum>[:SELected]:PLIMit[:STATe] <bool> :CALCulate<cnum>[:SELected]:PLIMit[:STATe]? :CALCulate<cnum>:TRACe<tnum>:PLIMit[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:PLIMit[:STATe]?
Instruction	This command turns ON/OFF the point limit test function for the active trace of selected channel. This command turns ON/OFF the point limit test function for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Point Limit
Example	:CALCulate1:PLIMit ON :CALCulate1:PLIMit? Return: 1 :CALCulate1:TRACe1:PLIMit OFF :CALCulate1:TRACe1:PLIMit? Return: 0

3.7.2.27 Point Limit Line State

Command Format	:CALCulate<cnum>[:SELected]:PLIMit:DISPlay:LINE <bool> :CALCulate<cnum>[:SELected]:PLIMit:DISPlay:LINE? :CALCulate<cnum>:TRACe<tnum>:PLIMit:DISPlay:LINE <bool> :CALCulate<cnum>:TRACe<tnum>:PLIMit:DISPlay:LINE?
Instruction	This command turns ON/OFF the point limit line display, for the active trac of selected channel (Ch).

	This command turns ON/OFF the point limit line display, for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Point Limit
Example	:CALCulate1:PLIMit:DISPlay:LINE ON :CALCulate1:PLIMit:DISPlay:LINE? Return: 1 :CALCulate1:TRACe1:PLIMit:DISPlay:LINE OFF :CALCulate1:TRACe1:PLIMit:DISPlay:LINE? Return: 0

3.7.2.28 Point Limit Test Sound State

Command Format	:CALCulate<cnum>:MEASure<tnum>:PLIMit:SOUNd <bool> :CALCulate<cnum>:MEASure<tnum>:PLIMit:SOUNd?
Instruction	This command gets/sets Point limit testing fail sound state.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Point Limit

Example	:CALCulate1:MEASure1:PLIMit:SOUNd ON :CALCulate1:MEASure1:PLIMit:SOUNd? Return: 1

3.7.2.29 Point Limit Test Result

Command Format	:CALCulate<cnum>[:SELected]:PLIMit:FAIL? :CALCulate<cnum>:TRACe<tnum>:PLIMit:FAIL?
Instruction	This command reads the point test result for the active trace of selected channel (Ch). This command reads the point test result for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean 1: Fail 0: Pass
Default	None
Menu	None
Example	:CALCulate1:PLIMit:FAIL? :CALCulate1:TRACe1:PLIMit:FAIL?

3.7.2.30 Get Point Limit test report

Command Format	:CALCulate<cnum>[:SELected]:PLIMit:REPort[:DATA]? :CALCulate<cnum>:TRACe<tnum>:PLIMit:REPort[:DATA]?
Instruction	This command reads all test results with indexes of active point limits for the active trace of selected channel (Ch). This command reads all test results with indexes of active point limits

	for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Indicates the array data of 1 + Num (active number of point limits)*2. The head value is number of active limits, first of 2 is limit index, and second is fail state. Returns the below result for each measurement point: ({Number of active limit}, 1 , Result (pass=0 , fail=1), 2, Result (pass=0 , fail=1), ,,, {point no}, results
Default	0
Menu	Math > Analysis > Limit… > Point Limit
Example	:CALCulate1:PLIMit:REPort? :CALCulate1:TRACe1:PLIMit:REPort?

3.7.2.31 Point Limit Data

Command Format	:CALCulate<cnum>[:SELected]:PLIMit:DATA <string> :CALCulate<cnum>[:SELected]:PLIMit:DATA? :CALCulate<cnum>:TRACe<tnum>:PLIMit:DATA <string> :CALCulate<cnum>:TRACe<tnum>:PLIMit:DATA?
Instruction	This command sets/gets the list of point limit test for the active trace of selected channel (Ch). This command sets/gets the list of point limit test for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>: the list of point limit test for the active trace. Returns the below result for each point:

	{Number of Limit}, {State for point 1(On=1, Off=0)}, {Stimulus for point 1}, {Lower Limit for point 1}, {Uppder Limit for point 1} ,,,, {State for point n(On=1, Off=0)}, {Stimulus for point n}, {Lower Limit for point n}, {Uppder Limit for point n}
Return	Data array
Default	None
Menu	Math > Analysis > Limit… > Point Limit
Example	:CALC1:PLIM:DATA 2,1,1E9,-2,3,1,4E9,2,5 :CALC1:PLIM:DATA? Return: 2,1,1000000000,-2,3,1,4000000000,2,5 :CALCulate1:TRACe1:PLIMit:DATA 2,1,1E9,-2,3,0,4E9,-5,-3 :CALCulate1:TRACe1:PLIMit:DATA? Return: 2,1,1000000000,-2,3,0,4000000000,-5,-3

3.7.2.32 Load Point Limit Table

Command Format	:MMEMory:LOAD:PLIMit <string>
Instruction	This command recalls the specified point limit table file, from the point limit table for the active trace of the active channel.
Parameter Type	<string>: represents the specified point limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Math > Analysis > Limit… > Point Limit > Load Table
Example	:MMEMory:LOAD:PLIMit "local/test.csv"

3.7.2.33 Store Point Limit Table

Command Format	:MMEMory:STORE:RLIMit <string>
Instruction	This command saves the point limit table of the active trace of the

	active channel into a file in the CSV format (extension ".csv").If a file with the same name as the specified file name exists, its contents are overwritten.
Parameter Type	<string>: represents the specified point limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Math > Analysis > Limit… > Point Limit > Save Table
Example	:MMEMory:STORE:PLIMit "local/test.csv"

3.7.2.34 Ripple Limit Test State

Command Format	:CALCulate<cnum>[:SELected]:RLIMit[:STATe] <bool> :CALCulate<cnum>[:SELected]:RLIMit[:STATe]? :CALCulate<cnum>:TRACe<tnum>:RLIMit[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:RLIMit[:STATe]?
Instruction	This command turns ON/OFF the ripple test function for the active trace of selected channel. This command turns ON/OFF the ripple test function for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Ripple
Example	:CALCulate1:RLIMit ON :CALCulate1:RLIMit? Return: 1

	:CALCulate1:TRACe1:RLIMit OFF :CALCulate1:TRACe1:RLIMit? Return: 0

3.7.2.35 Ripple Limit Line State

Command Format	:CALCulate<cnum>[:SELected]:RLIMit:DISPlay:LINE <bool> :CALCulate<cnum>[:SELected]:RLIMit:DISPlay:LINE? :CALCulate<cnum>:TRACe<tnum>:RLIMit:DISPlay:LINE <bool> :CALCulate<cnum>:TRACe<tnum>:RLIMit:DISPlay:LINE?
Instruction	This command turns ON/OFF the ripple limit line display, for the active trac of selected channel (Ch). This command turns ON/OFF the ripple limit line display, for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Ripple
Example	:CALCulate1:RLIMit:DISPlay:LINE ON :CALCulate1:RLIMit:DISPlay:LINE? Return: 1 :CALCulate1:TRACe1:RLIMit:DISPlay:LINE OFF :CALCulate1:TRACe1:RLIMit:DISPlay:LINE? Return: 0

3.7.2.36 Ripple Limit Test Sound State

Command Format	:CALCulate<cnum>:MEASure<tnum>:RLIMit:SOUNd <bool> :CALCulate<cnum>:MEASure<tnum>:RLIMit:SOUNd?
Instruction	This command gets/sets Ripple limit testing fail sound state.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Ripple
Example	:CALCulate1:MEASure1:RLIMit:SOUNd ON :CALCulate1:MEASure1:RLIMit:SOUNd? Return: 1

3.7.2.37 Ripple Limit Test Result

Command Format	:CALCulate<cnum>[:SELected]:RLIMit:FAIL? :CALCulate<cnum>:TRACe<tnum>:RLIMit:FAIL?
Instruction	This command reads the ripple test result for the active trace of selected channel (Ch). This command reads the ripple test result for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean 1: Fail 0: Pass
Default	None

Menu	None
Example	:CALCulate1:RLIMit:FAIL? :CALCulate1:TRACe1:RLIMit:FAIL?

3.7.2.38 Ripple Limit Data

Command Format	:CALCulate<cnum>[:SELected]:RLIMit:DATA <string> :CALCulate<cnum>[:SELected]:RLIMit:DATA? :CALCulate<cnum>:TRACe<tnum>:RLIMit:DATA <string> :CALCulate<cnum>:TRACe<tnum>:RLIMit:DATA?
Instruction	This command sets/gets the ripple limit table for the active trace of selected channel (Ch). This command sets/gets the ripple limit table for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>:Indicates the array data (for ripple line) of 1 + Num (number of limit lines)\4. Where n is an integer between 1 and Num. Data(0) :The number of limit lines you want to set. Specify an integer ranging 0 to 12. When the number of limit lines is set to 0 (clears the limit table), the variable Data is only required with Data(0). Data(nx4-3) :The type of the n-th line. Specify an integer 0 to 1 as follows. 0:UNUSED 1:ON 2:OFF Data(nx4-2) :The value on the horizontal axis (frequency/power/time) of the start point of the n-th line. Data(nx4-1) :The value on the horizontal axis (frequency/power/time) of the end point of the n-th line. Data(nx4) :The ripple line value (dB) of the n-th line. The index of the array starts from 0.

Return	Data array
Default	None
Menu	Math > Analysis > Limit... > Ripple
Example	:CALC1:RLIM:DATA 2,1,1E9,3E9,3,1,5E9,7E9,3 :CALC1:RLIM:DATA? Return: 2,1,1000000000,3000000000,3,1,5000000000,7000000000,3 :CALCulate1:TRACe1:RLIMit:DATA 2,1,1E9,2E9,3,0,5E9,6E9,-3 :CALCulate1:TRACe1:RLIMit:DATA? Return: 2,1,1000000000,2000000000,3,0,5000000000,6000000000,-3

3.7.2.39 Get Ripple Result

Command Format	:CALCulate<cnum>[:SELected]:RLIMit:REPort[:DATA]? :CALCulate<cnum>:TRACe<tnum>:RLIMit:REPort[:DATA]?
Instruction	This command reads the ripple value of the ripple test for the active trace of selected channel (Ch). This command reads the ripple value of the ripple test for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Indicates the array data (for ripple line) of 1 + Num (number of limit lines)*3. Where n is an integer between 1 and 12. Data(0): Number of ripple limit line. Data(nx3-2): Number of ripple limit bands. Data(nx3-1): Ripple value. Data(nx3): Results of ripple test. Select from the following. 0: PASS 1: FAIL.

	The index of the array starts from 0.
Default	0
Menu	Math > Analysis > Limit… > Ripple
Example	:CALCulate1:RLIMit:REPort? :CALCulate1:TRACe1:RLIMit:REPort?

3.7.2.40 Load Ripple Limit Table

Command Format	:MMEMory:LOAD:RLIMit <string>
Instruction	This command recalls the specified ripple limit table file, from the ripple limit table for the active trace of the active channel.
Parameter Type	<string>: represents the specified ripple limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Math > Analysis > Limit… > Ripple > Load Table
Example	:MMEMory:LOAD:RLIMit "local/test.csv"

3.7.2.41 Store Ripple Limit Table

Command Format	:MMEMory:STORE:RLIMit <string>
Instruction	This command saves the ripple limit table of the active trace of the active channel into a file in the CSV format (extension ".csv").If a file with the same name as the specified file name exists, its contents are overwritten.
Parameter Type	<string>: represents the specified ripple limit table file, and the parameter range: 255 characters or less.
Return	None
Default	None

Menu	Math > Analysis > Limit… > Ripple > Save Table
Example	:MMEMory:STORE:RLIMit "local/test.csv"

3.7.2.42 Bandwidth Test State

Command Format	:CALCulate<cnum>[:SELected]:BLIMit[:STATe] <bool> :CALCulate<cnum>[:SELected]:BLIMit[:STATe]? :CALCulate<cnum>:TRACe<tnum>:BLIMit[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:BLIMit[:STATe]?
Instruction	This command turns ON/OFF the bandwidth test function, for the active trace of selected channel. This command turns ON/OFF the bandwidth test function of the selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Bandwidth
Example	:CALCulate1:BLIMit ON :CALCulate1:BLIMit? Return: 1 :CALCulate1:TRACe1:BLIMit OFF :CALCulate1:TRACe1:BLIMit? Return: 0

3.7.2.43 Bandwidth Test Value State

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:DISPlay:VALue <bool> :CALCulate<cnum>[:SELected]:BLIMit:DISPlay:VALue? :CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:VALue <bool> :CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:VALue?
Instruction	This command turns ON/OFF the bandwidth value display of the bandwidth test, for the active trace of selected channel. This command turns ON/OFF the bandwidth value display of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	None
Example	:CALCulate1:BLIMit:DISPlay:VALue ON :CALCulate1:BLIMit:DISPlay:VALue? Return: 1 :CALCulate1:TRACe1:BLIMit:DISPlay:VALue OFF :CALCulate1:TRACe1:BLIMit:DISPlay:VALue? Return: 0

3.7.2.44 Bandwidth Test Marker State

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:DISPlay:MARKer <bool> :CALCulate<cnum>[:SELected]:BLIMit:DISPlay:MARKer? :CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:MARKer <bool> :CALCulate<cnum>:TRACe<tnum>:BLIMit:DISPlay:MARKer?
Instruction	This command turns ON/OFF the marker display of the bandwidth test, for the active trace of selected channel.

	This command turns ON/OFF the marker display of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Analysis > Limit… > Bandwidth > Bandwidth Marker On
Example	:CALCulate1:BLIMit:DISPlay:MARKer ON :CALCulate1:BLIMit:DISPlay:MARKer? Return: 1 :CALCulate1:TRACe1:BLIMit:DISPlay:MARKer OFF :CALCulate1:TRACe1:BLIMit:DISPlay:MARKer? Return: 0

3.7.2.45 Bandwidth Test Threshold

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:DB <numeric> :CALCulate<cnum>[:SELected]:BLIMit:DB? :CALCulate<cnum>:TRACe<tnum>:BLIMit:DB <numeric> :CALCulate<cnum>:TRACe<tnum>:BLIMit:DB?
Instruction	This command sets/gets the bandwidth threshold value (attenuation from the peak) of the bandwidth test, for the selected channel. This command sets/gets the bandwidth threshold value (attenuation from the peak) of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<numeric>:represents the bandwidth threshold value (attenuation from the peak) of the bandwidth test, and the parameter range: 0-500MdB.
Return	Float, unit: dB
Default	3
Menu	Math > Analysis > Limit… > Bandwidth > N dB Points
Example	:CALCulate1:BLIMit:DB 3.5 :CALCulate1:BLIMit:DB? Return: 3.5 :CALCulate1:TRACe1:BLIMit:DB 4 :CALCulate1:TRACe1:BLIMit:DB? Return: 4

3.7.2.46 Bandwidth Test MiNimum

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:MiNimum <numeric> :CALCulate<cnum>[:SELected]:BLIMit:MiNimum? :CALCulate<cnum>:TRACe<tnum>:BLIMit:MiNimum <numeric> :CALCulate<cnum>:TRACe<tnum>:BLIMit:MiNimum?
Instruction	This command sets/gets the lower limit value of the bandwidth test, for the selected channel. This command sets/gets the lower limit value of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the lower limit value.
Return	Float
Default	10kHz
Menu	Math > Analysis > Limit… > Bandwidth > Min Bandwidth

Example	:CALCulate1:BLIMit:MiNimum 2000000 :CALCulate1:BLIMit:MiNimum? Return: 2000000 :CALCulate1:TRACe1:BLIMit:MiNimum 5000000 :CALCulate1:TRACe1:BLIMit:MiNimum? Return: 5000000

3.7.2.47 Bandwidth Test Maximum

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:MAXimum <numeric> :CALCulate<cnum>[:SELected]:BLIMit:MAXimum? :CALCulate<cnum>:TRACe<tnum>:BLIMit:MAXimum <numeric> :CALCulate<cnum>:TRACe<tnum>:BLIMit:MAXimum?
Instruction	This command sets/gets the upper limit value of the bandwidth test, for the selected channel. This command sets/gets the upper limit value of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the upper limit value.
Return	Float
Default	300kHz
Menu	Math > Analysis > Limit… > Bandwidth > Max Bandwidth
Example	:CALCulate1:BLIMit:MAXimum 3500000 :CALCulate1:BLIMit:MAXimum? Return: 3500000 :CALCulate1:TRACe1:BLIMit:MAXimum 4000000 :CALCulate1:TRACe1:BLIMit:MAXimum? Return: 4000000

3.7.2.48 Get Bandwidth Test Fail Result

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:FAIL? :CALCulate<cnum>:TRACe<tnum>:BLIMit:FAIL?
Instruction	This command gets the bandwidth limit test results, for the active trace of selected channel. This command gets the bandwidth limit test results, for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean 1: Pass 0: Fail
Default	None
Menu	None
Example	:CALCulate1:BLIMit:FAIL? :CALCulate1:TRACe1:BLIMit:FAIL?

3.7.2.49 Bandwidth Test Report Data

Command Format	:CALCulate<cnum>[:SELected]:BLIMit:REPort[:DATA]? :CALCulate<cnum>:TRACe<tnum>:BLIMit:REPort[:DATA]?
Instruction	This command reads the bandwidth value of the bandwidth test, for the active trace of selected channel. This command reads the bandwidth value of the bandwidth test of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.

	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float
Default	None
Menu	None
Example	:CALCulate1:BLIMit:REPort? :CALCulate1:TRACe1:BLIMit:REPort?

3.7.3 Time Domain

3.7.3.1 Command List

Transform State	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STATe
Transform Start	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STARt
Transform Stop	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STOP
Transform Center	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:CENTer
Transform Span	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:SPAN
Transform Mode	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME[:TYPE]
Transform Stimulus	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STIMulus
Transform Set Low Pass Frequencies	:CALCulate<cnum>:TRACe<tnum>:TRANsform:LPFRequency
Transform Auto Extrapolate	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCS Param:AUTO
Transform manual Extrapolate value	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCS Param
Set Auto Extrapolate to manual value	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCS Param:EXTRapolate

3.7.3.2 Transform State

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:STATe <bool>

	:CALCulate<cnum>[:SELected]:TRANsform:TIME:STATe? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STATe <bool> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STATe?
Instruction	This command turns ON/OFF the transformation function of the time domain function, for the active trace of selected channel. This command turns ON/OFF the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Time Domain > Transform
Example	:CALCulate1:TRANsform:TIME:STATe ON :CALCulate1:TRANsform:TIME:STATe? Return: 1 :CALCulate1:TRACe1:TRANsform:TIME:STATe OFF :CALCulate1:TRACe1:TRANsform:TIME:STATe? Return: 0

3.7.3.3 Transform Start

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:STARt <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:STARt? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STARt <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STARt?
Instruction	This command sets/gets the start value of the transformation used for the transformation function of the time domain function, for the active trace of selected channel.

	This command sets/gets the start value of the transformation used for the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the start time.
Return	Float, unit s(second)
Default	None
Menu	Math > Time Domain > Start Time
Example	:CALCulate1:TRANsform:TIME:STARt -1e-9 :CALCulate1:TRANsform:TIME:STARt? Return: -1e-09 :CALCulate1:TRACe1:TRANsform:TIME:STARt 1e-9 :CALCulate1:TRACe1:TRANsform:TIME:STARt? Return: 1e-09

3.7.3.4 Transform Stop

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:STOP <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:STOP? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STOP <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STOP?
Instruction	This command sets/gets the stop value of the transformation used for the transformation function of the time domain function, for the active trace of selected channel. This command sets/gets the stop value of the transformation used for the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the stop time.
Return	Float, unit s(second)
Default	None
Menu	Math > Time Domain > Stop Time
Example	:CALCulate1:TRANsform:TIME:STOP 20e-9 :CALCulate1:TRANsform:TIME:STOP? Return: 2e-08 :CALCulate1:TRACe1:TRANsform:TIME:STOP 15e-9 :CALCulate1:TRACe1:TRANsform:TIME:STOP? Return: 1.5e-08

3.7.3.5 Transform Center

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:CENTer <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:CENTer? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:CENTer <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:CENTer?
Instruction	This command sets/gets the center value of the transformation used for the transformation function of the time domain function, for the active trace of selected channel This command sets/gets the center value of the transformation used for the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the center time.

Return	Float, unit s(second)
Default	None
Menu	Math > Time Domain > Center Time
Example	:CALCulate1:TRANsform:TIME:CENTer 12e-9 :CALCulate1:TRANsform:TIME:CENTer? Return: 1.2e-08 :CALCulate1:TRACe1:TRANsform:TIME:CENTer 15e-9 :CALCulate1:TRACe1:TRANsform:TIME:CENTer? Return: 1.5e-08

3.7.3.6 Transform Span

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:SPAN <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:SPAN? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:SPAN <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:SPAN?
Instruction	This command sets/gets the span value of the transformation used for the transformation function of the time domain function, for the active trace of selected channel. This command sets/gets the span value of the transformation used for the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the span time.
Return	Float, unit s(second)
Default	None
Menu	Math > Time Domain > Span Time

Example	:CALCulate1:TRANsform:TIME:SPAN 10e-9 :CALCulate1:TRANsform:TIME:SPAN? Return: 1e-08 :CALCulate1:TRACe1:TRANsform:TIME:SPAN 15e-9 :CALCulate1:TRACe1:TRANsform:TIME:SPAN? Return: 1.5e-08

3.7.3.7 Transform Mode

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME[:TYPE] <type> :CALCulate<cnum>[:SELected]:TRANsform:TIME[:TYPE]? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME[:TYPE] <type> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME[:TYPE]?
Instruction	This command sets/gets the transformation type used for the transformation function of the time domain function, for the active trace of selected channel. This command sets/gets the transformation type used for the transformation function of the time domain function, for the selected trace and selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={BPASs|LPASs}
Return	Enumeration
Default	BPASs
Menu	Math > Time Domain > TD Mode
Example	:CALCulate1:TRANsform:TIME LPASs :CALCulate1:TRANsform:TIME? Return: LPAS :CALCulate1:TRACe1:TRANsform:TIME BPASs :CALCulate1:TRACe1:TRANsform:TIME?

	Return: BPAS

3.7.3.8 Transform Stimulus

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:STIMulus <type> :CALCulate<cnum>[:SELected]:TRANsform:TIME:STIMulus? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STIMulus <type> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:STIMulus?
Instruction	This command sets/gets the stimulus type used for the transformation function of the time domain function, for the active trace of selected channel. This command sets/gets the stimulus type used for the transformation function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={IMPulse|STEP}
Return	Enumeration
Default	IMPulse
Menu	Math > Time Domain > TD Mode
Example	:CALCulate1:TRANsform:TIME LPASs :CALCulate1:TRANsform:TIME:STIMulus STEP :CALCulate1:TRANsform:TIME:STIMulus? Return: STEP :CALCulate1:TRACe1:TRANsform:TIME LPASs :CALCulate1:TRACe1:TRANsform:TIME:STIMulus IMPulse :CALCulate1:TRACe1:TRANsform:TIME:STIMulus? Return: IMP

3.7.3.9 Transform Set Low Pass Frequencies

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:LPFRequency :CALCulate<cnum>:TRACe<tnum>:TRANsform:LPFRequency
Instruction	Sets the start frequencies in LowPass Mode, for the active trace. Sets the start frequencies in LowPass Mode, for the selected channel and the trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	Math > Time Domain > Time Domain Setup… > Transform > Set Low Pass Frequencies
Example	:CALCulate1:TRANsform:TIME:LPFRequency :CALCulate1:TRACe1:TRANsform:TIME:LPFRequency

3.7.3.10 Transform Auto Extrapolate

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:LPASs:DCSParam:AUTO <bool> :CALCulate<cnum>[:SELected]:TRANsform:TIME:LPASs:DCSParam:AUTO? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCSParam:AUTO <bool> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCSParam:AUTO?
Instruction	sets/gets the active trace low-pass mode time domain conversion automatic DC extrapolation mode, for the active trace of selected channel. sets/gets the time domain conversion automatic DC extrapolation mode of the low-pass mode of selected trace for the selected channel.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	On
Menu	Math > Time Domain > Time Domain Setup... > Advance > Auto Extrapolate
Example	:CALCulate1:SELected1:TRANsform:TIME:LPASs:DCSParam:AUTO OFF :CALCulate1:SELected1:TRANsform:TIME:LPASs:DCSParam:AUTO? Return:0 :CALCulate1:TRACe1:TRANsform:TIME:LPASs:DCSParam:AUTO ON :CALCulate1:TRACe1:TRANsform:TIME:LPASs:DCSParam:AUTO? Return:1

3.7.3.11 Transform manual Extrapolate value

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:LPASs:DCSParam <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:LPASs:DCSParam? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCSParam <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCSParam?
Instruction	sets/gets the time domain conversion DC extrapolation mode to manual of the low-pass mode of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not

	specified, <tnum> defaults to 1. <numeric>:represents the DC extrapolation value, and the parameter range: -1E15~1E15.
Return	Float
Default	1
Menu	Math > Time Domain > Time Domain Setup… > Advance > Manual Entry
Example	:CALCulate1:SELected1:TRANsform:TIME:LPASs:DCSParam 9 :CALCulate1:SELected1:TRANsform:TIME:LPASs:DCSParam? Return:9 :CALCulate1:TRACe1:TRANsform:TIME:LPASs:DCSParam 11 :CALCulate1:TRACe1:TRANsform:TIME:LPASs:DCSParam? Return:11

3.7.3.12 Set Auto Extrapolate to manual value

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:LPASs:DCSParam:EXTRapolate :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:LPASs:DCSParam:EXTRapolate
Instruction	Sets the time domain conversion automatic DC extrapolation value to manual value of the low-pass mode of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	Math > Time Domain > Time Domain Setup… > Advance > Extrapolate

Example	:CALCulate1:SELected:TRANsform:TIME:LPASs:DCSParam:EXTRapolate

3.7.4 Time Gating

3.7.4.1 Command List

Gating State	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STATe
Gating Start	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STARt
Gating Stop	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STOP
Gating Center	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:CENTer
Gating Span	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SPAN
Gating Type	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:TYPE
Gating Shape	:CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SHAPE
Time Domain Window Impulse Width	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:IMPulse:WIDTh
Time Domain Window Kaiser Beta	:CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:KBESsel

3.7.4.2 Gating State

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STATe <bool> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STATe? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STATe <bool> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STATe?
Instruction	This command turns ON/OFF the gating function of the time domain function, for the active trace of selected channel. This command turns ON/OFF the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > Time Gating > Gating
Example	:CALCulate1:FILTer:TIME:STATe ON :CALCulate1:FILTer:TIME:STATe? Return: 1 :CALCulate1:TRACe1:FILTer:TIME:STATe OFF :CALCulate1:TRACe1:FILTer:TIME:STATe? Return: 0

3.7.4.3 Gating Start

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STARt <numeric> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STARt? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STARt <numeric> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STARt?
Instruction	This command sets/gets the start value of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the start value of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the gating start time, and the parameter range: -250e-9, 250e-9.
Return	float, unit s(second)

Default	-250e-9
Menu	Math > Time Gating > Gate Start
Example	:CALCulate1:FILTer:TIME:STARt -1e-9 :CALCulate1:FILTer:TIME:STARt? Return: -1e-09 :CALCulate1:TRACe1:FILTer:TIME:STARt -2e-9 :CALCulate1:TRACe1:FILTer:TIME:STARt? Return: -2e-09

3.7.4.4 Gating Stop

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STOP <numeric> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:STOP? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STOP <numeric> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:STOP?
Instruction	This command sets/gets the stop value of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the stop value of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the gating stop time, and the parameter range: -250e-9, 250e-9.
Return	float, unit s(second)
Default	250e-9
Menu	Math > Time Gating > Gate Stop
Example	:CALCulate1:FILTer:TIME:STOP 10e-9

	:CALCulate1:FILTer:TIME:STOP? Return: 1e-08 :CALCulate1:TRACe1:FILTer:TIME:STOP 15e-9 :CALCulate1:TRACe1:FILTer:TIME:STOP? Return: 1.5e-08

3.7.4.5 Gating Center

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:CENTer <numeric> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:CENTer? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:CENTer <numeric> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:CENTer?
Instruction	This command sets/gets the center value of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the center value of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the gating center time.
Return	float, unit s(second)
Default	0
Menu	Math > Time Gating > Gate Center
Example	:CALCulate1:FILTer:TIME:CENTer 10e-9 :CALCulate1:FILTer:TIME:CENTer? Return: 1e-08 :CALCulate1:TRACe1:FILTer:TIME:CENTer 12e-9

	:CALCulate1:TRACe1:FILTer:TIME:CENTer? Return: 1.2e-08

3.7.4.6 Gating Span

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:SPAN <numeric> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:SPAN? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SPAN <numeric> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SPAN?
Instruction	This command sets/gets the span value of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the span value of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the gating span time.
Return	float, unit s(second)
Default	500e-9
Menu	Math > Time Gating > Gate Span
Example	:CALCulate1:FILTer:TIME:SPAN 10e-9 :CALCulate1:FILTer:TIME:SPAN? Return: 1e-08 :CALCulate1:TRACe1:FILTer:TIME:SPAN 15e-9 :CALCulate1:TRACe1:FILTer:TIME:SPAN? Return: 1.5e-08

3.7.4.7 Gating Type

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:TYPE <type> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:TYPE? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:TYPE <type> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:TYPE?
Instruction	This command sets/gets the type of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the type of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={BPASs| NOTCh}
Return	Enumeration
Default	BPASs
Menu	Math > Time Gating > Gate Type
Example	:CALCulate1:FILTer:TIME:TYPE NOTCh :CALCulate1:FILTer:TIME:TYPE? Return: NOTC :CALCulate1:TRACe1:FILTer:TIME:TYPE BPASs :CALCulate1:TRACe1:FILTer:TIME:TYPE? Return: BPAS

3.7.4.8 Gating Shape

Command Format	:CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:SHAPe <type> :CALCulate<cnum>[:SELected]:FILTer[:GATE]:TIME:SHAPe? :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SHAPE

	<type> :CALCulate<cnum>:TRACe<tnum>:FILTer[:GATE]:TIME:SHAPE?
Instruction	This command sets/gets the shape of the gate used for the gating function of the time domain function, for the active trace of selected channel. This command sets/gets the shape of the gate used for the gating function of the time domain function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={MAXimum|WIDE|NORMal|MINimum}
Return	Enumeration
Default	NORMal
Menu	Math > Time Gating > Gate Shape
Example	:CALCulate1:FILTer:TIME:SHAPe MINimum :CALCulate1:FILTer:TIME:SHAPe? Return: MIN :CALCulate1:TRACe1:FILTer:TIME:SHAPe WIDE :CALCulate1:TRACe1:FILTer:TIME:SHAPe? Return: WIDE

3.7.4.9 Time Domain Window Impulse Width

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:IMPulse:WIDTh <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:IMPulse:WIDTh? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:IMPulse:WIDTh <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:IMPulse: WIDTh?

Instruction	This command sets/gets the pulse width of the activation trace time domain window. This command sets/gets the pulse width of the time domain window for selecting channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the pulse width, and the parameter range: 141.965927ps~326.518527ps.
Return	Float, unit s(second)
Default	229.934230ps
Menu	Math > Time Domain > Time Domain Setup... > Window > Impulse Width
Example	:CALCulate1:TRANsform:TIME:IMPulse:WIDTh 1.77344558e-10 :CALCulate1:TRANsform:TIME:IMPulse:WIDTh? Return: 1.77344558e-10 :CALCulate1:TRACe1:TRANsform:TIME:IMPulse:WIDTh 1.77344558e-10 :CALCulate1:TRACe1:TRANsform:TIME:IMPulse:WIDTh? Return: 1.77344558e-10

3.7.4.10 Time Domain Window Kaiser Beta

Command Format	:CALCulate<cnum>[:SELected]:TRANsform:TIME:KBESsel <numeric> :CALCulate<cnum>[:SELected]:TRANsform:TIME:KBESsel? :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:KBESsel <numeric> :CALCulate<cnum>:TRACe<tnum>:TRANsform:TIME:KBESsel?
Instruction	This command sets/gets the Kaiser Beta value of the activation trace time domain window.

	This command sets/gets the Kaiser Beta value of the time domain window for selecting channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Kaiser Beta value, and the parameter range: 0~13.
Return	Float
Default	6
Menu	Math > Time Domain > Time Domain Setup… > Window > Kaiser Beta
Example	:CALCulate1:TRANsform:TIME:KBESsel 3.4 :CALCulate1:TRANsform:TIME:KBESsel? Return: 3.4 :CALCulate1:TRACe1:TRANsform:TIME:KBESsel 3.4 :CALCulate1:TRACe1:TRANsform:TIME:KBESsel? Return: 3.4

3.8 Marker Commands

3.8.1 Marker

3.8.1.1 Command List

Active Marker	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:ACTivate
Marker State	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>[:STATe]
Marker X Value	:CALCulate<cnum>:TRACe<tnum>:MARKer:X
Get Response and Stimulus Data of Marker	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:DATA?
Get Marker Y Value	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:Y?
Reference Marker State	:CALCulate<cnum>:TRACe<tnum>:MARKer:REFerence[:STATe]
All Marker Off	:CALCulate<cnum>:MEASure<tnum>:MARKer:AOFF

3.8.1.2 Active Marker

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:ACTivate :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:ACTivate
Instruction	This command sets the marker 1 to 9 (Mk) and reference marker (Mk:10) to the active marker. The marker on a trace that can be repositioned either by front panel controls or by programming commands, for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. 1 to 10 (10 is for the reference marker)
Default	None
Menu	Marker > Marker > Select
Example	:CALCulate1:MARKer3:ACTivate :CALCulate1:TRACe1:MARKer3:ACTivate

3.8.1.3 Marker State

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>[:STATe] <bool> :CALCulate<cnum>[:SELected]:MARKer<mnum>[:STATe]? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>[:STATe]? :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>[:STATe] <bool> :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum> [:STATe]?

Instruction	This command turns ON/OFF the display of marker 1 to 9 and reference marker (Mk:10), for the active trace of selected channel; This command turns ON/OFF the display of marker 1 to 9 and reference marker (Mk:10), for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	None
Example	:CALCulate1:MARKer2 ON :CALCulate1:MARKer2? Return: 1 :CALCulate1:TRACe1:MARKer2 OFF :CALCulate1:TRACe1:MARKer2? Return: 0 :CALCulate1:MEASure1:MARKer5 ON :CALCulate1:MEASure1:MARKer5? Return: 1

3.8.1.4 Marker X Value

Command Format	:CALCulate<cnum>[:SELected]:MARKer:X <numeric> :CALCulate<cnum>[:SELected]:MARKer:X? :CALCulate<cnum>:TRACe<tnum>:MARKer:X <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:X?

Instruction	This command set the stimulus value for marker 1 to 9 (Mk) and reference marker (Ch:10), for the active trace of selected channel. This command set the stimulus value for marker 1 to 9 (Mk) and reference marker (Ch:10), for the a selected ctive trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the stimulus value.
Return	float
Default	None
Menu	Marker > Marker > Marker x(x: 1-9 and R)
Example	:CALCulate1:MARKer1:X 1e9 :CALCulate1:MARKer1:X? Return: 1000000000 :CALCulate1:TRACe1:MARKer:X 2e9 :CALCulate1:TRACe1:MARKer:X? Return: 2000000000

3.8.1.5 Get Response and Stimulus Data of Marker

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:DATA? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:DATA?
Instruction	This command reads the response and stimulus value of marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel. This command reads the response and stimulus value of marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.
Return	Data array Indicates 3-element array data (response and stimulus of marker). Data(0) :Response value (primary value) at the marker position. Data(1) :Response value (secondary value) at the marker position. Always 0 when the data format is not the Smith chart format or the polar format. Data(2) :Stimulus value at the marker position. The index of the array starts from 0.
Default	None
Menu	None
Example	:CALCulate1:MARKer3:DATA? :CALCulate1:TRACe1:MARKer3:DATA?

3.8.1.6 Get Marker Y Value

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:Y? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:Y?
Instruction	Reads the marker's Y-axis value. The format of the value depends on the marker setup. If the marker is set as delta, the data is relative to the reference marker. The query always returns two numbers. Smith and Polar formats - (Real, Imaginary) All other formats - (Value,0)
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.

Return	Numeric
Default	None
Menu	None
Example	• Smith formats: :CALCulate1:MARKer1:Y? :CALCulate1:TRACe1:MARKer1:Y? Retrun : 39.3147784266,12.8101028317 • Not Smith or Polar formats: :CALCulate1:MARKer1:Y? :CALCulate1:TRACe1:MARKer1:Y? Return: -14.6367454451,0

3.8.1.7 Reference Marker State

Command Format	:CALCulate<cnum>[:SELected]:MARKer:REFerence[:STATe] <bool> :CALCulate<cnum>[:SELected]:MARKer:REFerence[:STATe]? :CALCulate<cnum>:TRACe<tnum>:MARKer:REFerence[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer:REFerence[:STATe]?
Instruction	This command turns ON/OFF the reference marker for the active trace of selected channel; This command turns ON/OFF the reference marker for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF

Menu	Marker > Marker > Reference Marker
Example	:CALCulate1:MARKer:REFerence ON :CALCulate1:MARKer:REFerence? Return: 1 :CALCulate1:TRACe1:MARKer:REFerence OFF :CALCulate1:TRACe1:MARKer:REFerence? Return: 0

3.8.1.8 All Marker Off

Command Format	:CALCulate<cnum>:MEASure<tnum>:MARKer:AOFF
Instruction	This command turns OFF all markers for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Boolean
Default	None
Menu	Marker > Marker > All Off
Example	:CALCulate1:TRACe1:MARKer3 ON :CALCulate1:MEASure1:MARKer:AOFF

3.8.2 Marker Setup

3.8.2.1 Commands List

Marker Delta	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:DELTa
Marker Discrete	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:DISCrete
Marker Type	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:TYPE

Marker Format	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FORMAT
Marker Couple	:CALCulate:MARKer:COUPle

3.8.2.2 Marker Delta

Command Format	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:DELTa <bool> :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:DELTa?
Instruction	This command turns ON/OFF the delta marker state, for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-9},represents the marker number. If not specified, <mnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Marker > Marker Setup > Delta
Example	:CALCulate1:MEASure:MARKer3:DELTa ON :CALCulate1:MEASure:MARKer3:DELTa? Return: 1

3.8.2.3 Marker Discrete

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:DISCrete <bool> :CALCulate<cnum>[:SELected]:MARKer<mnum>:DISCrete? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:DISCrete <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:DISCrete?

Instruction	This command turns ON/OFF the discrete mode (mode in which the marker moves only at the measurement points) with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Marker > Marker Setup > Discrete
Example	:CALCulate1:MARKer2:DISCrete ON :CALCulate1:MARKer2:DISCrete? Return: 1 :CALCulate1:TRACe1:MARKer3:DISCrete OFF :CALCulate1:TRACe1:MARKer3:DISCrete? Return: 0

3.8.2.4 Marker Type

Command Format	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:TYPE <type> :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:TYPE?
Instruction	This command sets the type of marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={NORMal|FIXed}
Return	Enumeration
Default	NORM
Menu	Marker > Marker Setup > Type
Example	:CALCulate1:MEASure:MARKer3:TYPE FIXed :CALCulate1:MEASure:MARKer3:TYPE? Return: FIX

3.8.2.5 Marker Format

Command Format	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FORMAT <type> :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FORMAT?
Instruction	This command sets the measure format with marker 1 to 9 and reference marker (Mk:10), for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={DEFault|MLINear|MLOGarithmic|IMPedance|ADMittance|PHASe|IMAGinary|REAL|POLar|GDELay|LINPhase|LOGPhase|SWR}
Return	Enumeration
Default	DEF
Menu	Marker > Marker Setup > Format
Example	:CALCulate1:MEASure1:MARKer3:FORMAT MLINear :CALCulate1:MEASure1:MARKer3:FORMAT? Return: MLIN

3.8.2.6 Marker Couple

Command Format	:CALCulate:MARKer:COUPle <type> :CALCulate:MARKer:COUPle?
Instruction	This command sets the marker coupling state.
Parameter Type	<type>:={ALL|CHANnel|OFF}
Return	ALL|CHAN|OFF
Default	OFF
Menu	Marker > Marker Setup > Coupled
Example	:CALCulate:MARKer:COUPle ALL :CALCulate:MARKer:COUPle? Return: ALL

3.8.3 Marker Display

3.8.3.1 Command list

Marker readout state	:DISPlay:WINDow<wnum>:ANNotation:MARKer:ALIGn[:STATe]
Only show the Active Trc Marker readout	:DISPlay:WINDow<wnum>:ANNotation:MARKer:SINGle[:STATe]
Single trace marker readout of X-axis position	:DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:X
Single trace marker readout of Y-axis position	:DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:Y
X-axis position of marker readout	:DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:X
Y-axis position of marker readout	:DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:Y
Marker value accuracy mode	:DISPlay:WINDow<wnum>:ANNotation:MARKer:DECimal:PLACes:AUTO

Stimulus value decimal places of marker	:DISPlay:WINDow<wnum>:ANNotation:MARKer:STIMulus:DECimal:PLACes
Response value decimal places of marker	:DISPlay:WINDow<wnum>:ANNotation:MARKer:RESPonse:DECimal:PLACes

3.8.3.2 Marker readout state

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:ALIGn[:STATe] <bool> :DISPlay:WINDow<wnum>:ANNotation:MARKer:ALIGn[:STATe]?
Instruction	Specifies whether to show or hide the Marker readout (when markers are ON) on the selected window.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	1
Menu	Marker > Marker Display > Show Readout
Example	:DISPlay:WINDow1:ANNotation:MARKer:ALIGn:STAT 0? :DISPlay:WINDow1:ANNotation:MARKer:ALIGn:STAT? Return :0

3.8.3.3 Only show the Active Trc Marker readout

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:SINGle[:STATe] <bool> :DISPlay:WINDow<wnum>:ANNotation:MARKer:SINGle[:STATe]?
Instruction	Set only shows the active trace marker readout.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	0
Menu	Marker > Marker Display > Active Trc Only
Example	:DISPlay:WINDow1:ANNotation:MARKer:SINGle:STAT 1? :DISPlay:WINDow1:ANNotation:MARKer:SINGle:STAT? Return :1

3.8.3.4 Single trace marker readout of X-axis position

Command Format	:DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:X <numeric> :DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:X?
Instruction	Sets or gets the X - axis position of the marker readout for a single trace in the window.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the X - axis position, and the parameter range: 1-10.
Return	Float
Default	10
Menu	Marker > Marker Display > Show Readout > X Div
Example	:DISPlay:CHANnel1:TRACe1:ANNotation:MARKer:POSition:X 5 :DISPlay:CHANnel1:TRACe1:ANNotation:MARKer:POSition:X? Return: 5

3.8.3.5 Single trace marker readout of Y-axis position

Command Format	:DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:Y <numeric> :DISPlay:CHANnel<cnum>TRACe<tnum>:ANNotation:MARKer:POSition:Y?
Instruction	Sets or gets the Y - axis position of the marker readout for a single trace in the window.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Y - axis position, and the parameter range: 1-10.
Return	Float
Default	10
Menu	Marker > Marker Display > Show Readout > Y Div
Example	:DISPlay:CHANnel1:TRACe1:ANNotation:MARKer:POSition:Y 7 :DISPlay:CHANnel1:TRACe1:ANNotation:MARKer:POSition:Y? Return: 7

3.8.3.6 X-axis position of marker readout

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:X <numeric> :DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:X?
Instruction	Sets or gets the window's overall marker readout at the X axis position.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <numeric>:represents the X - axis position, and the parameter range: 1-10.
Return	Float
Default	10

Menu	Marker > Marker Display > Show Readout > X Div
Example	:DISPlay:WINDow1:ANNotation:MARKer:POSition:X 6 :DISPlay:WINDow1:ANNotation:MARKer:POSition:X? Return: 6

3.8.3.7 Y-axis position of marker readout

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:Y <numeric> :DISPlay:WINDow<wnum>:ANNotation:MARKer:POSition:Y?
Instruction	Sets or gets the window's overall marker readout at the Y axis position.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <numeric>:represents the Y - axis position, and the parameter range: 1-10.
Return	Float
Default	10
Menu	Marker > Marker Display > Show Readout > Y Div
Example	:DISPlay:WINDow1:ANNotation:MARKer:POSition:Y 8 :DISPlay:WINDow1:ANNotation:MARKer:POSition:Y? Return: 6

3.8.3.8 Marker value accuracy mode

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:DECimal:PLACes:AUTO <bool> :DISPlay:WINDow<wnum>:ANNotation:MARKer:DECimal:PLACes:AUTO?
Instruction	Set or get the auto decimal state of the marker readout
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If

	not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	On
Menu	Marker > Marker Display > Decimal Places… > Auto Decimal Places
Example	:DISPlay:WINDow1:ANNotation:MARKer:DECimal:PLACes:AUTO OFF :DISPlay:WINDow1:ANNotation:MARKer:DECimal:PLACes:AUTO? Retuen:0

3.8.3.9 Stimulus value decimal places of marker

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:STIMulus:DECimal:PLACes <numeric> :DISPlay:WINDow<wnum>:ANNotation:MARKer:STIMulus:DECimal:PLACes?
Instruction	Set or get the stimulus value decimal places of marker readout.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <numeric>:represents the stimulus value decimal places, and the parameter range: 2-9.
Return	Float
Default	6
Menu	Marker > Marker Display > Decimal Places… > Marker Decimal Places Setting > Stimulus
Example	:DISPlay:WINDow1:ANNotation:MARKer:STIMulus:DECimal:PLACes 3 :DISPlay:WINDow1:ANNotation:MARKer:STIMulus:DECimal:PLACes? Retuen:3

3.8.3.10 Response value decimal places of marker

Command Format	:DISPlay:WINDow<wnum>:ANNotation:MARKer:RESPonse:DECimal:PLACes <numeric> :DISPlay:WINDow<wnum>:ANNotation:MARKer:RESPonse:DECimal:PLACes?
Instruction	Set or get the response value decimal places of marker readout.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <numeric>:represents the response value decimal places, and the parameter range: 2-6.
Return	Float
Default	6
Menu	Marker > Marker Display > Decimal Places… > Marker Decimal Places Setting > Response
Example	:DISPlay:WINDow1:ANNotation:MARKer:RESPonse:DECimal:PLACes 5 :DISPlay:WINDow1:ANNotation:MARKer:RESPonse:DECimal:PLACes 5 Retuen:5

3.8.4 Marker Function

3.8.4.1 Command List

Marker → Function	:CALCulate<cnum>[:SELected]:MARKer<mnum>:SET
Noise Marker State	:CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NOISe:STATe
N dB BW State	:CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:STATe
N dB BW reference value	:CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:THReshold
Get N dB BW	:CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:BWIDth?

result	

3.8.4.2 Marker →Function

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:SET <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:SET <type>
Instruction	This command sets the value at the position of marker 1 to 9 (Mk) and reference marker (Mk:10) to the value of the instrument setting item (Param), for the active trace of selected channel. This command sets the value at the position of marker 1 to 9 (Mk) and reference marker (Mk:10) to the value of the instrument setting item (Param), for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={STARt|STOP|CENTer|RLEVel|DELay|RMARker|SPAN|SA}
Return	None
Default	None
Menu	Marker > Marker → Function
Example	:CALCulate1:MARKer1:SET RLEVel :CALCulate1:TRACe1:MARKer1:SET STARt

3.8.4.3 Noise Marker State

Command Format	:CALCulate<cnum>:SELected:SA:MARKer<mnum>:NOISe:STATe <bool> :CALCulate<cnum>:SELected:SA:MARKer<mnum>:NOISe:STATe? :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NOISe:STATe <bool> :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NOISe:STATe?

Instruction	This command turns ON/OFF the Noise Marker function for the active trace of selected channel. This command turns ON/OFF the Noise Marker function of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10},represents the marker number. If not specified,defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Marker > Marker Function>Noise Marker
Example	:CALCulate1:SELected:SA:MARKer1:NOISe:STATe 1 :CALCulate1:SELected:SA:MARKer1:NOISe:STATe? Return 1 :CALCulate1:TRACe1:SA:MARKer1:NOISe:STATe OFF :CALCulate1:TRACe1:SA:MARKer1:NOISe:STATe? Return 0

3.8.4.4 N dB BW State

Command Format	:CALCulate<cnum>:SELected:SA:MARKer<mnum>:NDB:STATe <bool> :CALCulate<cnum>:SELected:SA:MARKer<mnum>:NDB:STATe? :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:STATe <bool> :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:STATe?
Instruction	This command turns ON/OFF the N dB Bandwidth function for the active trace of selected channel. This command turns ON/OFF the N dB Bandwidth function of selected

	trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10},represents the marker number. If not specified, defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Marker > Marker Function>N dB BW
Example	:CALCulate1:SELected:SA:MARKer1:NDB:STATe 1 :CALCulate1:SELected:SA:MARKer1:NDB:STATe? Return 1 :CALCulate1:TRACe1:SA:MARKer1:NDB:STATe 0 :CALCulate1:TRACe1:SA:MARKer1:NDB:STATe? Return 0

3.8.4.5 N dB BW reference value

Command Format	:CALCulate<cnum>:SELected:SA:MARKer<mnum>:NDB:THReshold <val> :CALCulate<cnum>:SELected:SA:MARKer<mnum>:NDB:THReshold? :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:THReshold <val> :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:THReshold?
Instruction	Set or get the N dB bandwidth reference value.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number, If not specified, defaults to 1.

	<tnum>:={[1]-256},represents the measurement trace number. If not specified, defaults to 1. <mnum>:={[1]-10},represents the marker number. If not specified, defaults to 1. <val>:= float number in the range of -500dB to 500dB.
Return	Float
Default	-3
Menu	Marker > Marker Function>N dB
Example	:CALCulate1:SELected:SA:MARKer1:NDB:THReshold -5 :CALCulate1:SELected:SA:MARKer1:NDB:THReshold? Return -5 :CALCulate1:TRACe1:SA:MARKer1:NDB:THReshold -2 :CALCulate1:TRACe1:SA:MARKer1:NDB:THReshold? Return -2

3.8.4.6 Get N dB BW result

Command Format	:CALCulate<cnum>:SELected:SA:MARKer<mnum>:NDB:BWIDth? :CALCulate<cnum>:TRACe<tnum>:SA:MARKer<mnum>:NDB:BWIDth?
Instruction	Get the result of N dB bandwidth.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number, If not specified, defaults to 1. <tnum>:={[1]-256},represents the measurement trace number. If not specified, defaults to 1. <mnum>:={[1]-10},represents the marker number. If not specified, defaults to 1.
Return	Float ,Unit Hz
Default	None
Menu	Marker > Marker Function>N dB BW
Example	:CALCulate1:TRACe1:SA:MARKer1:NDB:STATe 1

	:CALCulate1:SELected:SA:MARKer1:NDB:BWIDth? Return 2778220.80323839

3.9 Meas Commands

3.9.1 Command List

Measurement Mode	:CALCulate<cnum>:INSTrument
Measurement parameter	:CALCulate<cnum>:PARameter<tnum>:DEFine
Balance Measurement Topology	:CALCulate<cnum>:DTOPology

3.9.2 Measurement Mode

Command Format	:CALCulate<cnum>:INSTrument <type> :CALCulate<cnum>:INSTrument?
Instruction	This command sets and gets the measurement mode of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={VNA|SA|SMM|MT|CAT} VNA: Vector Network Analyzers mode SA: Spectrum Analyzer mode SMM: Scalar Mixer Measurement mode MT: Material Measurement mode
Return	Enumeration
Default	VNA
Menu	Meas > S-Params > Mode
Example	:CALCulate1:INSTrument SMM :CALCulate1:INSTrument? Return :SMM

3.9.3 Measurement parameter

Command Format	:CALCulate<cnum>:PARameter<tnum>:DEFine <string> :CALCulate<cnum>:PARameter<tnum>:DEFine?
Instruction	This command sets and gets the measurement parameter of the selected trace, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>:={S11|S21|S31|S41|S12|S22|S32|S42|S13|S23|S33|S43|S14|S24|S34|S44|A|B|C|D|R1|R2|R3|R4} The <string>parameter ranges as follows: • For S-parameters: <meas>="S<XY>", X=1 to 4,Y=1 to 4; • For ratioed measurements: <meas>="b_N/a_N,N" or <meas>="b_N/a_N_N",N=1 to 4;For example: b1/a1,1 (this means B,1/R1,1) • For non-ratioed measurements: <meas>= Any receiver followed by a comma and the port number. For example: A,1 • For Balanced Measurements: <meas>="S_{abxy}" single port balance measurement: "S_{abxy}"=Sdd11|Scd11|Sdc11|Scc11 single-ended - balanced measurement: "S_{abxy}"=Sdd11|Scd11|Sdc11|Scc11|Ssd21|Ssc21|Sds12|Scs12|Sss22|ImBal|Sds21/Scs21|Ssd12/Ssc12 balance - balance measurement: "S_{abxy}"=Sdd11|Sdd21|Sdd12|Sdd22|Scd11|Scd21|Scd12|Scd22|Sdc11|Sdc21|Sdc12|Sdc22|Scc11|Scc21|Scc12|Scc22|ImBal1|ImBal2|Sdd21/Scc21 Single-single-balance measurement "S_{abxy}"=Sss11|Sss21|Sss12|Sss22|Sds31|Scs31|Sds32|Scs32|Ssd13

	|Ssd23|Ssc13|Ssc23|Sdd33|Scd33|Sdc33|Scc33|ImBal1|ImBal2|ImBal3|ImBal|Sds31/Scs31|Sds32/Scs32
Return	String
Default	S11
Menu	Meas > S-Params/Balanced/Receiver/Wave/Ratio
Example	Set S measurement :CALCulate1:PARameter1:DEFine S12 Set balance measurement :CALCulate1:PARameter1:DEFine Sdd11 Set receiver measurement :CALCulate1:PARameter1:DEFine "A,1" :CALCulate1:PARameter1:DEFine "R1,1" Set wave measurement :CALCulate1:PARameter1:DEFine "a1,2" Set Ratio measurement :CALCulate1:PARameter1:DEFine "b2/a1,1" Query measurement :CALCulate1:PARameter1:DEFine? Return: S12

3.9.4 Balance Measurement Topology

Command Format	:CALCulate<cnum>:DTOPology <TopologyType>,<PortTopologyList> :CALCulate<cnum>:DTOPology?
Instruction	This command sets and gets the device type for the balanced measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <TopologyType>: B: Balance (2 Ports)

	SB: Single – Balance (3 Ports) SSB: Single – Single – Balance (4 Ports) BB: Balance – Balance (4 Ports) <PortTopologyList>: Integers represent the ports as the port numbers, expressing the ports in the device topology in order.
Return	String
Default	B,1,2
Menu	Meas > Balanced > Topology...
Example	:CALCulate1:DTOPology SB,1,2,3 :CALCulate1:DTOPology? Return: SB,1,2,3

3.10 Power Commands

3.10.1 Power

3.10.1.1 Commands List

RF Output State	:OUTPut[:STATe]
Power Level	:SOURce<cnum>:POWer[:LEVel][:IMMediate][:AMPLitude]
Power Start	:SOURce<cnum>:POWer:STARt
Power Stop	:SOURce<cnum>:POWer:STOP

3.10.1.2 RF Output State

Command Format	:OUTPut[:STATe] <bool> :OUTPut[:STATe]?
Instruction	This command turns on/off the stimulus signal output. Measurement cannot be made until the stimulus signal output is turned ON.
Parameter Type	<bool>:= ON|OFF|1|0

Return	Boolean
Default	ON
Menu	Power > RF Power
Example	:OUTPut 0 :OUTPut? Return: 0

3.10.1.3 Power Level

Command Format	:SOURce<cnum>:POWer[:LEVel][:IMMediate][:AMPLitude] <numeric> :SOURce<cnum>:POWer[:LEVel][:IMMediate][:AMPLitude]?
Instruction	This command sets/gets the power level of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the power level.
Return	Float, unit: dBm
Default	0
Menu	Power > Power > Power Level
Example	:SOURce1:POWer -5 :SOURce1:POWer? Return: -5

3.10.1.4 Power Start

Command Format	:SOURce<cnum>:POWer:STARt <numeric> :SOURce<cnum>:POWer:STARt?
Instruction	This command sets/gets the start value of the sweep range for the power sweep for channels 1 to 200.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the start power level.
Return	Float, unit: dBm
Default	-10
Menu	Power > Port Power > Start Power
Example	:SOURce1:POWer:STARt 5 :SOURce1:POWer:STARt? Return: 5

3.10.1.5 Power Stop

Command Format	:SOURce<cnum>:POWer:STOP <numeric> :SOURce<cnum>:POWer:STOP?
Instruction	This command sets/gets the stop value of the sweep range for the power sweep for channels 1 to 200.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the stop power level.
Return	Float, unit: dBm
Default	0
Menu	Power > Port Power > Stop Power
Example	:SOURce1:POWer:STOP -5 :SOURce1:POWer:STOP? Return: -5

3.10.2 Port Power

3.10.2.1 Command List

Power Level Couple State	:SOURce<cnum>:POWer:PORT:COUPle
Power Level of	:SOURce<cnum>:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude]

3.10.2.2 Power Level Couple State

Command Format	:SOURce<cnum>:POWer:PORT:COUPle <bool> :SOURce<cnum>:POWer:PORT:COUPle?
Instruction	This command sets/gets whether to output the same power level for each port of channels 1 to 200.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Power > Port Power > Coupling
Example	:SOURce1:POWer:PORT:COUPle OFF :SOURce1:POWer:PORT:COUPle? Return: 0

3.10.2.3 Power Level of Port

Command Format	:SOURce<cnum>:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude] <numeric> :SOURce<cnum>:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude]?
Instruction	This command sets/gets the power level value of the selected channel and port.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the power level value.
Return	Data array
Default	0
Menu	Power > Port Power > Power Level
Example	:SOURce1:POWer:PORT1 -5 :SOURce1:POWer:PORT1? Return: -5

3.10.3 Leveling & Offsets

3.10.3.1 Command List

Power Slope State	:SOURce<cnum>:POWer[:LEVel]:SLOPe:STATe
Power Slope	:SOURce<cnum>:POWer[:LEVel]:SLOPe[:DATA]
State of Power Limit	:SYSTem:POWer<pnum>:LIMit:STATe
Power Limit Value	:SYSTem:POWer<pnum>:LIMit

3.10.3.2 Power Slope State

Command Format	:SOURce<cnum>:POWer[:LEVel]:SLOPe:STATe <bool> :SOURce<cnum>:POWer[:LEVel]:SLOPe:STATe?
Instruction	This command turns ON/OFF or gets the status of the power slope feature, for the selected channel. This command corrects the attenuation of simple power level proportional to the frequency (attenuation due to cables etc).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	OFF
Menu	Power > Leveling&Offsets > Slope Enable
Example	:SOURce1:POWer:SLOPe:STATe ON :SOURce1:POWer:SLOPe:STATe? Return: 1

3.10.3.3 Power Slope

Command Format	:SOURce<cnum>:POWer[:LEVel]:SLOPe[:DATA] <numeric> :SOURce<cnum>:POWer[:LEVel]:SLOPe[:DATA]?
Instruction	This command sets/gets the correction value of the power slope feature of channels 1 to 200.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the correction value, and the parameter range: -2dB~2dB.
Return	Float, unit: dB
Default	0
Menu	Power > Leveling&Offsets > Slope
Example	:SOURce1:POWer:SLOPe -1 :SOURce1:POWer:SLOPe? Return: -1

3.10.3.4 State of Power Limit

Command Format	:SYSTem:POWer<pnum>:LIMit:STATe <bool> :SYSTem:POWer<pnum>:LIMit:STATe?
Instruction	This command enables or disables the power limit for the specified port.

Parameter Type	<pnum>:={[1]-4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Power > Leveling&Offsets > Limit Enable
Example	:SYSTem:POWer1:LIMit:STATe ON :SYSTem:POWer1:LIMit:STATe? Return: 1

3.10.3.5 Power Limit Value

Command Format	:SYSTem:POWer<pnum>:LIMit <numeric> :SYSTem:POWer<pnum>:LIMit?
Instruction	This command sets and gets the power limit value for the specified port.
Parameter Type	<pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the power limit value, and the parameter range: -1000~1000dB.
Return	Float, unit: dB
Default	0
Menu	Power > Leveling&Offsets > Limit
Example	:SYSTem:POWer1:LIMit 10 :SYSTem:POWer1:LIMit? Return: 10

3.11 SaveRecall Commands

3.11.1 Recall

3.11.1.1 Command List

Recall the .cal file	:MMEMory:LOAD:CORRection
Recall the .csa file	:MMEMory:LOAD:CSARchive
Recall the specified file	:MMEMory:LOAD[:STATe]

3.11.1.2 Recall the .cal file

Command Format	:MMEMory:LOAD:CORRection <string>
Instruction	Recall the specified calibration file
Parameter Type	<string>: represents the specified calibration file, and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Recall > Recall Cal…
Example	:MMEMory:LOAD:CORRection "local/test.cal"

3.11.1.3 Recall the .csa file

Command Format	:MMEMory:LOAD:CSARchive <string>
Instruction	Recall the specified state and calibration file.
Parameter Type	<string>: represents the specified state and calibration file, and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Recall > Recall State+Cal…
Example	:MMEMory:LOAD "local/test.csa"

3.11.1.4 Recall the specified file

Command Format	:MMEMory:LOAD[:STATe] <string>
Instruction	Recall the specified file.
Parameter Type	<string>: represents the specified file, and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Recall > File Browser…
Example	:MMEMory:LOAD "local/test.sta" :MMEMory:LOAD "local/test.csa" :MMEMory:LOAD "local/test.cal"

3.11.2 Save State

3.11.2.1 Command List

Save the .csa file	:MMEMory:STORe:CSARchive
Save the specified file	:MMEMory:STORE[:STATe]

3.11.2.2 Save the .csa file

Command Format	:MMEMory:STORe:CSARchive <string>
Instruction	Stores the instrument state and calibration data(.csa)
Parameter Type	<string>: represents the instrument state and calibration data(.csa), and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Save State > Save State As…
Example	:MMEMory:STORe:CSARchive "local/test.csa"

3.11.2.3 Save the specified file

Command Format	:MMEMory:STORE[:STATe] <string>
Instruction	Stores the specified file (.sta, .cal,.csa).
Parameter Type	<string>: represents the specified file (.sta, .cal,.csa), and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Save Other > Savel Cal… Save Recall > Save State > Save State As…
Example	:MMEMory:STORE "local/test.cal" :MMEMory:STORE "local/test.csa" :MMEMory:STORE "local/test.sta"

3.11.3 Recall Data

3.11.3.1 Command List

Recall data using CSV file	:MMEMory:LOAD:CSV <string>
Recall data using SNP file	:MMEMory:LOAD:SNP <string>
Recall CSV files onto specific trace	:MMEMory:LOAD:CSV:TRACe<tnum> <string>
Recall SNP files onto specific trace	:MMEMory:LOAD:SNP:TRACe<tnum> <string>
Interpolation state	:MMEMory:LOAD:DATA:INTerpolate[:STATe]

3.11.3.2 Recall data using CSV file

Command Format	:MMEMory:LOAD:CSV <string>
Instruction	Recall CSV file into the current channel.
Parameter Type	<string>represents the file name.
Return	None

Default	None
Menu	Save Recall > Recall Data > Recall Data
Example	:MMEMory:LOAD:CSV "local/ trace3.csv"

3.11.3.3 Recall data using SNP file

Command Format	:MMEMory:LOAD:SNP <string>
Instruction	Recall SNP file into the current channel.
Parameter Type	<string>represents the file name.
Return	None
Default	None
Menu	Save Recall > Recall Data > Recall Data
Example	:MMEMory:LOAD:SNP "local/01.s2p"

3.11.3.4 Recall CSV files onto specific trace

Command Format	:MMEMory:LOAD:CSV:TRACe<tnum> <string>
Instruction	Recall CSV file to specific trace lines.
Parameter Type	<tnum>indicates the selected trace. <string>represents the file name.
Return	None
Default	None
Menu	Save Recall > Recall Data > Recall Data
Example	:MMEMory:LOAD:CSV:TRACe2 "local/trace3.csv"

3.11.3.5 Recall SNP files onto specific trace

Command Format	:MMEMory:LOAD:SNP:TRACe<tnum> <string>
Instruction	Recall SNP file to specific trace lines.
Parameter Type	<tnum>indicates the selected trace. <string>represents the file name.
Return	None
Default	None
Menu	Save Recall > Recall Data > Recall Data
Example	:MMEMory:LOAD:SNP:TRACe2 "local/01.s2p"

3.11.3.6 Interpolation state

Command Format	:MMEMory:LOAD:DATA:INTerpolate[:STATe] <bool> :MMEMory:LOAD:DATA:INTerpolate[:STATe]?
Instruction	Set whether the file call function performs interpolation.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	ON
Menu	Save Recall > Recall Data > Interpolation
Example	:MMEMory:LOAD:DATA:INTerpolate OFF :MMEMory:LOAD:DATA:INTerpolate:STATe? Return 0

3.11.4 Save Data

3.11.4.1 Command List

Set or get CSV format	:MMEMory:STORe:CSV:FORMat
Save the selected trace data	:MMEMory:STORe:CSV [:DATA]
Save data based on trace number	:MMEMory:STORe:CSV:TRACes[:DATA]
Query SNP data	:CALCulate<cnum>[:MEASure]:DATA:SNP?<num>
Query SNP data for S-parameter	:CALCulate<cnum>[:MEASure]:DATA:SNP:PORTs
Save SNP data	:CALCulate<cnum>[:MEASure]:DATA:SNP:PORTs:SAVE

3.11.4.2 Set or get CSV format

Command Format	:MMEMory:STORe:CSV:FORMat <type> :MMEMory:STORe:CSV:FORMat?
Instruction	This command is used to set/retrieve the data format and save the measurement data of the working channel to a CSV format file. Note that the corresponding SNP command changes MA to linear amplitude and DB to logarithmic amplitude.
Parameter Type	<type>:={AUTO|MA|DB|RI|DISPlayed} "AUTO": Automatically specifies the data format based on the display "format of the activity trace. "MA": Specify the data format "linear amplitude>angle". "DB": Specify the data format "Logarithmic amplitude>Angle". "RI": Specify the data format "real part>imaginary part". "DISPlayed": Save data according to the current data format.
Return	String
Default	AUTO
Menu	Save Recall > Save Data > CSV Format
Example	:MMEMory:STORe:CSV:FORMat MA :MMEMory:STORe:CSV:FORMat? Return: MA

3.11.4.3 Save the selected trace data

Command Format	:MMEMory:STORe:CSV [:DATA] <string>
Instruction	Save the selected trace data.
Parameter Type	<string>represents the file name.
Return	None
Default	None
Menu	Save Recall > Save Data > Save Trc Data…
Example	:MMEMory:STORe:CSV "local/tmp.csv"

3.11.4.4 Save data based on trace number

Command Format	:MMEMory:STORe:CSV:TRACes[:DATA] <string1>,<string2>
Instruction	Save data based on trace number.
Parameter Type	<string1>represents a list of trace numbers <string2>represents the file path
Return	None
Default	None
Menu	Save Recall > Save Data > Save Multi Trc…
Example	:MMEMory:STORe:CSV:TRACes "2,3","local/tmp.csv"

3.11.4.5 Query SNP data

Command Format	:CALCulate<cnum>[:MEASure]:DATA:SNP?<num>
Instruction	Query SNP data
Parameter Type	<cnum>Channel Number <num>, parameter range is 1-4
Return	String(The actual returned data will be affected by the data transmission format set, including ASCII/REAL32/REAL64, and the default is ASCII code)

Default	None
Menu	None
Example	:CALCulate1:MEASure:DATA:SNP? 1 Return:1.000000000000e+05,8.500000000000e+09,-2.517962752291e-01,-8.413169797246e+00,-1.795121308191e+02,-1.373235865870e+02

3.11.4.6 Query SNP data for S-parameter

Command Format	:CALCulate<cnum>[:MEASure]:DATA:SNP:PORTs?<string>
Instruction	Query SNP data. This command is only used for measuring S parameters.
Parameter Type	<cnum>, channel number <string>, port number
Return	String
Default	None
Menu	None
Example	:CALCulate1:MEASure:DATA:SNP:PORTs? "1" Return:1.000000000000e+05,8.500000000000e+09,-2.245324021131e-01,-8.419927767910e+00,-1.795215338430e+02,-1.376447999678e+02

3.11.4.7 Save SNP data

Command Format	:CALCulate<cnum>[:MEASure]:DATA:SNP:PORTs:SAVE<string1>,<string2>{,type}
Instruction	Save SNP data.
Parameter Type	<cnum>Channel Number <string1>, port number <string2>, save file name

	<type>:={AUTO|MA|DB|RI} "AUTO": Automatically specifies the data format based on the display format of the activity trace. "MA": Specify the data format "linear amplitude>angle". "DB": Specify the data format "Logarithmic amplitude>Angle". "RI": Specify the data format "real part>imaginary part".
Return	None
Default	None
Menu	Save Recall > Save Data > Save SnP
Example	:CALCulate1:DATA:SNP:PORTs:SAVE "1","local/sdh.s1p",DB

3.11.5 Save Other

3.11.5.1 Command list

Save the screen Image	:MMEMory:STORe:IMAGe
Save the .cal file	:MMEMory:STORe:CORRection
Save Fdata	:MMEMory:STORe:FDATa
Read/write file data	:MMEMory:TRANsfer
Format of SNP File	:MMEMory:STORe:SNP:FORMat
Save SNP File	:MMEMory:STORe:SNP[:DATA]
Port Saved in S1P File	:MMEMory:STORe:SNP:TYPE:S1P
Ports Saved in S2P File	:MMEMory:STORe:SNP:TYPE:S2P
Ports Saved in S3P File	:MMEMory:STORe:SNP:TYPE:S3P
Ports Saved in S4P File	:MMEMory:STORe:SNP:TYPE:S4P

3.11.5.2 Save the screen Image

Command Format	:MMEMory:STORe:IMAGe <string>

Instruction	This command saves the display image on the LCD display at the execution of the object into a file in the bitmap (extension ".bmp") or portable network graphics format (extension ".png") or JPEG file interchange format (extension ".jpg").
Parameter Type	<string>: represents the image format file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > Save Other > Screenshot…
Example	:MMEMory:STORe:IMAGe "local/test.bmp"

3.11.5.3 Save the .cal file

Command Format	:MMEMory:STORe:CORRection <string>
Instruction	Stores the calibration data(.cal)
Parameter Type	<string>: represents the calibration data(.cal), and the parameter range: less than 255 characters.
Return	None
Default	None
Menu	Save Recall > Save Other > Savel Cal…
Example	:MMEMory:STORe:CORRection "local/test.cal"

3.11.5.4 Save Fdata

Command Format	:MMEMory:STORe:FDATa <string>
Instruction	This command saves the formatted data array into a file in the CSV format (extension ".csv"), for the active trace of the active channel. If a file with the same name as the specified file name exists, its contents are overwritten.
Parameter Type	<string>: represents the formatted data file(extension ".csv"), and the

	parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > Save Other > Save Trc Data…
Example	:MMEMory:STORe:FDATa "local/test.csv"

3.11.5.5 Read/write file data

Command Format	:MMEMory:TRANsfer <string>,<block> :MMEMory:TRANsfer?
Instruction	Data written on/read out from the file
Parameter Type	<string>: represents the file name on the built-in storage device. <block>: represents the contents of the file.(Block data format example: #212ABCDEF123456, the data starts with #, the following 2 specifies the number of bytes is two digits, 12 specifies the number of bytes of the following data, ABCDEF123456 represents 12-bit data.)
Return	Return the data from the specified file location
Default	None
Menu	None
Example	:MMEMory:TRANsfer? "local/test.csv" Return: #592939"# Channel\s1" "#\sTrace 2" Frequency,Formatted Data,Formatted Data 1.000000000000e+05, -7.710605710955e-02,2.403043541994e-01 2.912437500000e+06,

3.11.5.6 Format of SNP File

Command Format	:MMEMory:STORe:SNP:FORMat <type> :MMEMory:STORe:SNP:FORMat?
Instruction	This command sets/gets the data format for saving measurement data for the active channel into a file in the touchstone format.

Parameter Type	<type>:={AUTO|MA|DB|RI} "AUTO":Specifies data format automatically according to the display format of the active trace. "MA":Specifies data format "log magnitude > angle". "DB":Specifies data format "linear magnitude > angle". "RI":Specifies data format "real part > imaginary part".
Return	String
Default	AUTO
Menu	Save Recall > Save Other > SnP Format
Example	:MMEMory:STORe:SNP:FORMat MA :MMEMory:STORe:SNP:FORMat? Return: MA

3.11.5.7 Save SNP File

Command Format	:MMEMory:STORe:SNP[:DATA] <string>
Instruction	Saves the measurement data for the active channel into a file in the touchstone format. You need to specify a file format and file type before saving a file. The extension differs depending on file types. .s1p:When specifying one port .s2p:When specifying two port .s3p:When specifying three port .s4p:When specifying four port
Parameter Type	<string>: represents the SNP file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > Save Other > Save SnP
Example	:MMEMory:STORe:SNP:TYPE:S2P 2,3 :MMEMory:STORe:SNP "local/test.s2p"

3.11.5.8 Port Saved in S1P File

Command Format	:MMEMory:STORe:SNP:TYPE:S1P <pnum> :MMEMory:STORe:SNP:TYPE:S1P?
Instruction	This command sets/gets the specified port to the file type (1 port) when saving measurement data for the active channel into a file in the touchstone format.
Parameter Type	<pnum>:={1~4},specifies the measurement port number.
Return	Integer
Default	1
Menu	None
Example	:MMEMory:STORe:SNP:TYPE:S1P 2 :MMEMory:STORe:SNP:TYPE:S1P? Return: 2

3.11.5.9 Ports Saved in S2P File

Command Format	:MMEMory:STORe:SNP:TYPE:S2P <pnum1>,<pnum2> :MMEMory:STORe:SNP:TYPE:S2P?
Instruction	This command sets/gets the specified port to the file type (2 port) when saving measurement data for the active channel into a file in the touchstone format.
Parameter Type	<pnum1>:={1~4}, specifies the measurement port number. <pnum2>:={1~4}, specifies another port number.
Return	Data array
Default	1,2
Menu	None
Example	:MMEMory:STORe:SNP:TYPE:S2P 2,3 :MMEMory:STORe:SNP:TYPE:S2P?

	Return: 2,3

3.11.5.10 Ports Saved in S3P File

Command Format	:MMEMory:STORe:SNP:TYPE:S3P <pnum1>,<pnum2>,<pnum3> :MMEMory:STORe:SNP:TYPE:S3P?
Instruction	This command sets/gets the specified port to the file type (3 port) when saving measurement data for the active channel into a file in the touchstone format.
Parameter Type	<pnum1>:={1~4}, specifies the measurement port number. <pnum2>:={1~4}, specifies the measurement port number. <pnum3>:={1~4}, specifies the measurement port number. Ports cannot be duplicated.
Return	Data array
Default	1,2,3
Menu	None
Example	:MMEMory:STORe:SNP:TYPE:S3P 2,3,4 :MMEMory:STORe:SNP:TYPE:S3P? Return: 2,3,4

3.11.5.11 Ports Saved in S4P File

Command Format	:MMEMory:STORe:SNP:TYPE:S4P <pnum1>,<pnum2>,<pnum3>,<pnum4> :MMEMory:STORe:SNP:TYPE:S4P?
Instruction	This command sets/gets the specified port to the file type (4 port) when saving measurement data for the active channel into a file in the touchstone format.
Parameter Type	<pnum1>:={1~4}, specifies the measurement port number. <pnum2>:={1~4}, specifies the measurement port number. <pnum3>:={1~4}, specifies the measurement port number.

	<pnum4>:={1~4}, specifies the measurement port number. Ports cannot be duplicated.
Return	Data array
Default	1,2,3,4
Menu	None
Example	:MMEMory:STORe:SNP:TYPE:S4P 1,2,3,4 :MMEMory:STORe:SNP:TYPE:S4P? Return: 1,2,3,4

3.11.6 File Browser

3.11.6.1 Command List

Enter a folder directory	:MMEMory:CDIRectory
Makes a folder	:MMEMory:MDIRectory
Delete a folder	:MMEMory:RDIRectory
Rename a file	:MMEMory:MOVE
Query the directory file list	:MMEMory:CATalog[:<type>]? [<string>]
Copy File	:MMEMory:COPY
Delete File	:MMEMory:DELete
The save date of a File	:MMEMory:DATE?
The save time of a File	:MMEMory:TIME?

3.11.6.2 Enter a folder directory

Command Format	:MMEMory:CDIRectory <string> :MMEMory:CDIRectory?
Instruction	Toggle or query the current working directory. The default directory is "/", and the common working directory is "/local". If the new folder is at a different level than the default, use a slash (/) before the folder name and enclose in quotes., such as "/local/NewFolder"

Parameter Type	<string>: represents the current working directory, and the parameter range: 255 characters or less.
Return	String
Default	"/"
Menu	Save Recall > File Browser
Example	1. If no external USB flash drive is inserted, only the common /local directory is available. The following is an example to enter a folder in the local directory: :MMEMory:CDIRectory "/local/NewFolder" :MMEMory:CDIRectory? Return: "/local/NewFolder" 2. When an external USB flash drive is inserted, the working directory contains "/local" and "/U-disk0". The following is an example of going to a folder in the USB flash drive directory: :MMEMory:CDIRectory "/U-disk0/NewFolder" :MMEMory:CDIRectory? Return :"/ U-disk0/NewFolder"

3.11.6.3 Makes a folder

Command Format	:MMEMory:MDIRectory <string>
Instruction	Make a folder.
Parameter Type	<string>: represents the file directory, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > File Browser
Example	1. In the local directory, create a folder named "123". MMEMory:MDIRectory "/local/123" 2. When inserting a U disk, create a folder named "456" in the U disk directory.

	MMEMory:MDIRectory "/U-disk0/456"

3.11.6.4 Delete a folder

Command Format	:MMEMory:RDIRectory <string>
Instruction	Delete the specified folder
Parameter Type	<string>: represents the file directory, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > File Browser
Example	1. In the local directory, delete a folder named "123". :MMEMory: RDIRectory "/local/123" 2. When inserting a U disk, delete a folder named "456" in the U disk directory. :MMEMory:RDIRectory "/U-disk0/456".

3.11.6.5 Rename a file

Command Format	:MMEMory:MOVE <string1>,<string2>
Instruction	Renames <string1> to <string2>. File extensions must be specified.
Parameter Type	<string1>,<string2>: represents the file name, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Save Recall > File Browser > Rename
Example	1. In the local directory, rename the "12.csv" file to "34.csv". :MMEMory:MOVE "/local/123.csv",/local/789.csv" 2. When inserting an U disk, rename the "11.csv" file to "22.csv" in the

	directory of the U disk. :MMEMory:MOVE "/U-disk0/11.csv",/local/22.csv"

3.11.6.6 Query the directory file list

Command Format	:MMEMory:CATalog[:<type>]? [<string>]
Instruction	Query the files in the specified directory. If the file type and folder name are not specified, all files in the current directory are queried.
Parameter Type	<type>: string, the type of files to list.Choose from: STATe|STA - Instrument states (.sta) CORRection|CAL- Calibration Data (.cal) CSARchive|CSA - Instrument state and calibration data (.csa) CSV - Instrument state (.csv) DIRectory – Instrument foler list. <string>: String - Any existing folder name. The parameter range: 255 characters or less.
Return	String
Default	None
Menu	Save Recall > File Browser
Example	1. Query all files in the local root directory. :MMEMory:CATalog? "/local" 2. Query all files in the root directory of a U disk. :MMEMory:CATalog? "/U-disk0" 3. Query all ".CSV" files in the "Test" folder of the local directory :MMEMory:CATalog:CSV? "/local/Test"

3.11.6.7 Copy File

Command Format	:MMEMory:COPY <string1>,<string2>
Instruction	This command copies a file. If the specified copy source file does not exist, an error occurs when executed and the object is ignored. Notice

	that, if a file with the same name as the specified copy destination file name exists, its contents are overwritten. The source file and copy destination file is seperated by comma.
Parameter Type	<string1>,<string2>: represents the file name, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	None
Example	:MMEMory:COPY "local/test1.csv","local/test2.csv"

3.11.6.8 Delete File

Command Format	:MMEMory:DELete <string>
Instruction	This command deletes an existing file or directory (folder). If the specified file or directory does not exist, an error occurs when executed and the object is ignored.
Parameter Type	<string>: represents the file name, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	None
Example	:MMEMory:DELete "local/test1.csv"

3.11.6.9 The save date of a File

Command Format	:MMEMory:DATE? <string>
Instruction	Returns the (year, month, day) that the specified file was last saved.
Parameter Type	<string>: represents the specified file, and the parameter range: 255 characters or less.
Return	Integer

Default	None
Menu	Save Recall > File Browser
Example	Query the save date of the file "123.csv" in the local directory. :MMEM:DATE? "/local/123.csv" Return : 2022,11,5

3.11.6.10 The save time of a File

Command Format	:MMEMory:TIME? <string>
Instruction	Returns the (hour, minute,second) that the specified file was last saved.
Parameter Type	<string>: represents the specified file, and the parameter range: 255 characters or less.
Return	Integer
Default	None
Menu	Save Recall > File Browser
Example	Query the save time of the file "123.csv" in the local directory. :MMEM:TIME? "/local/123.csv" Return : 15,55,34

3.12 Scale Commands

3.12.1 Scale

3.12.1.1 Command List

Auto Scale	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:AUTO
Auto Scale All	:DISPlay:WINDow<wnum>:Y:AUTO
Scale Per Division	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:PDIVision
Scale Reference Level	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RLEVel
Scale Reference	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RPOSition

Position	

3.12.1.2 Auto Scale

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:AUTO
Instruction	This command executes the auto scale function, for the selected trace (Tr) of selected channel (Ch). The Auto Scale function automatically adjusts the value of the reference division line and the scale per division to display the trace appropriately.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	Scale > Auto Scale
Example	:DISPlay:WINDow1:TRACe2:Y:AUTO

3.12.1.3 Auto Scale All

Command Format	:DISPlay:WINDow<wnum>:Y:AUTO
Instruction	Scales all of the traces to fit in the same window. This is equivalent to "Auto Scale All" from the front panel. Auto scale behaves differently when scale coupling is enabled. How it behaves depends on the scale coupling method.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Scale > Auto Scale All
Example	:DISPlay:WINDow1:Y:AUTO

3.12.1.4 Scale Per Division

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:PDIVision <numeric> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:PDIVision?
Instruction	For the selected trace of selected channel, when the data format is not the Smith chart format or the polar format, sets the scale per division. When the data format is the Smith chart format or the polar format, sets the full scale value (the value of the outermost circumference).
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the scale per division, float, unit varies depending on the data format. Log magnitude: dB (decibel) Phase, Expanded phase or Positive phase: (degree) Group delay: s (second) Others: No unit
Return	Float
Default	Varies depending the data format. Log magnitude: 10 Phase, Expanded phase or Positive phase: 90 Group delay: 1E-8 Smith chart or Polar or SWR: 1 Linear magnitude: 0.1 Real or Imaginary: 0.2
Menu	Scale > Scale
Example	:DISPlay:WINDow1:TRACe1:Y:PDIVision 10 :DISPlay:WINDow1:TRACe1:Y:PDIVision? Return: 10

3.12.1.5 Scale Reference Level

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RLEVel <numeric> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RLEVel?
Instruction	This command sets/gets the value of the reference division line, for the selected trace of selected channel.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the scale reference level, float, unit varies depending on the data format. Log magnitude: dB (decibel) Phase, Expanded phase or Positive phase: (degree) Group delay: s (second) Others: No unit
Return	Float
Default	0
Menu	Scale > Reference Level
Example	:DISPlay:WINDow1:TRACe1:Y:RLEVel 5 :DISPlay:WINDow1:TRACe1:Y:RLEVel? Return: 5

3.12.1.6 Scale Reference Position

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RPOSition <numeric> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:RPOSition?
Instruction	This command specifies the position of a reference division line with its number (an integer assigned starting from 0 from the lowest division), for the selected trace of selected channel.

Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the scale reference position, and the parameter range: 0 to the number of divisions.
Return	Integer
Default	5
Menu	Scale > Reference Position
Example	:DISPlay:WINDow1:TRACe1:Y:RPOSition 6 :DISPlay:WINDow1:TRACe1:Y:RPOSition? Return: 6

3.12.2 Electrical Delay

3.12.2.1 Command List

Electrical Delay Time	:CALCulate<cnum>:TRACe<tnum>:CORRection:EDELay:TIME
Electrical Delay Distance	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:DISTance
Electrical Delay Distance Units	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:UNIT
Velocity Factor	:SENSe<cnum>:CORRection:RVELocity:COAX
Madia	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:MEDium
Cuttoff Freq of Waveguide	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:WGCutoff

3.12.2.2 Electrical Delay Time

Command Format	:CALCulate<cnum>[:SELected]:CORRection:EDELay:TIME <numeric> :CALCulate<cnum>[:SELected]:CORRection:EDELay:TIME? :CALCulate<cnum>:TRACe<tnum>:CORRection:EDELay:TIME <numeric>

	:CALCulate<cnum>:TRACe<tnum>:CORRection:EDELay:TIME?
Instruction	This command sets/gets the electrical delay time of the active trace of channels 1 to 200. This command sets/gets the electrical delay time of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the electrical delay time, and the parameter range: -10~10.
Return	Float, unit s(second)
Default	0
Menu	Scale > Electrical Delay > Delay Time
Example	:CALCulate1:CORRection:EDELay:TIME 1 :CALCulate1:CORRection:EDELay:TIME? Return: 1 :CALCulate1:TRACe1:CORRection:EDELay:TIME 2 :CALCulate1:TRACe1:CORRection:EDELay:TIME? Return: 2

3.12.2.3 Electrical Delay Distance

Command Format	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:DISTance <numeric> :CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:DISTance ?
Instruction	This command sets/gets the electrical delay distance of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not

	specified, <tnum> defaults to 1. <numeric>:represents the electrical delay distance.
Return	Float, unit meter, feet or inch
Default	0
Menu	Scale > Electrical Delay > Delay Distance
Example	:CALCulate1:MEASure1:CORRection:EDELay:DISTance 1 :CALCulate1:MEASure1:CORRection:EDELay:DISTance? Return: 1

3.12.2.4 Electrical Delay Distance Units

Command Format	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:UNIT <type> :CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:UNIT?
Instruction	This command sets/gets the electrical delay distance units of selected trace for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>: {METer|FEET|INCH}
Return	METer|FEET|INCH
Default	METer
Menu	Scale > Electrical Delay > Distance Units
Example	:CALCulate1:MEASure1:CORRection:EDELay:UNIT FEET :CALCulate1:MEASure1:CORRection:EDELay:UNIT? Return: FEET

3.12.2.5 Velocity Factor

Command Format	:SENSe<cnum>:CORRection:RVELocity:COAX <numeric> :SENSe<cnum>:CORRection:RVELocity:COAX?
Instruction	This command sets/gets the velocity factor, for selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the velocity factor e, and the parameter range: 0~1.
Return	Float
Default	1
Menu	Scale > Electrical Delay > Velocity Factor
Example	:SENSe1:CORRection:RVELocity:COAX 0.5 :SENSe1:CORRection:RVELocity:COAX? Return: 0.5

3.12.2.6 Madia

Command Format	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:MEDium <type> :CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:MEDium ?
Instruction	Sets the media used when calculating the electrical delay.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={COAX|WAVE}.
Return	String
Default	COAX
Menu	Scale > Electrical Delay > Media
Example	:CALCulate1:MEASure1:CORRection:EDELay:MEDium WAVE

	:CALCulate1:MEASure1:CORRection:EDELay:MEDium? Return: WAVE

3.12.2.7 Cuttoff Freq of Waveguide

Command Format	:CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:WGCutoff <numeric> :CALCulate<cnum>:MEASure<tnum>:CORRection:EDELay:WGCutoff ?
Instruction	Sets the waveguide cutoff frequency used when the electrical delay media is set to WAVEguide.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:Waveguide cutoff frequency used with the electrical delay calculation.
Return	Float, unit:Hz
Default	45MHz
Menu	Scale > Electrical Delay > Wavegd Cutoff
Example	:CALCulate1:MEASure1:CORRection:EDELay:WGCutoff 100e3 :CALCulate1:MEASure1:CORRection:EDELay:WGCutoff? Return: 100000

3.12.3 Constants

3.12.3.1 Command list

System Impedance	:SENSe:CORRection:IMPedance[:INPut][:MAGNitude]
Phase Offset	:CALCulate<cnum>:TRACe<tnum>:CORRection:OFFSet:PHASe
Magnitude Offset	:CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude

Magnitude Slope	:CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude:SLOPe

3.12.3.2 System Impedance

Command Format	:SENSe:CORRection:IMPedance[:INPut][:MAGNitude] <numeric> :SENSe:CORRection:IMPedance[:INPut][:MAGNitude]?
Instruction	This command sets/gets the system characteristic impedance (Z0) value.
Parameter Type	<numeric>:represents the system characteristic impedance (Z0) value, and the parameter range: 0~1000.
Return	Float
Default	50
Menu	Scale > Constants > System Z0
Example	:SENSe:CORRection:IMPedance 75 :SENSe:CORRection:IMPedance? Return: 75

3.12.3.3 Phase Offset

Command Format	:CALCulate<cnum>[:SELected]:CORRection:OFFSet:PHASe <numeric> :CALCulate<cnum>[:SELected]:CORRection:OFFSet:PHASe? :CALCulate<cnum>:TRACe<tnum>:CORRection:OFFSet:PHASe <numeric> :CALCulate<cnum>:TRACe<tnum>:CORRection:OFFSet:PHASe?
Instruction	This command sets/gets the phase offset of the active trace of selected channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<numeric>:represents the phase offset, and the parameter range: -360 ~ 360.
Return	Float unit (radian)
Default	0
Menu	Scale > Constants > Phase offset
Example	:CALCulate1:CORRection:OFFSet:PHASe 25 :CALCulate1:CORRection:OFFSet:PHASe? Return: 25 :CALCulate1:TRACe1:CORRection:OFFSet:PHASe 90 :CALCulate1:TRACe1:CORRection:OFFSet:PHASe? Return: 90

3.12.3.4 Magnitude Offset

Command Format	:CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude <numeric> :CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude?
Instruction	This command sets/gets the magnitude offset of the active trace of selected channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the magnitude offset, and the parameter range: -1000 ~ 1000
Return	Float unit dB
Default	0
Menu	Scale > Constants > Mag offset
Example	:CALCulate1:MEASure1:OFFSet:MAGNitude 90 :CALCulate1:MEASure1:OFFSet:MAGNitude? Return: 90

3.12.3.5 Magnitude Slope

Command Format	:CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude:SLOPe <numeric> :CALCulate<cnum>:MEASure<tnum>:OFFSet:MAGNitude:SLOPe?
Instruction	This command sets/gets the magnitude slope of the active trace of selected channel
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the magnitude slope, and the parameter range: -1000 ~ 1000.
Return	Float unit dB/GHz
Default	0
Menu	Scale > Constants > Mag Slope
Example	:CALCulate1:MEASure1:OFFSet:MAGNitude:SLOPe 10 :CALCulate1:MEASure1:OFFSet:MAGNitude:SLOPe? Return: 10

3.12.4 Advanced

3.12.4.1 Command List

Scale Divisions	:DISPlay:WINDow<wnum>:Y[:SCALe]:DIVisions
Scale Type	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:TYPE
Logarithmic scale Y-axis maximum value	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MAXimize
Logarithmic scale Y-axis minimum value	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MINimize

3.12.4.2 Scale Divisions

Command Format	:DISPlay:WINDow<wnum>:Y[:SCALe]:DIVisions <numeric> :DISPlay:WINDow<wnum>:Y[:SCALe]:DIVisions?
Instruction	This command sets/gets the number of division on the Y-axis.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <numeric>:represents the number of division on the Y-axis, and the parameter range: an even number from 4 to 30.
Return	Integer
Default	10
Menu	Scale > Advanced > Divisions
Example	:DISPlay:WINDow1:Y:DIVisions 4 :DISPlay:WINDow1:Y:DIVisions? Return: 4

3.12.4.3 Scale Type

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:TYPE <type> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:TYPE?
Instruction	This command sets/gets the type of scale display.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={LINear|LOG} LINear: Linear scale mode. LOG: Logarithmic scale mode.
Return	Enumeration
Default	LINear
Menu	Scale > Advanced > Scale Type

Example	:DISPlay:WINDow1:TRACe1:Y:TYPE LOG :DISPlay:WINDow1:TRACe1:Y:TYPE? Return: LOG

3.12.4.4 Logarithmic scale Y-axis maximum value

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MAXimize <numeric> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MAXimize ?
Instruction	This command sets/gets the Y-axis maximum value on a logarithmic scale.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Y-axis maximum value on a logarithmic scale, and the parameter range: integer powers of 10.
Return	Float
Default	10000
Menu	Scale > Advanced > Max Value
Example	:DISPlay:WINDow1:TRACe1:Y:LOG:MAXimize 1000 :DISPlay:WINDow1:TRACe1:Y:LOG:MAXimize? Return: 1000

3.12.4.5 Logarithmic scale Y-axis minimum value

Command Format	:DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MINimize <numeric> :DISPlay:WINDow<wnum>:TRACe<tnum>:Y[:SCALe]:LOG:MINimize?
Instruction	This command sets/gets the Y-axis minimum value on a logarithmic

	scale..
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Y-axis minimum value on a logarithmic scale, and the parameter range: integer powers of 10.
Return	Float
Default	0.01
Menu	Scale > Advanced > Min Value
Example	:DISPlay:WINDow1:TRACe1:Y:LOG:MINimize 0.1 :DISPlay:WINDow1:TRACe1:Y:LOG:MINimize? Return: 0.1

3.13 Search Commands

3.13.1 Search

3.13.1.1 Command List

Marker Search Type	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TYPE
Execute Search	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:EXECute
Add Search Domain	:CALCulate<cnum> [:SELected]:MARKer:FUNCtion:DOMain:ADD
Delete Search Domain	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain:DELete
Select Search Range Number	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:DOMain:NUMber
Search Domain Start	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STARt
Search Domain Stop	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STOP
Tracking State	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TRACking

3.13.1.2 Marker Search Type

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TYPE <type> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TYPE? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TYPE <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TYPE?
Instruction	This command selects the search type for marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This command selects the search type for marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={MAXimum|MINimum|PEAK|LPEak|RPEak|TARGet|LTARget|RTARget}
Return	Enumeration
Default	None
Menu	Search > Max Search/Min Search Search > Peak Search/Peak Right Search/Peak Left Search Search > Target Search/Target Right Search/Target Left Search
Example	:CALCulate1:MARKer1:FUNCtion:TYPE RTARget :CALCulate1:MARKer1:FUNCtion:TYPE? Return: RTAR :CALCulate1:TRACe1:MARKer1:FUNCtion:TYPE PEAK :CALCulate1:TRACe1:MARKer1:FUNCtion:TYPE? Return: PEAK

3.13.1.3 Execute Search

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:EXECute :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:EXECute
Instruction	This command immediately executes the specified search function of the active trace for the selected channel. This command immediately executes the specified search function of the selected trace, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.
Return	None
Default	None
Menu	Search > Max Search/Min Search Search > Peak Search/Peak Right Search/Peak Left Search Search > Target Search/Target Right Search/Target Left Search
Example	:CALCulate1:MARKer1:FUNCtion:TYPE MAXimum :CALCulate1:MARKer1:FUNCtion:EXECute :CALCulate1:TRACe1:MARKer1:FUNCtion:TYPE MINimum :CALCulate1:TRACe1:MARKer1:FUNCtion:EXECute

3.13.1.4 Add Search Domain

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain:ADD
Instruction	This command adds search range of search analysis for the selected marker, for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

Return	None
Default	None
Menu	Search > Domain > Add
Example	:CALCulate1:MARKer:FUNCtion:DOMain:ADD

3.13.1.5 Delete Search Domain

Command Format	:CALCulate<cnum> [:SELected]:MARKer:FUNCtion:DOMain:DELete <numeric>
Instruction	This command deletes search range of search analysis for the selected marker, for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the search range of marker, and the parameter range: 1 ~ 16.
Return	None
Default	None
Menu	Search > Domain > Delete
Example	:CALCulate1:MARKer:FUNCtion:DOMain:DELete 1

3.13.1.6 Select Search Range Number

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:DOMain:NUMber <numeric> :CALCulate<cnum> [:SELected]:MARKer<mnum>:FUNCtion:DOMain:NUMber? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:DOMain:NUMber <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:DOMain:NUMber?
Instruction	This command selects or gets search range number of search analysis

	for the selected marker, for the active trace of selected channel. This command selects or gets search range number of search analysis for the selected marker, for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the search range of marker, and the parameter range: 1 ~ 16.
Return	Integer
Default	None
Menu	Search > Domain
Example	:CALCulate1:TRACe1:MARKer1:FUNCtion:DOMain:NUMber 3 :CALCulate1:TRACe1:MARKer1:FUNCtion:DOMain:NUMber? Return: 3 :CALCulate1:MARKer:FUNCtion:DOMain:NUMber 2 :CALCulate1:MARKer:FUNCtion:DOMain:NUMber? Return: 2

3.13.1.7 Search Domain Start

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain<dnum>:STARt <numeric> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain<dnum>:STARt? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STARt <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STARt?
Instruction	This command sets/gets the start value of the marker search range, for the selected channel.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <dnum>:={[1]-16}, represents the number of the marker search range. <numeric>:represents the start value of the marker search range.
Return	Float
Default	None
Menu	Search > Start
Example	:CALCulate1:MARKer:FUNCtion:DOMain2:STARt 1e9 :CALCulate1:MARKer:FUNCtion:DOMain2:STARt? Return: 1000000000 :CALCulate1:TRACe1:MARKer:FUNCtion:DOMain2:STARt 2e9 :CALCulate1:TRACe1:MARKer:FUNCtion:DOMain2:STARt? Return: 2000000000

3.13.1.8 Search Domain Stop

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain<dnum>:STOP <numeric> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:DOMain<dnum>:STOP? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STOP <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:DOMain<dnum>:STOP?
Instruction	This command sets/gets the stop value of the marker search range, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<dnum>:={[1]-16}, represents the number of the marker search range. <numeric>:represents the stop value of the marker search range.
Return	Float
Default	None
Menu	Search > Stop
Example	:CALCulate1:MARKer:FUNCtion:DOMain2:STOP 3e9 :CALCulate1:MARKer:FUNCtion:DOMain2:STOP? Return: 3000000000 :CALCulate1:TRACe1:MARKer:FUNCtion:DOMain2:STOP 4e9 :CALCulate1:TRACe1:MARKer:FUNCtion:DOMain2:STOP? Return: 4000000000

3.13.1.9 Tracking State

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TRACking <bool> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TRACking? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TRACking <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TRACking?
Instruction	This command turns ON or OFF the tracking search capability for the specified marker of the active trace for the selected channel. This command turns ON or OFF the tracking search capability for the specified marker of the selected trace, for the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	OFF
Menu	Search > Tracking
Example	:CALCulate1:MARKer2:FUNCtion:TRACking ON :CALCulate1:MARKer2:FUNCtion:TRACking? Return: 1 :CALCulate1:TRACe1:MARKer2:FUNCtion:TRACking OFF :CALCulate1:TRACe1:MARKer2:FUNCtion:TRACking? Return: 0

3.13.2 Peak

3.13.2.1 Command List

Peak Search THReshold	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FUNCtion:PEAK:THReshold
Peak Search Excursion	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PEXCursion
Peak Search POLarity	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PPOLarity

3.13.2.2 Peak Search THReshold

Command Format	:CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FUNCtion:PEAK:THReshold <numeric> :CALCulate<cnum>:MEASure<tnum>:MARKer<mnum>:FUNCtion:PEAK:THReshold?
Instruction	This comamnd set/get the threshold of the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the threshold of the peak search, and the parameter range: -500dB~500dB.
Return	Float
Default	-100dB
Menu	Search > Peak > Threshold
Example	:CALCulate1:MEASure1:MARKer2:FUNCtion:PEAK:THReshold -20 :CALCulate1:MEASure1:MARKer2:FUNCtion:PEAK:THReshold? Return: -20

3.13.2.3 Peak Search Excursion

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:PEXCursion <numeric> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:PEXCursion? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PEXCursion <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PEXCursion?
Instruction	This command sets/gets the lower limit of peak excursion value when executing the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). Peak excursion value is the minimum value of the difference relative to the right and left adjacent measurement points. This command sets/gets the lower limit of peak excursion value when executing the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch). Peak excursion value is the minimum value of the difference relative to the right and left adjacent measurement points.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the lower limit of peak excursion value, and the parameter range: -500dB~500dB.
Return	Float
Default	3dB
Menu	Search > Peak > Excursion
Example	:CALCulate1:MARKer2:FUNCtion:PEXCursion 2 :CALCulate1:MARKer2:FUNCtion:PEXCursion? Return: 2 :CALCulate1:TRACe1:MARKer2:FUNCtion:PEXCursion 6 :CALCulate1:TRACe1:MARKer2:FUNCtion:PEXCursion? Return: 6

3.13.2.4 Peak Search POLarity

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:PPOLarity <type> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:PPOLarity? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PPOLarity <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:PPOLarity?
Instruction	This comamnd set/get the polarity of the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This comamnd set/get the polarity of the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected

	channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={POSitive|NEGative|BOTH}
Return	Enumeration
Default	POSitive
Menu	Search > Peak > Peak Polarity
Example	:CALCulate1:MARKer2:FUNCtion:PPOLarity NEGative :CALCulate1:MARKer2:FUNCtion:PPOLarity? Return: NEG :CALCulate1:TRACe1:MARKer2:FUNCtion:PPOLarity BOTH :CALCulate1:TRACe1:MARKer2:FUNCtion:PPOLarity? Return: BOTH

3.13.3 Target

3.13.3.1 Command List

Target Search Value	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TARGet
Transition Type of Target Search	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TTRansition

3.13.3.2 Target Search Value

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TARGet <numeric> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TARGet?

	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TARGet <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TARGet?
Instruction	This command sets/gets the target value to be searched with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This command sets/gets the target value to be searched with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the target value, and the parameter range: -500dB~500dB.
Return	Float
Default	0 dB
Menu	Search > Target > Target Value
Example	:CALCulate1:MARKer2:FUNCtion:TARGet 1 :CALCulate1:MARKer2:FUNCtion:TARGet? Return: 1 :CALCulate1:TRACe1:MARKer2:FUNCtion:TARGet -3 :CALCulate1:TRACe1:MARKer2:FUNCtion:TARGet? Return: -3

3.13.3.3 Transition Type of Target Search

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TTRansition <type> :CALCulate<cnum>[:SELected]:MARKer<mnum>:FUNCtion:TTRansit

	ion? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TTRansition <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:FUNCtion:TTRansition?
Instruction	This command selects the transition type of the target search, for marker 1 to 9 (Mk) and reference marker (Mk:10) of the active trace of selected channel (Ch). This command selects the transition type of the target search, for marker 1 to 9 (Mk) and reference marker (Mk:10) of the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={POSitive|NEGative|BOTH}
Return	Enumeration
Default	POSitive
Menu	Search > Target > Transition
Example	:CALCulate1:MARKer2:FUNCtion:TTRansition NEGative :CALCulate1:MARKer2:FUNCtion:TTRansition? Return: NEG :CALCulate1:TRACe1:MARKer2:FUNCtion:TTRansition POSitive :CALCulate1:TRACe1:MARKer2:FUNCtion:TTRansition? Return: POS

3.13.4 Multi Peak & Target

3.13.4.1 Command List

Search Type of Multi	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TYPE

Peak&Target Search	
Multi Peak Search THReshold	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:THReshold
Multi Peak Search Pexcurion	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PEXCursion
Multi Peak Search POLarity	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PPOLarity
Multi Target Search Value	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TARGet
Transition Type of Multi Target Search	:CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TTRansition

3.13.4.2 Search Type of Multi Peak&Target Search

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TYPE <type> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TYPE? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TYPE <type> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TYPE?
Instruction	This command sets/gets the search type of the multi search of the active trace of selected channel (Ch). This command sets/gets the search type of the multi search of the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={PEAK|TARGet|OFF}
Return	Enumeration
Default	None
Menu	None
Example	:CALCulate1:MARKer:FUNCtion:MULTi:TYPE PEAK

	:CALCulate1:MARKer:FUNCtion:MULTi:TYPE? Return: PEAK :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TYPE TARGet :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TYPE? Return: TARG

3.13.4.3 Multi Peak Search THReshold

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:THReshold <numeric> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:THReshold ? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:THReshold <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:THReshold?
Instruction	This comamnd set/get the threshold of the multi peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of active channel (Ch). This comamnd set/get the threshold of the multi peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the threshold of the multi peak search, and the parameter range: -500dB~500dB.
Return	Float
Default	-100 dB
Menu	Search > Multi Peak&Target > Peak Threshold
Example	:CALCulate1:MARKer:FUNCtion:MULTi:THReshold -20 :CALCulate1:MARKer:FUNCtion:MULTi:THReshold?

	Return: -20 :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:THReshold -30 :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:THReshold? Return: -30

3.13.4.4 Multi Peak Search Pexcurion

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:PEXCursion <numeric> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:PEXCursion? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PEXCursion <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PEXCursion?
Instruction	This command sets/gets the lower limit of multi peak excursion value when executing the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). Peak excursion value is the minimum value of the difference relative to the right and left adjacent measurement points. This command sets/gets the lower limit of multi peak excursion value when executing the peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch). Peak excursion value is the minimum value of the difference relative to the right and left adjacent measurement points.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the lower limit of multi peak excursion value, and the parameter range: -500dB~500dB.
Return	Float
Default	3 dB
Menu	Search > Multi Peak&Target > Peak Excursion

Example	:CALCulate1:MARKer:FUNCtion:MULTi:PEXCursion 2 :CALCulate1:MARKer:FUNCtion:MULTi:PEXCursion? Return: 2 :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:PEXCursion 6 :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:PEXCursion? Return: 6

3.13.4.5 Multi Peak Search POLarity

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:PPOLarity <type> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:PPOLarity ? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PPOLarity <type> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:PPOLarity?
Instruction	This comamnd set/get the polarity of the multi peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This comamnd set/get the polarity of the multi peak search with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={POSitive|NEGative|BOTH}
Return	Enumeration
Default	POSitive
Menu	Search > Multi Peak&Target > Peak Polarity
Example	:CALCulate1:MARKer:FUNCtion:MULTi:PPOLarity BOTH :CALCulate1:MARKer:FUNCtion:MULTi:PPOLarity?

	Return: BOTH :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:PPOLarity NEGative :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:PPOLarity? Return: NEG

3.13.4.6 Multi Target Search Value

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TARGet <numeric> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TARGet? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TARGet <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TARGet?
Instruction	This command sets/gets the multi target value to be searched with marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This command sets/gets the multi target value to be searched with marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the target value, and the parameter range: -500dB~500dB.
Return	Float
Default	0 dB
Menu	Search > Multi Peak&Target > Target Value
Example	:CALCulate1:MARKer:FUNCtion:MULTi:TARGet -10 :CALCulate1:MARKer:FUNCtion:MULTi:TARGet? Return: -10 :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TARGet -5

	:CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TARGet? Return: -5

3.13.4.7 Transition Type of Multi Target Search

Command Format	:CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TTRansition <type> :CALCulate<cnum>[:SELected]:MARKer:FUNCtion:MULTi:TTRansition ? :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TTRansition <type> :CALCulate<cnum>:TRACe<tnum>:MARKer:FUNCtion:MULTi:TTRansition ?
Instruction	This command selects the transition type of the multi target search, for marker 1 to 9 (Mk) and reference marker (Mk:10) of the active trace of selected channel (Ch). This command selects the transition type of the multi target search, for marker 1 to 9 (Mk) and reference marker (Mk:10) of the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={POSitive|NEGative|BOTH}
Return	Enumeration
Default	POSitive
Menu	Search > Multi Peak&Target > Transition
Example	:CALCulate1:MARKer:FUNCtion:MULTi:TTRansition NEGative :CALCulate1:MARKer:FUNCtion:MULTi:TTRansition? Return: NEG :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TTRansition POSitive :CALCulate1:TRACe1:MARKer:FUNCtion:MULTi:TTRansition? Return: POS

3.13.5 Bandwidth

3.13.5.1 Command List

Bandwidth Search Result State of Marker	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth[:STATe]
Bandwidth Search BW Ref To	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:REF
Bandwidth Threshold of Marker	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:THReshold
Bandwidth Search Result of Marker	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:DATA?

3.13.5.2 Bandwidth Search Result State of Marker

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth[:STATe] <bool> :CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth[:STATe]? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth[:STATe]?
Instruction	This command turns ON/OFF the bandwidth search result display, for the active trace of selected channel; This command turns ON/OFF the bandwidth search result display, for the selected trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.

	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Search > Bandwidth > Bandwidth Search
Example	:CALCulate1:TRACe1:MARKer1 ON :CALCulate1:MARKer1:BWIDth ON :CALCulate1:MARKer1:BWIDth? Return: 1 :CALCulate1:TRACe1:MARKer:BWIDth OFF :CALCulate1:TRACe1:MARKer:BWIDth? Return: 0

3.13.5.3 Bandwidth Search BW Ref To

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth:REF <type> :CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth:REF? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:REF <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:REF?
Instruction	Sets or gets the bandwidth reference type for the bandwidth search of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={MARKer|PEAK}
Return	Enumeration
Default	PEAK

Menu	Search > Bandwidth > BW Ref To
Example	:CALCulate1:SELected:MARKer1:BWIDth:REF MARKer :CALCulate1:SELected:MARKer1:BWIDth:REF? Return :MARK :CALCulate1:TRACe1:MARKer1:BWIDth:REF PEAK :CALCulate1:TRACe1:MARKer1:BWIDth:REF? Return :PEAK

3.13.5.4 Bandwidth Threshold of Marker

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth:THReshold <numeric> :CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth:THReshold ? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:THReshold <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:THReshold?
Instruction	This command sets/gets the bandwidth definition value (the value to define the pass-band of the filter) of marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the bandwidth definition value, and the parameter range: -500~500.
Return	Float
Default	-3
Menu	Search > Bandwidth > BW Level

Example	:CALCulate1:MARKer1:BWIDth:THReshold -3.5 :CALCulate1:MARKer1:BWIDth:THReshold? Return: -3.5 :CALCulate1:TRACe1:MARKer1:BWIDth:THReshold -6 :CALCulate1:TRACe1:MARKer1:BWIDth:THReshold? Return: -6

3.13.5.5 Bandwidth Search Result of Marker

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:BWIDth:DATA? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:BWIDth:DATA?
Instruction	This command reads the bandwidth search result of marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.
Return	Indicates 4-element array data (bandwidth search result). Data(0) :The bandwidth. Data(1) :Center point frequency of the 2 cutoff frequency points. Data(2) :The Q value. Data(3) :Insertion loss The index of the array starts from 0. The bandwidth search enable switch must to be turned on before query the search result.
Default	None
Menu	None
Example	:CALCulate1:MEASure1:MARKer3 ON :CALCulate1:MARKer:BWIDth ON

	:CALCulate1:MARKer3:BWIDth:DATA? :CALCulate1:TRACe1:MARKer3:BWIDth:DATA? Return: 254357919.225087,4162270498.174748,16.363833, -13.946911

3.13.6 Notch

3.13.6.1 Command List

Notch Search State	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh[:STATe]
Notch Search Notch Ref To	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCH:REF
Notch Search Level	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh:THReshold
Get Notch Search Data	:CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh:DATA?

3.13.6.2 Notch Search State

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCh[:STATe] <bool> :CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCh[:STATe]? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh[:STATe] <bool> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh[:STATe]?
Instruction	This command turns ON/OFF the notch search result display, for the active trace of selected channel (Ch). This command turns ON/OFF the notch search result display, for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.

	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Search > Notch > Notch Search
Example	:CALCulate1:MARKer2:NOTCh ON :CALCulate1:MARKer2:NOTCh? Return: 1 :CALCulate1:TRACe1:MARKer2:NOTCh OFF :CALCulate1:TRACe1:MARKer2:NOTCh? Return: 0

3.13.6.3 Notch Search Notch Ref To

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCH:REF <type> :CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCH:REF? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCH:REF <type> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCH:REF?
Instruction	Sets or gets the notch reference type for the selected channel and trace notch search.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <type>:={MARKer|PEAK}
Return	Enumeration
Default	PEAK
Menu	Search > Notch > Notch Ref To

Example	:CALCulate1:SELected:MARKer1:NOTCH:REF MARKer :CALCulate1:SELected:MARKer1:NOTCH:REF? Return :MARK :CALCulate1:TRACe1:MARKer1:NOTCH:REF PEAK :CALCulate1:TRACe1:MARKer1:NOTCH:REF? Return :PEAK

3.13.6.4 Notch Search Level

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCh:THReshold <numeric> :CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCh:THReshold ? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh:THReshold <numeric> :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh:THReshold?
Instruction	This command sets/gets the notch definition value of marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This command sets/gets the notch definition value of marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <numeric>:represents the notch definition value, and the parameter range: -500dB~500dB.
Return	Float
Default	-3 dB

Menu	Search > Notch > Notch Level
Example	:CALCulate1:MARKer2:NOTCh:THReshold -6 :CALCulate1:MARKer2:NOTCh:THReshold? Return: -6 :CALCulate1:TRACe1:MARKer2:NOTCh:THReshold -3 :CALCulate1:TRACe1:MARKer2:NOTCh:THReshold? Return: -3

3.13.6.5 Get Notch Search Data

Command Format	:CALCulate<cnum>[:SELected]:MARKer<mnum>:NOTCh:DATA? :CALCulate<cnum>:TRACe<tnum>:MARKer<mnum>:NOTCh:DATA?
Instruction	This command reads the notch search result of marker 1 to 9 (Mk) and reference marker (Mk:10), for the active trace of selected channel (Ch). This command reads the notch search result of marker 1 to 9 (Mk) and reference marker (Mk:10), for the selected trace of selected channel (Ch).
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1.
Return	Indicates 4-element array data (notch bandwidth search result). Data(0) :The bandwidth. Data(1) :Center point frequency of the 2 cutoff frequency points. Data(2) :The Q value. Data(3) :Insertion loss The index of the array starts from 0.
Default	None
Menu	None

Example	:CALCulate1:MARKer2:NOTCh:DATA? :CALCulate1:TRACe1:MARKer2:NOTCh:DATA?

3.14 Service Commands

3.14.1 Command List

Get Active Trace	:SERVice:CHANnel<cnum>:TRACe:ACTive?
Get Active Channel	:SERVice:CHANnel:ACTive?
Get Upper Limit of Numbers of Channels	:SERVice:CHANnel:COUNt?
Get Upper Limit of Numbers of Traces	:SERVice:CHANnel:TRACe:COUNt?
Get Upper Limit of Numbers of Ports	:SERVice:PORT:COUNt?
Maximum Frequency	:SERVice:SWEep:FREQency:MAXimum?
Minimum Frequency	:SERVice:SWEep:FREQency:MINimum?
Get Upper Limit of Numbers of Sweep Points	:SERVice:SWEep:POINts?
Clear Log Data	:SERVice:LOGGing:CLEar
System error information	:SYSTem:ERRor?
10MHz Reference Oscillator	:SENSe:ROSCillator:SOURce?

3.14.2 Get Active Trace

Command Format	:SERVice:CHANnel<cnum>:TRACe:ACTive?
Instruction	This command reads the active trace number of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	Integer
Default	1
Menu	None
Example	:SERVice:CHANnel1:TRACe:ACTive?

3.14.3 Get Active Channel

Command Format	:SERVice:CHANnel:ACTive?
Instruction	This command reads the active channel number.
Parameter Type	None
Return	Integer
Default	1
Menu	None
Example	:DISPlay:WINDow2:ACTivate :SERVice:CHANnel:ACTive? Return: 2

3.14.4 Get Upper Limit of Numbers of Channels

Command Format	:SERVice:CHANnel:COUNt?
Instruction	This reads the upper limit of the number of channels.
Parameter Type	None
Return	Integer
Default	None
Menu	None
Example	:SERVice:CHANnel:COUNt? Return: 256

3.14.5 Get Upper Limit of Numbers of Traces

Command Format	:SERVice:CHANnel:TRACe:COUNt?
Instruction	This reads the upper limit of the number of traces.
Parameter Type	None
Return	Integer

Default	None
Menu	None
Example	:SERVice:CHANnel:TRACe:COUNt? Return: 256

3.14.6 Get Upper Limit of Numbers of Ports

Command Format	:SERVice:PORT:COUNt?
Instruction	This reads the upper limit of the number of ports.
Parameter Type	None
Return	Integer
Default	None
Menu	None
Example	:SERVice:PORT:COUNt?

3.14.7 Maximum Frequency

Command Format	:SERVice:SWEep:FREQency:MAXimum?
Instruction	This reads the upper limit of measurement frequency.
Parameter Type	None
Return	Float, unit: Hz
Default	Maximum frequency of the analyzer
Menu	None
Example	:SERVice:SWEep:FREQency:MAXimum?

3.14.8 Minimum Frequency

Command Format	:SERVice:SWEep:FREQency:MINimum?

Instruction	This reads the lower limit of measurement frequency.
Parameter Type	None
Return	Float, unit: Hz
Default	9 kHz
Menu	None
Example	:SERVice:SWEep:FREQency:MINimum?

3.14.9 Get Upper Limit of Numbers of Sweep Points

Command Format	:SERVice:SWEep:POINts?
Instruction	This reads the upper limit of the number of sweep points.
Parameter Type	None
Return	Integer
Default	20001
Menu	None
Example	:SERVice:SWEep:POINts?

3.14.10 Clear Log Data

Command Format	:SERVice:LOGGing:CLEar
Instruction	This command clears the log data of the instrument.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:SERVice:LOGGing:CLEar

3.14.11 System error information

Command Format	:SYSTem:ERRor?
Instruction	Query the system error information,and return the Error number and the Error message(a character string with double quotation marks("))
Parameter Type	None
Return	array
Default	None
Menu	None
Example	:SYSTem:ERRor? Return: -101, "Invalid character"

3.14.12 10MHz Reference Oscillator

Command Format	:SENSe:ROSCillator:SOURce?
Instruction	This command gets whether apply 10 MHz signal to the Reference Oscillato connector.
Parameter Type	None
Return	String
Default	None "EXT":10 MHz signal already applied to the reference oscillator connector. "INT":10 MHz signal not applied to the reference oscillator connector.
Menu	The ninth parameter at the bottom of the screen.
Example	:SENSe1:ROSCillator:SOURce? Return: INT

3.15 Sweep Commands

3.15.1 Command List

Sweep Point	:SENSe<cnum>:SWEep:POINts
Sweep Type	:SENSe<cnum>:SWEep:TYPE
Auto Sweep	:SENSe<cnum>:SWEep:TIME:AUTO
Sweep Time	:SENSe<cnum>:SWEep:TIME[:DATA]
Sweep Delay	:SENSe<cnum>:SWEep:DELay
Individual Segment State Control	:SENSe<cnum>:SEGMent:LIST:CONTrol:STATe
Display Type of the Graph Horizontal Axis	:DISPlay:WINDow<wnum>:X:SPACing
Save Segment Sweep Table	:MMEMory:STORE:SEGMent
Load Segment Sweep Table	:MMEMory:LOAD:SEGMent
IF Bandwidth Per Port	:SENSe<cnum>:SEGMent:LIST:BWIDth:PORT:STATe
IFBW of Each Segment	:SENSe<cnum>:SEGMent:LIST:BWIDth:PORT<pnum>[:RESolution]
State of Each Segment	:SENSe<cnum>:SEGMent:LIST:CONTrol:DATA
Individual Power Control	:SENSe<cnum>:SEGMent:LIST:POWer:PORT:STATe
Power Level of Each Segment	:SENSe<cnum>:SEGMent:LIST:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude]
Total Sweep Points of Segment Sweep	:SENSe<cnum>:SEGMent:SWEep:POINts?
Total Sweep Time of Segment Sweep	:SENSe<cnum>:SEGMent:SWEep:TIME[:DATA]?
Segment Sweep Table	:SENSe<cnum>:SEGMent:DATA <Data>

3.15.2 Sweep Point

Command Format	:SENSe<cnum>:SWEep:POINts <numeric> :SENSe<cnum>:SWEep:POINts?
Instruction	This command sets/gets the number of measurement points of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the sweep points.
Return	Integer
Default	201
Menu	Sweep > Sweep Points
Example	:SENSe1:SWEep:POINts 251 :SENSe1:SWEep:POINts? Return: 251

3.15.3 Sweep Type

Command Format	:SENSe<cnum>:SWEep:TYPE <type> :SENSe<cnum>:SWEep:TYPE?
Instruction	This command sets/gets the sweep type of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={LINear|LOGarithmic|SEGMent|POWer|CW} "LINear":Sets the sweep type to the linear sweep. "LOGarithmic":Sets the sweep type to the log sweep. "SEGMent":Sets the sweep type to the segment sweep. "POWer":Sets the sweep type to the power sweep "CW":Sets the sweep type to the constant power sweep
Return	Enumeration
Default	LINear

Menu	Sweep > Sweep Type
Example	:SENSe1:SWEep:TYPE SEGMent :SENSe1:SWEep:TYPE? Return: SEGM

3.15.4 Auto Sweep

Command Format	:SENSe<cnum>:SWEep:TIME:AUTO <bool> :SENSe<cnum>:SWEep:TIME:AUTO?
Instruction	This command sets/gets whether to automatically set the sweep time of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Sweep > Sweep Mode
Example	:SENSe1:SWEep:TIME:AUTO 0 :SENSe1:SWEep:TIME:AUTO? Return: 0

3.15.5 Sweep Time

Command Format	:SENSe<cnum>:SWEep:TIME[:DATA] <numeric> :SENSe<cnum>:SWEep:TIME[:DATA]?
Instruction	This command sets/gets the sweep time of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the sweep time.
Return	Float, unit: s (second)

Default	None
Menu	Sweep > Sweep Time
Example	:SENSe1:SWEep:TIME 2 :SENSe1:SWEep:TIME? Return: 2

3.15.6 Sweep Delay

Command Format	:SENSe<cnum>:SWEep:DELay <numeric> :SENSe<cnum>:SWEep:DELay?
Instruction	This command sets/gets the sweep delay time of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the sweep delay time.
Return	Float, unit: s (second)
Default	0
Menu	Sweep > Sweep Delay
Example	:SENSe1:SWEep:DELay 1 :SENSe1:SWEep:DELay? Return: 1

3.15.7 Individual Segment State Control

Command Format	:SENSe<cnum>:SEGMent:LIST:CONTrol:STATe <bool> :SENSe<cnum>:SEGMent:LIST:CONTrol:STATe?
Instruction	This command turns ON/OFF or gets the individual segment state control in the segment sweep table.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0

Return	Boolean
Default	1
Menu	None
Example	:SENSe1:SEGMent:LIST:CONTrol:STATe 0 :SENSe1:SEGMent:LIST:CONTrol:STATe? Return: 0

3.15.8 Display Type of the Graph Horizontal Axis

Command Format	:DISPlay:WINDow<wnum>:X:SPACing <type> :DISPlay:WINDow<wnum>:X:SPACing?
Instruction	This command selects the display type of the graph horizontal axis of selected channel for segment sweep.
Parameter Type	<wnum>:={[1]-36}, represents the measurement window number. If not specified, <cnum> defaults to 1. <type>:={LINear|OBASe} "LINear":Specifies the frequency base (linear frequency axis with the minimum frequency at the left edge and the maximum frequency at the right edge). "OBASe" :Specifies the order base (axis in which the measurement point numbers are positioned evenly in the order of measurement).
Return	Enumeration
Default	LINear
Menu	Sweep > Segment Table > Segment Table... > X-Axis Point Spacing
Example	:DISPlay:WINDow1:X:SPACing OBASe :DISPlay:WINDow1:X:SPACing? Return: OBAS

3.15.9 Save Segment Sweep Table

Command Format	:MMEMory:STORE:SEGMent <string>
Instruction	This command saves the segment sweep table of the active channel into a file in the CSV format (extension ".csv").If a file with the same name as the specified file name exists, its contents are overwritten.
Parameter Type	<string>: represents the CSV file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Sweep > Segment Table > Segment Table… > Save Table
Example	:MMEMory:STORE:SEGMent "local/test.csv"

3.15.10 Load Segment Sweep Table

Command Format	:MMEMory:LOAD:SEGMent <string>
Instruction	This command recalls the specified segment sweep table file, as the segment sweep table of the active channel.
Parameter Type	<string>: represents the CSV file, and the parameter range: 255 characters or less.
Return	None
Default	None
Menu	Sweep > Segment Table > Segment Table… > Load Table
Example	:MMEMory:LOAD:SEGMent "local/test.csv"

3.15.11 IF Bandwidth Per Port

Command Format	:SENSe<cnum>:SEGMent:LIST:BWIDth:PORT:STATe <bool> :SENSe<cnum>:SEGMent:LIST:BWIDth:PORT:STATe?
Instruction	This command turns ON/OFF or gets the status of IFBW Per Port control in the segment sweep table.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > Segment Table > Segment Table Setting > IF Bandwidth Per Port
Example	:SENSe1:SEGMent:LIST:BWIDth:PORT:STATe 1 :SENSe1:SEGMent:LIST:BWIDth:PORT:STATe? Return: 1

3.15.12 IFBW of Each Segment

Command Format	:SENSe<cnum>:SEGMent:LIST:BWIDth:PORT<pnum>[:RESolution] <value1>,<value2>,...,<valueN> :SENSe<cnum>:SEGMent:LIST:BWIDth:PORT<pnum>[:RESolution]?
Instruction	This command sets/gets the IFBW of each segment for the selected port and channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <value1>,<value2>,...,<valueN>: represents the array data of NOP (number of total segment numbers). Where n is an integer between 1 and NOP.
Return	Data array
Default	10 kHz
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SENSe1:SEGMent:LIST:BWIDth:PORT1:RESolution 10e3,20e3,30e3 :SENSe1:SEGMent:LIST:BWIDth:PORT1? Return: 1.000000000000e+04,2.000000000000e+04,3.000000000000e+04

3.15.13 State of Each Segment

Command Format	:SENSe<cnum>:SEGMent:LIST:CONTrol:DATA <value1>,<value2>,...,<valueN> :SENSe<cnum>:SEGMent:LIST:CONTrol:DATA?
Instruction	This command sets/gets the state of each segment in the segment sweep table of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <value1>,<value2>,...,<valueN>: represents t the array data of NOP (number of total segment numbers). Where n is an integer between 1 and NOP.
Return	Data array
Default	None
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SENSe1:SEGMent:LIST:CONTrol:DATA 1,1,0 :SENSe1:SEGMent:LIST:CONTrol:DATA? Return: 1,1,0

3.15.14 Individual Power Control

Command Format	:SENSe<cnum>:SEGMent:LIST:POWer:PORT:STATe <bool> :SENSe<cnum>:SEGMent:LIST:POWer:PORT:STATe?
Instruction	This command turns ON/OFF the individual power control in the segment sweep table. This command overrides the coupled port power control.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean

Default	0
Menu	Sweep > Segment Table > Segment Table Setting > Power Level
Example	:SENSe1:SEGMent:LIST:POWer:PORT:STATe 1 :SENSe1:SEGMent:LIST:POWer:PORT:STATe? Return: 1

3.15.15 Power Level of Each Segment

Command Format	:SENSe<cnum>:SEGMent:LIST:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude] <value1>,<value2>,...,<valueN> :SENSe<cnum>:SEGMent:LIST:POWer:PORT<pnum>[:LEVel][:IMMediate][:AMPLitude]?
Instruction	This command sets/gets the power level of each segment for the selected port and channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <value1>,<value2>,...,<valueN>: represents the array data of NOP (number of total segment numbers). Where n is an integer between 1 and NOP, and the parameter range: -55~20dB.
Return	Data array
Default	0
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SOURce1:POWer:PORT:COUPle 1 :SENSe1:SEGMent:DATA 5,0,0,1,0,0,3,9000,1e+06,21,-5,1e+09,2e+09,61,1,3e+09,4e+09,101,-5 :SENSe1:SEGMent:LIST:POWer:PORT1 -10,-20,-15 :SENSe1:SEGMent:LIST:POWer:PORT1? Return: -1.000000000000e+01,-2.000000000000e+01,-1.500000000000e+01 :SOURce1:POWer:PORT:COUPle 0

	:SENSe1:SEGMent:LIST:POWer:PORT2? Return: -5.000000000000e+00,1.000000000000e+00,-5.000000000000e+00

3.15.16 Total Sweep Points of Segment Sweep

Command Format	:SENSe<cnum>:SEGMent:SWEep:POINts?
Instruction	This command reads the total number of the measurement points of all segments, for the segment sweep table of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	Integer
Default	21
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SENSe1:SEGMent:DATA 5,0,0,0,0,0,3,9000,1e+06,21,1e+09,2e+09,61,3e+09,4e+09,101 :SENSe1:SEGMent:SWEep:POINts? Return: 183

3.15.17 Total Sweep Time of Segment Sweep

Command Format	:SENSe<cnum>:SEGMent:SWEep:TIME[:DATA]?
Instruction	This command reads the total sweep time (including sweep delay time) of all segments, for the segment sweep table of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	Float, unit: s (second)
Default	None
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SENSe1:SEGMent:DATA

	5,0,0,0,0,1,3,9000,1e+06,21,1,1e+09,2e+09,61,5,3e+09,4e+09,101,10 :SENSe1:SEGMent:SWEep:TIME? Return: 16

3.15.18 Segment Sweep Table

Command Format	:SENSe<cnum>:SEGMent:DATA <Data> :SENSe<cnum>:SEGMent:DATA?
Instruction	This command creates/gets the segment sweep table of selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <Data>: represents the array data arranged in the following order (for the segment sweep table); where N is the number of segments (specified with <segm>) and n is an integer between 1 and N. Data = {<buf>,<stim>,<ifbw>,<pow>,<del>,<swp>,<time>,<segm>,<star 1>,<stop 1>,<nop 1>,<ifbw 1>,<pow 1>,<del 1>,<swp 1>,<time 1>,... , <star n>,<stop n>,<nop n>,<ifbw n>,<pow n>,<del n>,<swp n>,<time n>,.... , <star N>,<stop N>,<nop N>,<ifbw N>,<pow N>,<del N>,<swp N>,<time N>} Each parameter in the above array data is detailed below: <buf>:Always specify 5. <stim>:Stimulus setting mode 0:Specifies with start/stop values 1:Specifies with center/span values <ifbw>:ON/OFF of the IF bandwidth setting for each segment 0:OFF, 1:ON <pow>:ON/OFF of the power setting for each segment 0:OFF, 1:ON <del>:ON/OFF of the sweep delay time setting for each segment

	0:OFF, 1:ON <time>:ON/OFF of the sweep time setting for each segment 0:OFF, 1:ON <segm>:Number of segments Specify an integer ranging 1 to 201. <star n>:Start value/center value of the n-th segment <stop n>:Stop value/span value of the n-th segment <nop n>:Number of measurement points of the n-th segment <ifbw n>:IF bandwidth of the n-th segment Not necessary when the IF bandwidth setting for each segment is OFF (<ifbw>:0). <pow n>:Power of the n-th segment Not necessary when the power setting for each segment is OFF (<pow>:0). <del n>:Sweep delay time of the n-th segment Not necessary when the sweep delay time setting for each segment is OFF (<del>:0). <time n> Sweep time of the n-th segment Not necessary when the sweep time setting for each segment is OFF (<time>:0).
Return	Data array
Default	5,0,0,0,0,0,1,100000,1e6,21
Menu	Sweep > Segment Table > Segment Table Setting
Example	:SENSe1:SEGMent:DATA 5,0,0,0,0,0,2,9000,1e+06,21,1e+09,2e+09,61 :SENSe1:SEGMent:DATA? Return: 5.000000000000e+00,0.000000000000e+00,0.000000000000e+00,0.000000000000e+00,0.000000000000e+00,0.000000000000e+00,2.000000000000e+00,9.000000000000e+03,1.000000000000e+06,2.100000000000e+01,1.000000000000e+09,2.000000000000e+09,6.100000000000e+01

3.16 System Commands

3.16.1 System

3.16.1.1 Command List

Display System Date and Time	:DISPlay:CLOCk
System Date	:SYSTem:DATE
System Time	:SYSTem:TIME
Set the graphic format	:HCOPy:SDUMp:DATA:FORMat
The print color for output	:HCOPy:IMAGe
Set the area of screenshot	:HCOPy:AREA
Saves the screen image to a file	:HCOPy:FILE
Get the arbitrary block of image	:HCOPy:SDUMp:DATA[:IMMediate]?
Reboot the VNA	:SYSTem:REBoot
Shut down the VNA	:SYSTem:SHUTdown

3.16.1.2 Display System Date and Time

Command Format	:DISPlay:CLOCk <bool> :DISPlay:CLOCk?
Instruction	This command turns ON/OFF the clock display in the instrument status bar (at the right bottom of the LCD display).
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	1
Menu	System > Date&Time > Display Date Time
Example	:DISPlay:CLOCk OFF :DISPlay:CLOCk? Return: 0

3.16.1.3 System Date

Command Format	:SYSTem:DATE <string> :SYSTem:DATE?

Instruction	This command sets/gets the date of the clock built in the VNA instrument.
Parameter Type	<string>: represents 3-element array data (date of the built-in clock). Data(0) Sets year(1980~2099). Data(1) Sets month(1~12). Data(2) Sets day(1~31). The index of the array starts from 0.
Return	Data array
Default	None
Menu	System > Date & Time
Example	:SYSTem:DATE 2020,1,1 :SYSTem:DATE? Return: 2020,01,01

3.16.1.4 System Time

Command Format	:SYSTem:TIME <string> :SYSTem:TIME?
Instruction	This command sets/gets the time of the clock built in the VNA instrument.
Parameter Type	<string>: represents 3-element array data (date of the built-in clock). Data(0) Sets hour(0~23). Data(1) Sets minute(0~59). Data(2) Sets second(0~59). The index of the array starts from 0.
Return	Data array
Default	None
Menu	System > Date & Time
Example	:SYSTem:TIME 10,30,40 :SYSTem:TIME?

	Return: 10,30,40

3.16.1.5 Set the graphic format

Command Format	:HCOPy:SDUMp:DATA:FORMat <type> :HCOPy:SDUMp:DATA:FORMat?
Instruction	Sets the graphic format for screenshot.
Parameter Type	<type>:={JPG|BMP|PNG}
Return	enumerate
Default	PNG
Menu	None
Example	:HCOPy:SDUMp:DATA:FORMat BMP :HCOPy:SDUMp:DATA:FORMat? Return :BMP

3.16.1.6 The print color for output

Command Format	:HCOPy:IMAGe <type> :HCOPy:IMAGe?
Instruction	sets/gets the print color for output (to the printer).
Parameter Type	<type>:={NORMal|INVert} "NORMal": Specifies printing in close color to the display color. "INVert": Specifies printing in the inverted color of the display color.
Return	enumerate
Default	NORMal
Menu	System > System > Screenshot Settings…
Example	:HCOPy:IMAGe INVert :HCOPy:IMAGe? Return :INV

3.16.1.7 Set the area of screenshot

Command Format	:HCOPy:AREA <type> :HCOPy:AREA?
Instruction	Set or get the area of the screenshot.
Parameter Type	<type>:={ALL|WINDow} ALL: Capture the entire screen. WINDow: Only capture waveform window area (excluding toolbar, status bar and menu bar)
Return	enumerate
Default	WINDow
Menu	System > System > Screenshot Settings…
Example	:HCOPy:AREA ALL :HCOPy:AREA? Return :ALL

3.16.1.8 Saves the screen image to a file

Command Format	:HCOPy:FILE <string> :HCOPy:FILE?
Instruction	Save the screen display as a local file or an external storage device file. The file name must specify an extension.
Parameter Type	<string>: represents the file name, and the parameter range: less than 256 characters. Use one of the following suffixes: .bmp - not recommended due to large file size .jpg - not recommended due to poor quality .png - recommended
Return	None

Default	None
Menu	None
Example	1.Save the screen display to the local local as a ".jpg" file. :HCOPy:FILE "/local/myfile.jpg" Save the screen display to an external USB flash drive as a.png file. :HCOPy:FILE "/U-disk0/myfile.png"

3.16.1.9 Get the arbitrary block of image

Command Format	:HCOPy:SDUMp:DATA[:IMMediate]?
Instruction	Returns the display image in a definite-length arbitrary binary block. The format of the data is PNG by default.
Parameter Type	None
Return	A definite-length arbitrary binary block
Default	None
Menu	None
Example	:HCOPy:SDUMp:DATA:IMMediate? Return: #73072054BM6\E0.\00\00\00\00\006\00\00\00(\00\00\00\00\05\00\00\s\03\00\00\01\00\18\00\00\00\00\00\00\E0.\00\FE\11\00\00\EB\10\00\00\00\00\00\00\00\00\00\E8\E9\E9\E8\...

3.16.1.10 Reboot the VNA

Command Format	:SYSTem:REBoot
Instruction	Restart the VNA.
Parameter Type	None

Return	None
Default	None
Menu	System > Power >Reboot
Example	:SYSTem:REBoot

3.16.1.11 Shut down the VNA

Command Format	:SYSTem:SHUTdown
Instruction	Shut down the VNA.
Parameter Type	None
Return	None
Default	None
Menu	System > Power >Shut down
Example	:SYSTem:SHUTdown

3.16.2 I/O Setting

3.16.2.1 Command List

State of DHCP	:SYSTem:COMMunicate:LAN:TYPE
IP Address	:SYSTem:COMMunicate:LAN:IPADdress
Subnet Mask	:SYSTem:COMMunicate:LAN:SMASk
Gateway	:SYSTem:COMMunicate:LAN:GATeway
GPIB Address	:SYSTem:COMMunicate:GPIB:ADDRess

3.16.2.2 State of DHCP

Command Format	:SYSTem:COMMunicate:LAN:TYPE <type> :SYSTem:COMMunicate:LAN:TYPE?

Instruction	Toggles the IP assignment setting between static (manual) and DHCP (dynamic assignment) mode. Gets IP config.
Parameter Type	<type>:={STATIC|DHCP}
Return	Enumeration
Default	STATIC
Menu	System > I/O Setting > LAN Status > DHCP
Example	:SYSTem:COMMunicate:LAN:TYPE DHCP :SYSTem:COMMunicate:LAN:TYPE? Return: DHCP

3.16.2.3 IP Address

Command Format	:SYSTem:COMMunicate:LAN:IPADdress <string> :SYSTem:COMMunicate:LAN:IPADdress?
Instruction	Sets a host name for the analyzer in network. Gets IP address.
Parameter Type	<string> is a string with double quotation marks and the format is "xxx.xxx.xxx.xxx". Conform to the IP Sets standard (0-255:0-255:0-255:0-255).
Return	String
Default	None
Menu	System > I/O Setting > LAN Status > IP Address
Example	:SYSTem:COMMunicate:LAN:IPADdress "10.11.13.100" :SYSTem:COMMunicate:LAN:IPADdress? Return: "10.11.13.100"

3.16.2.4 Subnet Mask

Command Format	:SYSTem:COMMunicate:LAN:SMASk <string> :SYSTem:COMMunicate:LAN:SMASk?
Instruction	Sets the subnet mask according to the PC network Settings. The subnet mask will be set automatically if the IP assignment is set to DHCP.
Parameter Type	<string> is a string with double quotation marks and the format is "xxx.xxx.xxx.xxx". Conform to the IP Sets standard (0-255:0-255:0-255:0-255).
Return	String
Default	None
Menu	System > I/O Setting > LAN Status > SUB Mask
Example	:SYSTem:COMMunicate:LAN:SMASk "255.255.255.0" :SYSTem:COMMunicate:LAN:SMASk? Return: "255.255.255.0"

3.16.2.5 Gateway

Command Format	:SYSTem:COMMunicate:LAN:GATeway <string> :SYSTem:COMMunicate:LAN:GATeway?
Instruction	Sets the gateway for the analyzer in the network. The gateway will be fetched automatically if the IP assignment is set to DHCP. Gets gateway.
Parameter Type	<string> is a string with double quotation marks and the format is "xxx.xxx.xxx.xxx". Conform to the IP Sets standard (0-255:0-255:0-255:0-255).
Return	String
Default	None
Menu	System > I/O Setting > LAN Status > Gateway
Example	:SYSTem:COMMunicate:LAN:GATeway "10.11.13.1" :SYSTem:COMMunicate:LAN:GATeway?

	Return: "10.11.13.1"

3.16.2.6 GPIB Address

Command Format	:SYSTem:COMMunicate:GPIB:ADDRess <numeric> :SYSTem:COMMunicate:GPIB:ADDRess?
Instruction	Sets/gets the gpib address for the network analyzer.
Parameter Type	<numeric>:represents the gpib address, and the parameter range: 1~30.
Return	Integer
Default	18
Menu	System > I/O Setting > GPIB
Example	:SYSTem:COMMunicate:GPIB:ADDRess 7 :SYSTem:COMMunicate:GPIB:ADDRess? Return: 7

3.16.3 Preset

3.16.3.1 Command List

Default Preset	:SYSTem:PRESet
Preset Option	:SYSTem:PRESet:TYPE
User Preset	:SYSTem:UPReset
Load User Preset File	SYSTem:UPReset:LOAD[:FILE]
Last Preset	:SYSTem:LPReset
Power On Option	:SYSTem:PON:TYPE
Power On Line State	:SYSTem:PONLine[:STATe]
Factory Reset	:SYSTem:FDEFault

3.16.3.2 Default Preset

Command Format	:SYSTem:PRESet
Instruction	This command presets the setting state of the VNA to the original factory setting.
Parameter Type	None
Return	None
Default	None
Menu	System > Preset > Preset Option is "Default", and at the same time execute System > Preset > Preset
Example	:SYSTem:PRESet

3.16.3.3 Preset Option

Command Format	:SYSTem:PRESet:TYPE <type>
Instruction	This command sets/gets the system preset type.
Parameter Type	<type>:={DEFault|LAST|USER}
Return	Enumeration
Default	None
Menu	Preset > Preset > Preset Option
Example	:SYSTem:PRESET:TYPE USER :SYSTem:PRESET:TYPE? Return: USER

3.16.3.4 User Preset

Command Format	:SYSTem:UPReset
Instruction	This command presets the VNA with the user settings. The command is executed regardless of the operation mode in preset state. If you try to specify a file for a preset (local:/user_preset.sta) that does not exist,

	an error will occur and this command will be ignored.
Parameter Type	None
Return	None
Default	None
Menu	System > Preset > Preset Option is "User", and at the same time execute System > Preset > Preset
Example	:SYSTem:UPReset

3.16.3.5 Load User Preset File

Command Format	:SYSTem:UPReset:LOAD[:FILE] <string>
Instruction	This command loads an existing instrument state file (.sta or .csa) to be used for User Preset.
Parameter Type	<string>: represents the file name.
Return	None
Default	None
Menu	None
Example	SYSTem:UPReset:LOAD "local/user_preset.sta"

3.16.3.6 Last Preset

Command Format	:SYSTem:LPReset
Instruction	This command presets the setting state of VNA to the settings before the last software shutdown.
Parameter Type	None
Return	None
Default	None

Menu	System > Preset > Preset Option is "Last", and at the same time execute System > Preset > Preset
Example	:SYSTem:LPReset

3.16.3.7 Power On Option

Command Format	:SYSTem:PON:TYPE <type> :SYSTem:PON:TYPE?
Instruction	This command sets/gets the system start type after power on.
Parameter Type	<type>:={DEFault|LAST|USER}
Return	Enumeration
Default	DEFault
Menu	Preset > Preset > Power On Option
Example	:SYSTem:PON:TYPE USER :SYSTem:PON:TYPE? Return: USER

3.16.3.8 Power On Line State

Command Format	:SYSTem:PONLine[:STATe] <bool> :SYSTem:PONLine[:STATe]?
Instruction	This command turns ON/OFF or returns the status of the system power on line state.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Preset > Preset > Power On Line
Example	:SYSTem:PONLine ON

	:SYSTem:PONLine? Return: 1

3.16.3.9 Factory Reset

Command Format	:SYSTem:FDEFault
Instruction	This command reset the system status return to factory state.
Parameter Type	None
Return	None
Default	None
Menu	Preset > Preset > Factory Reset
Example	:SYSTem:FDEFault

3.16.4 Help

3.16.4.1 Command List

Enable Message Display	:DISPlay:MESSage:STATe
Enable Power Unlevel Detection	:DISPlay:MESSage:POWer:UNLevel
State of Backlight	:SYSTem:BACKlight
Information About Power Meter	:SYSTem:COMMunicate:USB:PMETer:CATalog?

3.16.4.2 Enable Message Display

Command Format	:DISPlay:MESSage:STATe <bool> :DISPlay:MESSage:STATe?
Instruction	This command sets/gets the state of the enable message display.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean

Default	ON
Menu	Help > Messages Setting… > Enable Messages Display
Example	:DISP:MESS:STAT 0 :DISP:MESS:STAT? Return: 0

3.16.4.3 Enable Power Unlevel Detection

Command Format	:DISPlay:MESSage:POWer:UNLevel <bool> :DISPlay:MESSage:POWer:UNLevel?
Instruction	This command sets/gets the state of the enable power unlevel detection.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Help > Messages Setting… > Enable Power Unlevel Detection
Example	:DISPl:MESS:POW:UNL 0 :DISPl:MESS:POW:UNL? Return: 0

3.16.4.4 State of Backlight

Command Format	:SYSTem:BACKlight <bool> :SYSTem:BACKlight?
Instruction	This command turns ON/OFF or returns the status of the backlight of the LCD display.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	1

Menu	None
Example	:SYSTem:BACKlight OFF :SYSTem:BACKlight? Return: 0

3.16.4.5 Information About Power Meter

Command Format	:SYSTem:COMMunicate:USB:PMETer:CATalog?
Instruction	This command reads the identification information string of power meters.
Parameter Type	None
Return	Returns identification information about connected power meters.
Default	None
Menu	None
Example	:SYSTem:COMMunicate:USB:PMETer:CATalog?

3.16.5 Buzzer

3.16.5.1 Command List

Complete Buzzer	:SYSTem:BEEPer:COMPlete:IMMediate
Complete Buzzer State	:SYSTem:BEEPer:COMPlete:STATe
Warning Buzzer	:SYSTem:BEEPer:WARNing:IMMediate
Warning Buzzer State	:SYSTem:BEEPer:WARNing:STATe

3.16.5.2 Complete Buzzer

Command Format	:SYSTem:BEEPer:COMPlete:IMMediate
Instruction	This command generates a beep for the notification of the completion of an operation.

Parameter Type	None
Return	None
Default	None
Menu	System > Buzzer > Complete Test
Example	:SYSTem:BEEPer:COMPlete:IMMediate

3.16.5.3 Complete Buzzer State

Command Format	:SYSTem:BEEPer:COMPlete:STATe <bool> :SYSTem:BEEPer:COMPlete:STATe?
Instruction	This command turns ON/OFF or returns the status of the beeper for the notification of the completion of the operation.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	System > Buzzer > Complete Buzzer
Example	:SYSTem:BEEPer:COMPlete:STATe OFF :SYSTem:BEEPer:COMPlete:STATe? Return: 0

3.16.5.4 Warning Buzzer

Command Format	:SYSTem:BEEPer:WARNing:IMMediate
Instruction	This command generates a beep for the notification of warning/limit test results.
Parameter Type	None
Return	None
Default	None

Menu	System > Buzzer > Warning Test
Example	:SYSTem:BEEPer:WARNing:IMMediate

3.16.5.5 Warning Buzzer State

Command Format	:SYSTem:BEEPer:WARNing:STATe <bool> :SYSTem:BEEPer:WARNing:STATe?
Instruction	This command turns ON/OFF or returns the status of the beeper for the notification of warning/limit test results.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	System > Buzzer > Warning Buzzer
Example	:SYSTem:BEEPer:WARNing:STATe ON :SYSTem:BEEPer:WARNing:STATe? Return: 1

3.16.6 FIFO function

FIFO Overview

In a Vector Network Analyzer (VNA), FIFO (First-In-First-Out) is a data buffer. When the FIFO function is enabled, the VNA maintains a fixed-size storage area to hold data for rapid read/write access by users. FIFO data flow is controlled using SCPI commands related to the FIFO buffer. The data stored in the FIFO consists of raw data after averaging and scaling calculations, and has not undergone calibration, formatting, or data analysis processing.

FIFO Features:

- Users can write data into, and simultaneously read from the FIFO buffer.

- REAL/IMAGINARY pairs is the only supported format for the FIFO buffer.
- A maximum of 100,000 data points can be read for per query.
- When more than one measurement is present, data from each measurement is stored in the FIFO buffer in the following order as the table showned.These measurements are divided into multiple rows for easier access. S-parameters are converted into ratio measurements to determine their storage order in the FIFO. For example: S21 is placed into the FIFO in the same manner as B/R1.

4-port models	2-port models
R、A、B、C、D、 R/R、A/R、B/R、C/R、D/R、 R/A、A/A、B/A、C/A、D/A、 R/B、A/B、B/B、C/B、D/B、 R/C、A/C、B/C、C/C、D/C、 R/D、A/D、B/D、C/D、D/D	R1、R2、A、B、 R1/R1、R2/R1、A/R1、B/R1 R1/R2、R2/R2、A/R2、B/R2 R1/A、R2/A、A/A、B/A R1/B、R2/B、A/B、B/B

3.16.6.1 Command List

FIFO state	:SYSTem:FIFO[:STATe]
Clear the data from FIFO buffer	:SYSTem:FIFO:DATA:CLEar
Get total number of data points in the FIFO	:SYSTem:FIFO:DATA:COUNt?
Get number of bytes in the FIFO	:SYSTem:FIFO:DATA:BYTe:COUNt?
reads specific number of bytes	:SYSTem:FIFO:DATA:BYTe?
reads specified number of data points	:SYSTem:FIFO:DATA?

3.16.6.2 FIFO state

Command Format	:SYSTem:FIFO[:STATe] <bool> :SYSTem:FIFO[:STATe]?

Instruction	Sets and returns the state of data storage to the FIFO buffer. Syst:Preset or an instrument state recall also ends storage to the FIFO buffer. The FIFO buffer is cleared when set to OFF
Parameter Type	<bool>:=ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	None
Example	:SYSTem:FIFO ON :SYSTem:FIFO? Return:1

3.16.6.3 Clear the data from FIFO buffer

Command Format	:SYSTem:FIFO:DATA:CLEar
Instruction	Clears the data from the FIFO buffer
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:SYSTem:FIFO:DATA:CLEar

3.16.6.4 Get total number of data points in the FIFO

Command Format	:SYSTem:FIFO:DATA:COUNt?
Instruction	Returns the total number of data points in the FIFO buffer
Parameter Type	None
Return	Integer
Default	0

Menu	None
Example	:SYSTem:FIFO:DATA:COUNt? Return:0

3.16.6.5 Get number of bytes in the FIFO

Command Format	:SYSTem:FIFO:DATA:BYTe:COUNt?
Instruction	Returns a specific number of bytes in the FIFO
Parameter Type	None
Return	Integer
Default	0
Menu	None
Example	:SYSTem:FIFO:DATA:BYTe:COUNt? Return:0

3.16.6.6 reads specific number of bytes

Command Format	:SYSTem:FIFO:DATA:BYTe? <numeric>
Instruction	Returns a specific number of bytes to read
Parameter Type	<numeric>:represents the number of bytes, and the parameter range: 1~1600000.
Return	A byte array representing Numbers of byte (NOB). n is an integer between 1 and NOB.Element n-1: the NTH byte in the byte array.The array index starts at 0.
Default	None
Menu	None
Example	:SYSTem:FIFO:DATA:BYTe? 1000

3.16.6.7 reads specified number of data points

Command Format	:SYSTem:FIFO:DATA? <numeric>
Instruction	Reads a specified number of data points from the FIFO buffer. Each data point is returned as a real/imaginary pair.
Parameter Type	<numeric>:represents the number of data points, and the parameter range: 1~100000.
Return	Numbers of point (NOP) *2 array data. n is an integer between 1 and NOP. Data (n*2-2) : the NTH stored data (real part). Data (n*2-1) : the NTH stored data (imaginary part). The array index starts at 0.
Default	None
Menu	None
Example	:SYSTem:FIFO:DATA? 1000

3.16.7 External Ports

3.16.7.1 Characterize

3.16.7.1.1 Command List

Initialize Characterization	:SYSTem:EXTPort:SMATrix:CHAR:INIT
Query Characterization Task Item Count	:SYSTem:EXTPort:SMATrix:CHAR:STEP:COUNt?
Query Characterization Task Item Description	:SYSTem:EXTPort:SMATrix:CHAR:STEP<numeric>:DESC?
Execute Characterization Tasks	:SYSTem:EXTPort:SMATrix:CHAR:STEP<numeric>:ACQ
Save Characterization Data	:SYSTem:EXTPort:SMATrix:CHAR:SAVE
Termination	:SYSTem:EXTPort:SMATrix:CHAR:ABORt

Characterization	

3.16.7.1.2 Initialize Characterization

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:INIT
Instruction	Initialize the characterization, use the current channel for characterizing, and generate task items for the switch matrix characterization.
Parameter Type	None
Return	None
Default	None
Menu	System > External Ports > Characterize
Example	:SYSTem:EXTPort:SMATrix:CHAR:INIT

3.16.7.1.3 Query Characterization Task Item Count

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:STEP:COUNt?
Instruction	To obtain the number of characterization tasks through a query, one must complete all task items, which constitutes the completion of the characterization.
Parameter Type	None
Return	Integer
Default	None
Menu	System > External Ports > Characterize
Example	:SYSTem:EXTPort:SMATrix:CHAR:STEP:COUNt? Return: 7

3.16.7.1.4 Query Characterization Task Item Description

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:STEP<numeric>:DESC?

Instruction	Query the operation description for the specified task item.
Parameter Type	<numeric>:Which numbered task item.
Return	String
Default	None
Menu	System > External Ports > Characterize
Example	:SYSTem:EXTPort:SMATrix:CHAR:STEP1:DESC? Return: Cal Port1,2

3.16.7.1.5 Execute Characterization Tasks

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:STEP<numeric>:ACQ
Instruction	Execute specified tasks.
Parameter Type	<numeric>:Which numbered task item.
Return	None
Default	None
Menu	System > External Ports > Characterize > Measure
Example	:SYSTem:EXTPort:SMATrix:CHAR:STEP1:ACQ

3.16.7.1.6 Save Characterization Data

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:SAVE <string>
Instruction	Save characterization data.
Parameter Type	<string>:The path and name of the characterization switch matrix (.csm) file.
Return	None
Default	None
Menu	System > External Ports > Characterize > Finish
Example	:SYSTem:EXTPort:SMATrix:CHAR:SAVE "local/test.csm"

3.16.7.1.7 Termination Characterization

Command Format	:SYSTem:EXTPort:SMATrix:CHAR:ABORt
Instruction	Termination characterization.
Parameter Type	None
Return	None
Default	None
Menu	System > External Ports > Characterize > Cancel
Example	:SYSTem:EXTPort:SMATrix:CHAR:ABORt

3.16.7.2 De-embed

3.16.7.2.1 Command List

Previous De-embedding Parameters	:SYSTem:EXTPort:SMATrix:DEEMbed:DISCard
Apply De-embedding Parameters	:SYSTem:EXTPort:SMATrix:DEEMbed:APPLy
Characterize Switch Matrix Data	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:NAME
Use Characterization Sweep Parameters	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:STIMulus:STATe
De-embedding Port	:SYSTem:EXTPort:SMATrix:DEEMbed:PORTs
De-embedding Calibration Type	:SYSTem:EXTPort:SMATrix:DEEMbed:METHod
De-embedding Channel	:SYSTem:EXTPort:SMATrix:DEEMbed:CHANnel

3.16.7.2.2 Previous De-embedding Parameters

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:DISCard

Instruction	Discard unapplied de-embedding parameters and restore to the previously saved state.
Parameter Type	None
Return	None
Default	None
Menu	System > External Ports > De-embed > Cancel
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:DISCard

3.16.7.2.3 Apply De-embedding Parameters

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:APPLy
Instruction	Apply de-embedding parameters.
Parameter Type	None
Return	None
Default	None
Menu	System > External Ports > De-embed > Apply
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:APPLy

3.16.7.2.4 Characterize Switch Matrix Data

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:NAME <string> :SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:NAME?
Instruction	This command sets/gets the characterization data of the switch matrix for de-embedding.
Parameter Type	<string>:The path and name of the characterization switch matrix (.csm) file.
Return	String
Default	None
Menu	System > External Ports > De-embed > Characterize Switch Matrix file

Example	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:NAME "local/test.csm" :SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:NAME? Return: local/test.csm

3.16.7.2.5 Use Characterization Sweep Parameters

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:STIMulus:STATe <bool> :SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:STIMulus:STATe?
Instruction	This command sets/gets the sweep parameters for determining whether to use a characterization switch matrix when de-embedding.
Parameter Type	<bool>:=ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	0 or OFF
Menu	System > External Ports > De-embed > Change the channel's stimulus to the Cal Set
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:STIMulus:STATe 1 :SYSTem:EXTPort:SMATrix:DEEMbed:CALSet:STIMulus:STATe? Return: 1

3.16.7.2.6 De-embedding Port

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:PORTs <pnum> :SYSTem:EXTPort:SMATrix:DEEMbed:PORTs?
Instruction	This command sets/gets the port to be de-embedded.
Parameter Type	<pnum>:De-embedded Port Set.
Return	String
Default	None
Menu	System > External Ports > De-embed > Ports
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:PORTs 1,2

	:SYSTem:EXTPort:SMATrix:DEEMbed:PORTs? Return: 1,2

3.16.7.2.7 De-embedding Calibration Type

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:METHod <type> :SYSTem:EXTPort:SMATrix:DEEMbed:METHod?
Instruction	This command sets/gets the de-embedding calibration type.
Parameter Type	<type>:={OSL|SOLT} "OSL": Single-Port Calibration. "SOLT": Multi-Port Calibration.
Return	Enumeration
Default	None
Menu	System > External Ports > De-embed > Type
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:METHod SOLT :SYSTem:EXTPort:SMATrix:DEEMbed:METHod? Return: SOLT

3.16.7.2.8 De-embedding Channel

Command Format	:SYSTem:EXTPort:SMATrix:DEEMbed:CHANnel <cnum>
Instruction	Set the channel to be de-embedded; if not specified, de-embed the current channel.
Parameter Type	<cnum>:De-embed Channel Set.
Return	String
Default	Channel 1
Menu	System > External Ports > De-embed > Channel
Example	:SYSTem:EXTPort:SMATrix:DEEMbed:CHANnel 1,2

3.17 Trigger Commands

3.17.1 Command List

Channel trigger mode	:SENSe<cnum>:SWEep:MODE
Trigger Restart	:ABORt
Continuous Initiation Mode	:INITiate<cnum>:CONTinuous
Single Trigger Mode	:INITiate<cnum>[:IMMediate]
Trigger Source	:TRIGger[:SEQuence]:SOURce
Trigger Command	:TRIGger[:SEQuence]:SINGle
Trigger Command	:TRIGger[:SEQuence][:IMMediate]
Trigger Scope	:TRIGger[:SEQuence]:SCOPe
Trigger Event	:TRIGger[:SEQuence]:POINt
Polarity of the External Trigger Input Port	:TRIGger:SEQuence:EXTernal:SLOPe
Delay of the External Trigger Source	:TRIGger[:SEQuence]:EXTernal:DELay
External Trigger Output Port State	:TRIGger:OUTPut:STATe
Polarity of the Pulse	:TRIGger:OUTPut:POLarity
Position of the Pulse	:TRIGger:OUTPut:POSition

3.17.2 Channel trigger mode

Command Format	:SENSe<cnum>:SWEep:MODE <type> :SENSe<cnum>:SWEep:MODE?
Instruction	Set how many triggers will each channel accept before going into hold.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={HOLD|SINGLe|CONTinuous} • HOLD - channel will not trigger. • CONTinuous - channel triggers indefinitely. • SINGle - channel accepts one trigger, then goes to HOLD.

Return	String
Default	CONTinuous
Menu	Trigger > Trigger
Example	:SENSe:SWEep:MODE HOLD :SENSe:SWEep:MODE? Return:HOLD

3.17.3 Trigger Restart

Command Format	:ABORt
Instruction	This command stops the current sweeps and immediately sends a trigger. Then, after measurement is executed once, it goes back to the idle state.
Parameter Type	None
Return	None
Default	None
Menu	Trigger > Restart
Example	:ABORt

3.17.4 Continuous Initiation Mode

Command Format	:INITiate<cnum>:CONTinuous <bool> :INITiate<cnum>:CONTinuous?
Instruction	This command turns ON/OFF the continuous initiation mode of selected channel in the trigger system.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0 True or ON:Turns ON the continuous initiation mode. False or OFF:Turns OFF the continuous initiation mode.

Return	Boolean
Default	0
Menu	Trigger > Continuous/Hold
Example	:INITiate1:CONTinuous 1 :INITiate1:CONTinuous? Return: 1

3.17.5 Single Trigger Mode

Command Format	:INITiate<cnum>[:IMMediate]
Instruction	This command changes the state of each channel of selected channel to the initiation state in the trigger system. When this object is executed for a channel in the hold state, it goes into the single state immediately. Then, after measurement is executed once, it goes back to the hold state.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.
Return	None
Default	None
Menu	Trigger > Single
Example	:INITiate1

3.17.6 Trigger Source

Command Format	:TRIGger[:SEQuence]:SOURce <type> :TRIGger[:SEQuence]:SOURce?
Instruction	This command sets/gets the trigger source from the following 4 types: Internal Trigger Uses the internal trigger to generate continuous triggers automatically.

	External Trigger Generates a trigger when the trigger signal is inputted externally via the Ext Trig connector or the handler interface. Manual Trigger Generates a trigger when the key operation of Trigger > Trigger is executed from the front panel. Bus Trigger Generates a trigger when the SCPI.IEEE4882.TRG object is executed.
Parameter Type	<type>:={INTernal|EXTernal|MANual|BUS}
Return	Enumeration
Default	INTernal
Menu	Trigger > Trigger Source
Example	:TRIGger:SOURce EXTernal :TRIGger:SOURce? Return: EXT

3.17.7 Trigger Command

Command Format	:TRIGger[:SEQuence]:SINGle :TRIG:SING
Instruction	The trigger system is in a trigger wait state (i.e. the trigger mode is Single or Continuous, and the trigger source is Bus or Manual), and sending the command will immediately generates the trigger and performs the measurement. If the command is followed by *OPC? Make inquiries until the trigger and measurement are complete *OPC? return 1. For specific examples, see "Waiting for Trigger State (OPC?)" in Chapter 4.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:TRIGger:SEQuence:SOURce BUS

	:TRIGger:SEQuence:SINGle *OPC? Return：1 # Only wait until the trigger and the sweep measurement are complete the *OPC? return 1.

3.17.8 Trigger Command

Command Format	:TRIGger[:SEQuence][:IMMediate]
Instruction	The trigger system is in a trigger wait state (i.e. the trigger mode is Single or Continuous, and the trigger source is Bus or Manual), and sending the command immediately generates the trigger and performs the measurement. If the command is followed by *OPC? Make inquiries, *OPC? 1 is returned immediately, indicating that this instruction has been executed.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:TRIGger:SEQuence:SOURce BUS :TRIGger:SEQuence:IMMediate *OPC? Return:1 #1 is returned immediately.

3.17.9 Trigger Scope

Command Format	:TRIGger[:SEQuence]:SCOPe <type> :TRIGger[:SEQuence]:SCOPe?
Instruction	This command sets/gets the effective scope of triggering. When this function is enabled with a value of "ACTive", only active channel is triggered. When this function is enabled with a value of "ALL", all channels are triggered.
Parameter Type	<type>:={ALL|ACTive}

Return	Enumeration
Default	ALL
Menu	Trigger > Trigger Scope
Example	:TRIGger:SCOPe ACTive :TRIGger:SCOPe? Return: ACT

3.17.10 Trigger Event

Command Format	:TRIGger[:SEQuence]:POINt <bool> :TRIGger[:SEQuence]:POINt?
Instruction	This command turns ON/OFF or returns the status of the point trigger feature.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Trigger > Trigger Setup > Trigger Event
Example	:TRIGger:POINt 1 :TRIGger:POINt? Return: 1

3.17.11 Polarity of the External Trigger Input Port

Command Format	:TRIGger:SEQuence:EXTernal:SLOPe <type> :TRIGger:SEQuence:EXTernal:SLOPe?
Instruction	This command sets/gets the polarity of the External Trigger Input Port.
Parameter Type	<type>:={POSitive|NEGative}
Return	Enumeration
Default	POSitive

Menu	Trigger > Trigger Setup > Ext Trig Input
Example	:TRIGger:SEQuence:EXTernal:SLOPe NEGative :TRIGger:SEQuence:EXTernal:SLOPe? Return: NEG

3.17.12 Delay of the External Trigger Source

Command Format	:TRIGger[:SEQuence]:EXTernal:DELay <numeric> :TRIGger[:SEQuence]:EXTernal:DELay?
Instruction	This command sets/gets the time that it takes from receiving the trigger to starting measurement when the trigger source is external.
Parameter Type	<numeric>:represents the external trigger delay time.
Return	Float, unit: s (second)
Default	0
Menu	Trigger > Trigger Setup > Trigger Delay
Example	:TRIGger:EXTernal:DELay 1 :TRIGger:EXTernal:DELay? Return: 1

3.17.13 External Trigger Output Port State

Command Format	:TRIGger:OUTPut:STATe <bool> :TRIGger:OUTPut:STATe?
Instruction	This command sets/gets the External Trigger Output Port state.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Trigger > Trigger Setup > Ext Trig output

Example	:TRIGger:OUTPut:STATe 1 :TRIGger:OUTPut:STATe? Return: 1

3.17.14 Polarity of the Pulse

Command Format	:TRIGger:OUTPut:POLarity <type> :TRIGger:OUTPut:POLarity?
Instruction	This command sets/gets the polarity of the pulse generated by the External Trigger Output Port.
Parameter Type	<type>:={POSitive|NEGative}
Return	Enumeration
Default	POSitive
Menu	Trigger > Trigger Setup > Polarity
Example	:TRIGger:OUTPut:POLarity NEGative :TRIGger:OUTPut:POLarity? Return: NEG

3.17.15 Position of the Pulse

Command Format	:TRIGger:OUTPut:POSition <type> :TRIGger:OUTPut:POSition?
Instruction	This command sets/gets the position of the External Trigger Output Port.
Parameter Type	<type>:={AFTer|BEFore}
Return	Enumeration
Default	AFTer
Menu	Trigger > Trigger Setup > Position
Example	:TRIGger:OUTPut:POSition BEFore

	:TRIGger:OUTPut:POSition? Return: BEF

3.18 Switch Matrix Commands

3.18.1 Command list

Ext Port Enabled	:SYSTem:EXTPort[:STATe]
Get the numbers of the switch matrices	:SYSTem:EXTPort:SMATrix:CATalog?
Get the model of switch matrices	:SYSTem:EXTPort:SMATrix<num>:MODel?
Get the serial of switch matrices	:SYSTem:EXTPort:SMATrix<num>:SERial?
Starts a manual RF connection configuration	:SYSTem:EXTPort:SMATrix:CONFigure:STARt
Aborts a manual RF connection configuration	:SYSTem:EXTPort:SMATrix:CONFigure:ABORt
Ends a manual RF connection configuration	:SYSTem:EXTPort:SMATrix:CONFigure:END
Sets the RF connection between the switch matrix and VNA physical ports	:SYSTem:EXTPort:SMATrix:CONFigure:TVNA
Sets the RF connections between switch matrix and VNA	:SYSTem:EXTPort:SMATrix<num>:CONFigure:MVNA
Sets the matrix RF output port to VNA ports	:SYSTem:EXTPort:SMATrix<num>:CONFigure:MTESt

3.18.2 Ext Port Enabled

Command Format	:SYSTem:EXTPort[:STATe] <bool> :SYSTem:EXTPort[:STATe]?
Instruction	Set or get the state of the Ext Port function.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	None
Menu	System >External Ports > Ext Port Enabled
Example	:SYSTem:EXTPort:STATe 1 :SYSTem:EXTPort:STATe?

	Return 1

3.18.3 Get the numbers of the switch matrices

Command Format	:SYSTem:EXTPort:SMATrix:CATalog?
Instruction	Queries the numbers of the switch matrices currently part of the RF configuration. When connecting multiple switch matrices, The response is return a comma-separated list of switch matrix numbers.
Parameter Type	None
Return	string
Default	1
Menu	None
Example	If connecting 2 switch matrices, then: :SYSTem:EXTPort:SMATrix:CATalog? Return 1,2

3.18.4 Get the model of switch matrices

Command Format	:SYSTem:EXTPort:SMATrix<num>:MODel?
Instruction	Get the model of the connected switch matrix.
Parameter Type	<num>: switch matrix number
Return	String
Default	None
Menu	None
Example	:SYSTem:EXTPort:SMATrix1:MODel? Return “SSM5124”

3.18.5 Get the serial of switch matrices

Command Format	:SYSTem:EXTPort:SMATrix<num>:SERial?
Instruction	Get the serial of the connected switch matrix.
Parameter Type	<num>: switch matrix number
Return	String
Default	None
Menu	None
Example	:SYSTem:EXTPort:SMATrix1:SERial? Return “SSM5AAAX7R0003”

3.18.6 Starts a manual RF connection configuration

Command Format	:SYSTem:EXTPort:SMATrix:CONFigure:STARt
Instruction	Start a manual RF connection configuration, An RF connection configuration comprises the RF connections between the VNA, a set of switch matrices and the DUT test ports. This command with a":SYSTem:EXTPort:SMATrix:CONFigure:END" used in pairs, make a modified configuration to take effect.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	#Enable the Ext Port function :SYSTem:EXTPort:STATe 1 #Start a manual RF connection configuration :SYSTem:EXTPort:SMATrix:CONFigure:STARt #Define non-default matrix-VNA port connections: matrix port 1 to VNA port 2, matrix port 2 to VNA port 4, matrix port 3 to VNA port 1 and matrix port 4 to VNA port 3 :SYSTem:EXTPort:SMATrix1:CONFigure:MVNA 1,2,2,4,3,1,4,3

	#Configure 4 matrix test ports only: matrix test port 1 is test port 1, matrix test port 7 is test port 2, matrix test port 11 is test port 3 and matrix test port 22 is test port 4. :SYSTem:EXTPort:SMATrix1:CONFigure:MTESt 1,1,7,2,11,3,22,4 #Apply the manual RF connection configuration. :SYSTem:EXTPort:SMATrix:CONFigure:END

3.18.7 Aborts a manual RF connection configuration

Command Format	:SYSTem:EXTPort:SMATrix:CONFigure:ABORt
Instruction	Aborts a manual RF connection configuration and the new configuration is discarded.
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:SYSTem:EXTPort:SMATrix:CONFigure:ABORt

3.18.8 Ends a manual RF connection configuration

Command Format	:SYSTem:EXTPort:SMATrix:CONFigure:END
Instruction	Ends a manual RF connection configuration: if the configuration is valid, it will be activated ("commit"). Otherwise an error is returned and the new configuration is discarded, and the previous configuration remains active
Parameter Type	None
Return	None
Default	None
Menu	None
Example	:SYSTem:EXTPort:SMATrix:CONFigure:END

3.18.9 Sets the RF connection between the switch matrix and VNA physical ports

Command Format	:SYSTem:EXTPort:SMATrix:CONFigure:TVNA <testport1>,<VNAport1>[,<testport2>,<VNAport2> [...]]
Instruction	Set the connection between the VNA physical port and the RF output port of the matrix switch, that is, the RF output port of the matrix switch is directly assigned to the VNA physical port.
Parameter Type	<testport1>:Number of the RF output port of the matrix switch. <VNAport1>:Number of the VNA physical port.
Return	None
Default	None
Menu	None
Example	Switch Matrix's RF Ports 1,2,3,4are assigned to VNA ports 1,2,3,4 :SYSTem:EXTPort:SMATrix:CONFigure:STARt :SYSTem:EXTPort:SMATrix:CONFigure:TVNA 1,1,2,2,3,3,4,4 :SYSTem:EXTPort:SMATrix:CONFigure:END

3.18.10 Sets the RF connections between switch matrix and VNA

Command Format	:SYSTem:EXTPort:SMATrix<num>:CONFigure:MVNA {<matrixVNAport>,<VNAPort>}
Instruction	Sets the RF connections between switch matrix and VNA as a comma-separated list of port numbers.
Parameter Type	<num>: switch matrix number <matrixVNAport>: Number of the RF output port of the matrix switch. <VNAPort>: Number of the VNA physical port.
Return	None
Default	None
Menu	None

Example	#Enable the Ext Port function :SYSTem:EXTPort:STATe 1 #Start a manual RF connection configuration :SYSTem:EXTPort:SMATrix:CONFigure:STARt #Define non-default matrix-VNA port connections: matrix port 1 to VNA port 2, matrix port 2 to VNA port 4, matrix port 3 to VNA port 1 and matrix port 4 to VNA port 3 :SYSTem:EXTPort:SMATrix1:CONFigure:MVNA 1,2,2,4,3,1,4,3 #Configure 4 matrix test ports only: matrix test port 1 is test port 1, matrix test port 7 is test port 2, matrix test port 11 is test port 3 and matrix test port 22 is test port 4. :SYSTem:EXTPort:SMATrix1:CONFigure:MTESt 1,1,7,2,11,3,22,4 #Apply the manual RF connection configuration. :SYSTem:EXTPort:SMATrix:CONFigure:END

3.18.11 Sets the matrix RF output port to VNA ports

Command Format	:SYSTem:EXTPort:SMATrix<num>:CONFigure:MTESt {<MatrixTestPort>,<Testport>}
Instruction	Sets the matrix test port connections as a comma-separated list of port numbers
Parameter Type	<num>: switch matrix number <MatrixTestPort>: Number of the RF output port of the matrix switch. <Testport>: Number of the VNA physical port.
Return	None
Default	None
Menu	None
Example	#Enable the Ext Port function :SYSTem:EXTPort:STATe 1 #Start a manual RF connection configuration :SYSTem:EXTPort:SMATrix:CONFigure:STARt #Define non-default matrix-VNA port connections: matrix port 1 to

	VNA port 2, matrix port 2 to VNA port 4, matrix port 3 to VNA port 1 and matrix port 4 to VNA port 3 :SYSTem:EXTPort:SMATrix1:CONFigure:MVNA 1,2,2,4,3,1,4,3 #Configure 4 matrix test ports only: matrix test port 1 is test port 1, matrix test port 7 is test port 2, matrix test port 11 is test port 3 and matrix test port 22 is test port 4. :SYSTem:EXTPort:SMATrix1:CONFigure:MTESt 1,1,7,2,11,3,22,4 #Apply the manual RF connection configuration. :SYSTem:EXTPort:SMATrix:CONFigure:END

3.19 Pulse Measurement Commands (Option, SHN900A series models do not support)

3.19.1 Command List

Pulse Measurement Mode	:SENSe<cnum>:SWEep:PULSe:MODE
Pulse Width	:SENSe<cnum>:SWEep:PULSe:PRIMary:WIDth
Pulse Period	:SENSe<cnum>:SWEep:PULSe:PRIMary:PERiod
Pulse Frequency	:SENSe<cnum>:SWEep:PULSe:PRIMary:FREQuency
Pulse Delay	:SENSe<cnum>:SWEep:PULSe:PRIMary:DELay
Gain Mode of All Receivers	:SENSe<cnum>:SWEep:PULse:GAIN:MODE
Gain Mode of Specified Receiver	:SENSe<cnum>:SWEep:PULse:RECeiver:GAIN:MODE
Receiver's Pulse Delay	:SENSe<cnum>:PULSe:MEASurement:DELay
Auto select Profile Sweep Time State	:SENSe<cnum>:SWEep:PULSe:CWTime:[AUTO]
Auto select Width and Delay State	:SENSe<cnum>:SWEep:PULSe:TIMing:[AUTO]

3.19.2 Pulse Measurement Mode

Command Format	:SENSe<cnum>:SWEep:PULSe:MODE <type>

	:SENSe<cnum>:SWEep:PULSe:MODE?
Instruction	This command sets/gets the pulse measurement mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={OFF|STD|PROFile}, represents the pulse measurement mode.
Return	Enumeration
Default	OFF
Menu	Sweep > Pulse Setup > Pulse Measurement
Example	:SENS:SWE:PULS:MODE STD :SENS:SWE:PULS:MODE? Return: STD

3.19.3 Pulse Width

Command Format	:SENSe<cnum>:SWEep:PULSe:PRIMary:WIDth <numeric> :SENSe<cnum>:SWEep:PULSe:PRIMary:WIDth?
Instruction	This command sets/gets the pulse width of the source pulse.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: represents Pulse width in Second. The range is 1us to 1000s.
Return	Float, in Second.
Default	200us
Menu	Sweep > Pulse Setup > Pulse Timing > Pulse Width
Example	:SENS:SWE:PULS:PRIM:WID 0.0005 :SENS:SWE:PULS:PRIM:WID? Return: 0.0005

3.19.4 Pulse Period

Command Format	:SENSe<cnum>:SWEep:PULSe:PRIMary:PERiod <numeric> :SENSe<cnum>:SWEep:PULSe:PRIMary:PERiod?
Instruction	This command sets/gets the pulse period of the source pulse.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: represents Pulse width in Second. The range is 1us to 1000s.
Return	Float, in Second.
Default	1ms
Menu	Sweep > Pulse Setup > Pulse Timing > Pulse Period
Example	:SENS:SWE:PULS:PRIM:PER 0.002 :SENS:SWE:PULS:PRIM:PER? Return: 0.002

3.19.5 Pulse Frequency

Command Format	:SENSe<cnum>:SWEep:PULSe:PRIMary:FREQuency <numeric> :SENSe<cnum>:SWEep:PULSe:PRIMary:FREQuency?
Instruction	This command sets/gets the pulse frequency of the source pulse.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: represents Pulse frequency in Hz. The range is 1mHz to 1MHz.
Return	Float, in Hz.
Default	1kHz
Menu	Sweep > Pulse Setup > Pulse Timing > Pulse Frequency
Example	:SENS:SWE:PULS:PRIM:FREQ 100000 :SENS:SWE:PULS:PRIM:FREQ?

	Return: 100000

3.19.6 Pulse Delay

Command Format	:SENSe<cnum>:SWEep:PULSe:PRIMary:DELay <numeric> :SENSe<cnum>:SWEep:PULSe:PRIMary:DELay?
Instruction	This command sets/gets the pulse delay of the source pulse.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: represents Pulse delay in Second. The range is 1us to 1000s.
Return	Float, in Second.
Default	200us
Menu	Sweep > Pulse Setup > Pulse Timing > Pulse Delay
Example	:SENS:SWE:PULS:PRIM:DEL 0.0004 :SENS:SWE:PULS:PRIM:DEL? Return: 0.0004

3.19.7 Gain Mode of All Receivers

Command Format	:SENSe<cnum>:SWEep:PULse:GAIN:MODE <type>
Instruction	This command sets the gain mode of all receivers.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={LOW|MEDIum|HIGH}, represents the gain mode of receivers.
Return	None
Default	None
Menu	Sweep > Pulse Setup > Properties > Setting…
Example	:SENS:SWE:PUL:GAIN:MODE HIGH

3.19.8 Gain Mode of Specified Receiver

Command Format	:SENSe<cnum>:SWEep:PULSe:RECeiver:GAIN:MODE <type1>,<type2> :SENSe<cnum>:SWEep:PULSe:RECeiver:GAIN:MODE? <type1>
Instruction	This command sets the gain mode of a specified receivers.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type1>:={A|B|C|D|R1|R2|R3|R4}, represents receiver. <type2>:={LOW|MEDIum|HIGH}, represents the gain mode of receivers.
Return	Enumeration
Default	LOW
Menu	Sweep > Pulse Setup > Properties > Setting…
Example	:SENS:SWEep:PULse:RECeiver:ATTen:MODE A,HIGH :SENS:SWEep:PULse:RECeiver:ATTen:MODE? A Return: HIGH

3.19.9 Receiver's Pulse Delay

Command Format	:SENSe<cnum>:PULSe:MEASurement:DELay <numeric> :SENSe<cnum>:PULSe:MEASurement:DELay?
Instruction	This command sets/gets the pulse delay of the receiver.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents Receiver's pulse delay in Second. The range is 1us to 1000s.
Return	Float, in Second.
Default	309us
Menu	Sweep > Pulse Setup > Measurement Timing > Measurement Delay

Example	:SENS:PULSe:MEASurement:DELay 0.0004 :SENS:PULSe:MEASurement:DELay? Return: 0.0004

3.19.10 Auto select Profile Sweep Time State

Command Format	:SENSe<cnum>:SWEep:PULSe:CWTime:[AUTO] <bool> :SENSe<cnum>:SWEep:PULSe:CWTime:[AUTO]?
Instruction	This command sets/gets whether to check the autoselect profile sweep time option.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > Pulse Setup > Properties > Autoselect Profile Sweep Time
Example	:SENS:SWE:PULS:CWT 1 :SENS:SWE:PULS:CWT? Return: 1

3.19.11 Auto select Width and Delay State

Command Format	:SENSe<cnum>:SWEep:PULSe:TIMing:[AUTO] <bool> :SENSe<cnum>:SWEep:PULSe:TIMing:[AUTO]?
Instruction	This command sets/gets whether to check the autoselect width and delay option.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	Sweep > Pulse Setup > Measurement Timing > Autoselect Width and Delay
Example	:SENS:SWE:PULS:CWT 1 :SENS:SWE:PULS:CWT? Return: 1

3.20 Spectrum Analyzer Commands(Option)

3.20.1 Swept SA

3.20.1.1 Command List

Active SA	:CALCulate<cnum>:CUSTom:DEFine
SA measure mode	:CALCulate<cnum>:TRACe<tnum>:SA:MEASure
Resolution Bandwidth	:SENSe<cnum>:SA:BANDwidth[:RESolution]
RBW Mode	:SENSe<cnum>:SA:BANDwidth[:RESolution]:AUTO
Video Bandwidth	:SENSe<cnum>:SA:BANDwidth:VIDeo
VBW Mode	:SENSe<cnum>:SA:BANDwidth:VIDeo:AUTO
RBW/VBW Ratio	:SENSe<cnum>:SA:BANDwidth:VIDeo:RATio
Span/RBW Ratio	:SENSe<cnum>:SA:FREQuency:SPAN:BANDwidth:RESolution:RATio
Averaging Type	:SENSe<cnum>:SA:BANDwidth:VIDeo:AVER:TYPE
Image Reject Type	:SENSe<cnum>:SA:IMAGe:REJect
Detection type	:SENSe<cnum>:TRACe<tnum>:SA:DETector[:FUNCtion]
Auto detector mode	:SENSe<cnum>:TRACe<tnum>:SA:DETector:AUTO
SA trace type	:SENSe<cnum>:TRACe<tnum>:SA:TYPE
SA Trace display status	:SENSe<cnum>:TRACe<tnum>:SA:DISPlay[:STATe]
SA trace average count	:SENSe<cnum>:TRACe<tnum>:SA:AVERage:COUNt
SA trace calculate type	:CALCulate<cnum> [:SELected]:SA:MATH:FUNCtion
Input X trace calculate	:CALCulate<cnum> [:SELected]:SA:MATH:X
Input Y trace calculate	:CALCulate<cnum> [:SELected]:SA:MATH:Y

Log offset of trace calculate	:CALCulate<cnum> [:SELected]:SA:MATH:OFFSet
Reference level for log subtract	:CALCulate<cnum> [:SELected]:SA:MATH:REFerence
Enable state for correction	:SENSe<cnum> [:SELected]:SA:CORRections [:STATe]
Enable state for sub correction	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>.[:STATe]
Add correction items	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:ADD<freq>
Delete the correction item	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:POINt:DELete
Delete all the correction items	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:DELete

3.20.1.2 Active SA

Command Format	:CALCulate<cnum>:CUSTom:DEFine <string>
Instruction	This command activate the SA function of selecting channel trace and its measurement item
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <string>:= "SA"|"spectrum analyzer"
Return	String
Default	"SA"
Menu	Meas > Mode > Spectrum Analyzer
Example	:CALCulate1:CUSTom:DEFine "SA"

3.20.1.3 SA measure mode

Command Format	:CALCulate<cnum>[:SELected]:SA:MEASure <type> :CALCulate<cnum>[:SELected]:SA:MEASure? :CALCulate<cnum>:TRACe<tnum>:SA:MEASure <type> :CALCulate<cnum>:TRACe<tnum>:SA:MEASure?

Instruction	Set or get SA measure mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={SA|CHPower|ACPR|OBW|TOI} SA：Spectrum Analyzer ACPR：ACPR CHPower：Channel Power OBW：Occupied BW TOI: Third-order Intercept Point
Return	Enumeration
Default	SA
Menu	Meas > Mode > SA > Meas
Example	:CALCulate1:SELected:SA:MEASure OBW :CALCulate1:SELected:SA:MEASure? Return:OBW :CALCulate1:TRACe1:SA:MEASure ACPR :CALCulate1:TRACe1:SA:MEASure? Return:ACPR

3.20.1.4 Resolution Bandwidth

Command Format	:SENSe<cnum>:SA:BANDwidth[:RESolution] <numeric> :SENSe<cnum>:SA:BANDwidth[:RESolution]?
Instruction	This command set/reads the Resolution Bandwidth value.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the Resolution Bandwidth value, and the parameter range: 10~1000000.

Return	Integer, unit: Hz
Default	1MHz
Menu	Avg BW > BW > RBW
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:RESolution 3000 :SENSe1:SA:BANDwidth:RESolution? Return: 3000

3.20.1.5 RBW Mode

Command Format	:SENSe<cnum>:SA:BANDwidth[:RESolution]:AUTO <bool> :SENSe<cnum>:SA:BANDwidth[:RESolution]:AUTO?
Instruction	Sets / reads the mode of the resolution bandwidth. When ON, the resolution bandwidth is set based on Span/RBW ratio.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Avg BW > BW > RBW Mode
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:RESolution:AUTO 0 :SENSe1:SA:BANDwidth:RESolution:AUTO? Return: 0

3.20.1.6 Video Bandwidth

Command Format	:SENSe<cnum>:SA:BANDwidth:VIDeo <numeric> :SENSe<cnum>:SA:BANDwidth:VIDeo?

Instruction	This command set/reads the Video Bandwidth value.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the Video Bandwidth value, and the parameter range: 10~1000000.
Return	Integer, unit: Hz
Default	1MHz
Menu	Avg BW > BW > VBW
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:VIDeo 10000 :SENSe1:SA:BANDwidth:VIDeo? Return: 10000

3.20.1.7 VBW Mode

Command Format	:SENSe<cnum>:SA:BANDwidth:VIDeo:AUTO <bool> :SENSe<cnum>:SA:BANDwidth:VIDeo:AUTO?
Instruction	Sets / reads the mode of the Video bandwidth. When ON, the resolution bandwidth is set based on RBW/VBW ratio.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Avg BW > BW > RBW Mode
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:VIDeo:AUTO 0 :SENSe1:SA:BANDwidth:VIDeo:AUTO? Return: 0

3.20.1.8 RBW/VBW Ratio

Command Format	:SENSe<cnum>:SA:BANDwidth:VIDeo:RATio <numeric> :SENSe<cnum>:SA:BANDwidth:VIDeo:RATio?
Instruction	Sets / reads the RBW/VBW ratio.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the RBW/VBW ratio, and the parameter range: 0.001~1000.
Return	Float
Default	1
Menu	Avg BW > BW > RBW/VBW
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:VIDeo:RATio 0.3 :SENSe1:SA:BANDwidth:VIDeo:RATio? Return: 0.3

3.20.1.9 Span/RBW Ratio

Command Format	:SENSe<cnum>:SA:FREQuency:SPAN:BANDwidth:RESolution:RATio <numeric> :SENSe<cnum>:SA:FREQuency:SPAN:BANDwidth:RESolution:RATio?
Instruction	Sets / reads the Span/RBW ratio.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the Span/RBW ratio, and the parameter range: 0.001~1000.
Return	Integer
Default	1
Menu	Avg BW > BW > Span/RBW
Example	:CALCulate1:CUSTom:DEFine "SA"

	:SENSe1:SA:BANDwidth:VIDeo:RATio 10 :SENSe1:SA:BANDwidth:VIDeo:RATio? Return: 10

3.20.1.10 Averaging Type

Command Format	:SENSe<cnum>:SA:BANDwidth:VIDeo:AVER:TYPE <type> :SENSe<cnum>:SA:BANDwidth:VIDeo:AVER:TYPE?
Instruction	Sets / reads the type of the Averaging.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={Log|Power|Voltage}
Return	Enumeration
Default	LOG
Menu	Avg BW > BW > Avg Type
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:BANDwidth:VIDeo:AVER:TYPE Voltage :SENSe1:SA:BANDwidth:VIDeo:AVER:TYPE? Return: VOLT

3.20.1.11 Image Reject Type

Command Format	:SENSe<cnum>:SA:IMAGe:REJect <type> :SENSe<cnum>:SA:IMAGe:REJect?
Instruction	Sets / reads the type of the image reject.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={None|Min|Normal|Better|Max}
Return	Enumeration

Default	Normal
Menu	Sweep > SA Setup… > Advanced > Image Reject
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:IMAGe:REJect Max :SENSe1:SA:IMAGe:REJect? Return: MAX

3.20.1.12 Detection type

Command Format	:SENSe<cnum>[:SELected]:SA:DETector[:FUNCtion] <type> :SENSe<cnum>[:SELected]:SA:DETector[:FUNCtion]? :SENSe<cnum>:TRACe<tnum>:SA:DETector[:FUNCtion] <type> :SENSe<cnum>:TRACe<tnum>:SA:DETector[:FUNCtion]?
Instruction	Sets or gets the detection type of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={NEGative|POSitive|SAMPle|AVERage|NORMAL}
Return	Enumeration
Default	NORMAL
Menu	Math > Trace > Detector
Example	:SENSe1:SELected:SA:DETector:FUNCtion POS :SENSe1:SELected:SA:DETector:FUNCtion? Return :POS :SENSe:TRACe1:SA:DETector:FUNCtion AVER :SENSe1:TRACe1:SA:DETector:FUNCtion?

3.20.1.13 Auto detector mode

Command Format	:SENSe<cnum>[:SELected]:SA:DETector:AUTO <bool> :SENSe<cnum>[:SELected]:SA:DETector:AUTO? :SENSe<cnum>:TRACe<tnum>:SA:DETector:AUTO <bool> :SENSe<cnum>:TRACe<tnum>:SA:DETector:AUTO?
Instruction	Turn on or off the automatic detection mode of selected channels and traces, or read the switch status of the automatic detection mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Bool
Default	1
Menu	Math > Trace > Auto Detector
Example	:SENSe1:SELected:SA:DETector:AUTO 1 :SENSe1:SELected:SA:DETector:AUTO? Return :1 :SENSe1:TRACe1:SA:DETector:AUTO 0 :SENSe1:TRACe1:SA:DETector:AUTO? Return： 0

3.20.1.14 SA trace type

Command Format	:SENSe<cnum>[:SELected]:SA:TYPE <type> :SENSe<cnum>[:SELected]:SA:TYPE? :SENSe<cnum>:TRACe<tnum>:SA:TYPE <type> :SENSe<cnum>:TRACe<tnum>:SA:TYPE?
Instruction	Sets or gets the display mode for the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={WRITe|MAXHold|MINHold|AVERage} WRITe :puts the trace in the normal mode, updating the data. MAXHold : displays the highest measured trace value for all the data that has been measured since the function was turned on. MINHold: displays the lowest measured trace value for all the data that has been measured since the function was turned on. AVERage: averages the trace for test period.
Return	Enumeration
Default	WRITe
Menu	Math > Trace > Trace Type
Example	:SENSe1:SELected:SA:TYPE MAXHold :SENSe1:SELected:SA:TYPE? Return :MAXH :SENSe1:TRACe1:SA:TYPE MINHold :SENSe1:TRACe1:SA:TYPE? Return : MINH

3.20.1.15 SA Trace display status

Command Format	:SENSe<cnum>[:SELected]:SA:DISPlay[:STATe] <type> :SENSe<cnum>[:SELected]:SA:DISPlay[:STATe]? :SENSe<cnum>:TRACe<tnum>:SA:DISPlay[:STATe] <type> :SENSe<cnum>:TRACe<tnum>:SA:DISPlay[:STATe]?
Instruction	Sets or gets the display status of the selection channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

	<type>:={ACTI|VIEW|BLAN|BACK} ACTI : Trace is normal mode, update data VIEW: turns on the trace data so that it can be viewed on the display. BLAN : turns off the trace data so that it is not viewed on the display. BACK: turns off the display of the trace data.
Return	Enumeration
Default	ACTI
Menu	Math > Trace > State
Example	:SENSe1:SELected:SA:DISPlay:STATe VIEW :SENSe1:SELected:SA:DISPlay:STATe? Return:VIEW :SENSe1:TRACe1:SA:DISPlay:STATe ACTI :SENSe1:TRACe1:SA:DISPlay:STATe? Return:ACTI

3.20.1.16 SA trace average count

Command Format	:SENSe<cnum>[:SELected]:SA:AVERage:COUNt <numeric> :SENSe<cnum>[:SELected]:SA:AVERage:COUNt? :SENSe<cnum>:TRACe<tnum>:SA:AVERage:COUNt <numeric> :SENSe<cnum>:TRACe<tnum>:SA:AVERage:COUNt?
Instruction	Sets or gets the average number of select channels and traces.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the average number, and the parameter range: 1~1000.
Return	Int
Default	16

Menu	Math > Trace > Average Count
Example	:SENSe1:SELected:SA:AVERage:COUNt 32 :SENSe1:SELected:SA:AVERage:COUNt? Return :32 :SENSe1TRACe1:SA:AVERage:COUNt 128 :SENSe1:TRACe1:SA:AVERage:COUNt? Return :128

3.20.1.17 SA trace calculate type

Command Format	:CALCulate<cnum> [:SELected]:SA:MATH:FUNCtion <math_type> :CALCulate<cnum> [:SELected]:SA:MATH:FUNCtion? :CALCulate<cnum>:TRACe<tnum>:SA:MATH:FUNCtion <math type> :CALCulate<cnum>:TRACe<tnum>:SA:MATH:FUNCtion
Instruction	Set the calculate type of trace in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <math type>:={OFF|PDIF|PSUM|LOFF|LDIF}. OFF: Turn Off PDIF: Power Subtract PSUM: Power SUM LDIF: Log Subtract LOFF: Log Offset
Return	Enum
Default	OFF
Menu	Math > Calculate > Math
Example	:CALCulate1:SELected:SA:MATH:FUNCtion LOFF :CALCulate1:SELected:SA:MATH:FUNCtion?

	Return :LOFF :CALCulate1:TRACe1:SA:MATH:FUNCtion PSUM :CALCulate1:TRACe1:SA:MATH:FUNCtion? Return:PSUM

3.20.1.18 Input X trace calculate

Command Format	:CALCulate<cnum> [:SELected]:SA:MATH:X <xnum> :CALCulate<cnum> [:SELected]:SA:MATH:X? :CALCulate<cnum>:TRACe<tnum>:SA:MATH:X <xnum> :CALCulate<cnum>:TRACe<tnum>:SA:MATH:X?
Instruction	Set the input X trace for trace calculate in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <xnum>:={[0]-256}, represents the math calculate input X trace.
Return	Integer
Default	0
Menu	Math > Calculate > Select X
Example	:CALCulate1:SELected:SA:MATH:X 3 :CALCulate1:SELected:SA:MATH:X? Return :3 :CALCulate1:TRACe1:SA:MATH:X 2 :CALCulate1:TRACe1:SA:MATH:X? Return:2

3.20.1.19 Input Y trace calculate

Command Format	:CALCulate<cnum> [:SELected]:SA:MATH:Y <ynum> :CALCulate<cnum> [:SELected]:SA:MATH:Y? :CALCulate<cnum>:TRACe<tnum>:SA:MATH:Y <ynum> :CALCulate<cnum>:TRACe<tnum>:SA:MATH:Y?
Instruction	Set the input Y trace for trace calculate in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <xnum>:={[0]-256}, represents the math calculate input Y trace.
Return	Integer
Default	0
Menu	Math > Calculate > Select Y
Example	:CALCulate1:SELected:SA:MATH:Y 3 :CALCulate1:SELected:SA:MATH:Y? Return :3 :CALCulate1:TRACe1:SA:MATH:Y 2 :CALCulate1:TRACe1:SA:MATH:Y? Return:2

3.20.1.20 Log offset of trace calculate

Command Format	:CALCulate<cnum> [:SELected]:SA:MATH:OFFSet <offset> :CALCulate<cnum> [:SELected]:SA:MATH:OFFSet? :CALCulate<cnum>:TRACe<tnum>:SA:MATH:OFFSet < offset > :CALCulate<cnum>:TRACe<tnum>:SA:MATH:OFFSet?

Instruction	Set the log offset of trace calculate in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <offset>:=[-100,100], represents the trace log offset.
Return	Float
Default	0
Menu	Math > Calculate > offset
Example	:CALCulate1:SELected:SA:MATH:OFFSet 50 :CALCulate1:SELected:SA:MATH:OFFSet? Return :50 :CALCulate1:TRACe1:SA:MATH:OFFSet 53.4 :CALCulate1:TRACe1:SA:MATH:OFFSet? Return:53.4

3.20.1.21 Reference level for log subtract

Command Format	:CALCulate<cnum> [:SELected]:SA:MATH:REFerence <ref> :CALCulate<cnum> [:SELected]:SA:MATH:REFerence? :CALCulate<cnum>:TRACe<tnum>:SA:MATH:REFerence < ref> :CALCulate<cnum>:TRACe<tnum>:SA:MATH:REFerence?
Instruction	Set the reference level for logarithmic subtraction of trace operations in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <offset>:=[-100,100], represents the reference level for log subtract.
Return	Float

Default	0
Menu	Math > Calculate > ref
Example	:CALCulate1:SELected:SA:MATH:REFerence 100 :CALCulate1:SELected:SA:MATH:REFerence? Return :100 :CALCulate1:TRACe1:SA:MATH:REFerence 20.5 :CALCulate1:TRACe1:SA:MATH:REFerence? Return:20.5

3.20.1.22 Enable state for correction

Command Format	:SENSe<cnum> [:SELected]:SA:CORRections [:STATe] <enable> :SENSe<cnum> [:SELected]:SA:CORRections [:STATe]? :SENSe<cnum>:TRACe<tnum>:SA:CORRections [:STATe] < enable > :SENSe<cnum>:TRACe<tnum>:SA:CORRections [:STATe]?
Instruction	Set enable state for correction function in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <enable>:= ON|OFF|1|0.
Return	Boolean (1=ON,0=OFF)
Default	0
Menu	Scale > Corrections > Corrections Enable
Example	:SENSe1:SELected:SA:CORRections:STATe ON :SENSe1:SELected:SA:CORRections:STATe? Return :1 :SENSe1:TRACe1:SA:CORRections:STATe OFF

	:SENSe1:TRACe1:SA:CORRections:STATe? Return:0

3.20.1.23 Enable state for sub correction

Command Format	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>.[:STATe] <enable> :SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum> [:STATe]? :SENSe<cnum>:TRACe<tnum>:SA:CORRections:CSET<rnum> [:STATe] <enable> :SENSe<cnum>:TRACe<tnum>:SA:CORRections:CSET<rnum> [:STATe]?
Instruction	Set enable state for sub correction function in SA mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <rnum>:={[1]-6}, represents the selected sub correction. <enable>:= ON|OFF|1|0.
Return	Boolean (1=ON,0=OFF)
Default	0
Menu	Scale > Corrections > Corr Enable
Example	:SENSe1:SELected:SA:CORRections:CSET1:STATe ON :SENSe1:SELected:SA:CORRections:CSET1:STATe? Return :1 :SENSe1:TRACe1:SA:CORRections:CSET1:STATe OFF :SENSe1:TRACe1:SA:CORRections:CSET1:STATe? Return:0

3.20.1.24 Add correction items

Command Format	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:ADD<freq> <value> :SENSe<cnum>:TRACe<tnum>:SA:CORRections:CSET<rnum>:ADD<freq> <value>
Instruction	Add correction items to the sub correction table.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <rnum>:={[1]-6}, represents the selected sub correction. <freq>: set frequency value. <value>: set correction value.
Return	None.
Default	None.
Menu	Scale > Corrections > Edit Correction
Example	:SENSe1:SELected:SA:CORRections:CSET1:ADD 9000000,10 :SENSe1:TRACe1:SA:CORRections:CSET1:ADD 90000,10

3.20.1.25 Delete the correction item

Command Format	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:POINt:DELete <point> :SENSe<cnum>:TRACe<tnum>:SA:CORRections:CSET<rnum>:POINt:DELete <point>
Instruction	Delete the correction items in the sub correction.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <rnum>:={[1]-6}, represents the selected sub correction. <point>: represents the correction item, start from 0.
Return	None.
Default	None.

Menu	Scale > Corrections > Edit Correction
Example	:SENSe1:SELected:SA:CORRections:CSET1:POINt:DELete 3 :SENSe1:TRACe1:SA:CORRections:CSET1:POINt:DELete 2

3.20.1.26 Delete all the correction items

Command Format	:SENSe<cnum> [:SELected]:SA:CORRections:CSET<rnum>:DELete :SENSe<cnum>:TRACe<tnum>:SA:CORRections:CSET<rnum>:DELete
Instruction	Delete all the correction items in the sub correction.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <rnum>:={[1]-6}, represents the selected sub correction.
Return	None.
Default	None.
Menu	Scale > Corrections > Edit Correction
Example	:SENSe1:SELected:SA:CORRections:CSET1:DELete :SENSe1:TRACe1:SA:CORRections:CSET1:DELete

3.20.2 Channel Power

3.20.2.1 Command List

The integration BW	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower:BWIDth:INTegration
The span power of the channel power	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower:FREQuency:SPAN:POWer
Main channel power and power density	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower?

Main channel power	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower:CHPower?
Main channel power density	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower:DENSity?

3.20.2.2 The integration BW

Command Format	:CALCulate<cnum>[:SELected]:SA:CHPower:BWIDth:INTegration <numeric> :CALCulate<cnum>[:SELected]:SA:CHPower:BWIDth:INTegration? :CALCulate<cnum>:TRACe<tnum>:SA:CHPower:BWIDth:INTegration <numeric> :CALCulate<cnum>:TRACe<tnum>:SA:CHPower:BWIDth:INTegration?
Instruction	Sets or gets the integral bandwidth of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the integral bandwidth, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	2MHz
Menu	Meas > Channel Power > Meas Setup > Integration BW
Example	:CALCulate1:SELected:SA:CHPower:BWIDth:INTegration 1e9 :CALCulate1:SELected:SA:CHPower:BWIDth:INTegration? Return:1000000000 :CALCulate1:TRACe1:SA:CHPower:BWIDth:INTegration 2e9 :CALCulate1:TRACe1:SA:CHPower:BWIDth:INTegration? Return:2000000000

3.20.2.3 The span power of the channel power

Command Format	:CALCulate<cnum>[:SELected]:SA:CHPower:FREQuency:SPAN:POWer :CALCulate<cnum>:TRACe<tnum>:SA:CHPower:FREQuency:SPAN:POWer
Instruction	Sets the analyzer span of the selected channel and trace for the channel power measurement. Be sure the span is set larger than the integration bandwidth.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	Meas > Channel Power > Meas Setup > Span Power
Example	:CALCulate1:SELected:SA:CHPower:FREQuency:SPAN:POWer :CALCulate1:TRACe1:SA:CHPower:FREQuency:SPAN:POWer

3.20.2.4 Main channel power and power density

Command Format	:CALCulate<cnum>[:SELected]:SA:CHPower? :CALCulate<cnum>:TRACe<tnum>:SA:CHPower?
Instruction	Gets scalar results of main channel power and power density of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, Channel Power unit: dBm Float, Density unit: dBm/Hz

Default	None
Menu	Meas > Channel Power
Example	:CALCulate1:SELected:SA:CHPower? Return: -32.3329235931259,-125.343223549766 :CALCulate1:TRACe1:SA:CHPower? Return: -32.3329235931259,-125.343223549766

3.20.2.5 Main channel power

Command Format	:CALCulate<cnum>[:SELected]:SA:CHPower:CHPower? :CALCulate<cnum>:TRACe<tnum>:SA:CHPower:CHPower?
Instruction	Gets scalar results of main channel power of the selected channel and trace
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, Channel Power unit: dBm
Default	None
Menu	Meas > Channel Power
Example	:CALCulate1:SELected:SA:CHPower:CHPower? Return：-32.0712381021238 :CALCulate1:TRACe1:SA:CHPower:CHPower? Return：-32.0712381021238

3.20.2.6 Main channel power density

Command Format	:CALCulate<cnum>[:SELected]:SA:CHPower:DENSity?

	:CALCulate<cnum>:TRACe<tnum>:SA:CHPower:DENSity?
Instruction	Gets scalar results of main channel power density of the selected channel and trace
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, Density unit: dBm/Hz
Default	None
Menu	Meas > Channel Power
Example	:CALCulate1:SELected:SA:CHPower:DENSity? Return: -125.096780027723 :CALCulate1:TRACe1:SA:CHPower:DENSity? Return: -125.096780027723

3.20.3 ACPR

3.20.3.1 Command List

ACPR main channel bandwidth	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:BWIDth:INTegration
ACPR Adjacent channel bw	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet:BWIDth[:INTegration]
ACPR Adjacent channel space	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet[:FREQuency]
ACPR main channel power	:CALCulate<cnum>[:SELected]:SA:ACPRatio:MAIN?
ACPR lower adjacent channel power ratio	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:LOWer?
ACPR lower adjacent channel power	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:LOWer:POWer?
ACPR upper adjacent channel power ratio	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:UPPer?

ACPR upper adjacent channel power	:CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:UPPer:POWer?

3.20.3.2 ACPR main channel bandwidth

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:BWIDth:INTegration <numeric> :CALCulate<cnum>[:SELected]:SA:ACPRatio:BWIDth:INTegration? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:BWIDth:INTegration <numeric> :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:BWIDth:INTegration?
Instruction	Sets or gets the main channel bandwidth measured by ACPR for the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the main channel bandwidth, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	1MHz
Menu	Meas > ACPR > Meas Setup > Main Channel
Example	:CALCulate1:SELected:SA:ACPRatio:BWIDth:INTegration 1e9 :CALCulate1:SELected:SA:ACPRatio:BWIDth:INTegration? Return: 1000000000 :CALCulate1:TRACe1:SA:ACPRatio:BWIDth:INTegration 2e9 :CALCulate1:TRACe1:SA:ACPRatio:BWIDth:INTegration? Return: 2000000000

3.20.3.3 ACPR Adjacent channel bw

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:OFFSet:BWIDth[:INTegration] <numeric> :CALCulate<cnum>[:SELected]:SA:ACPRatio:OFFSet:BWIDth[:INTegration]? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet:BWIDth[:INTegration] <numeric> :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet:BWIDth[:INTegration]?
Instruction	Sets or gets the selected channel and trace's Adjacent channel bandwidth of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Adjacent channel bandwidth, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	1MHz
Menu	Meas > ACPR > Meas Setup > Adjacent Chn
Example	:CALCulate1:SELected:SA:ACPRatio:OFFSet:BWIDth:INTegration 5e6 :CALCulate1:SELected:SA:ACPRatio:OFFSet:BWIDth:INTegration? Return :5000000 :CALCulate1:TRACe1:SA:ACPRatio:OFFSet:BWIDth:INTegration 3e6 :CALCulate1:TRACe1:SA:ACPRatio:OFFSet:BWIDth:INTegration? Return :3000000

3.20.3.4 ACPR Adjacent channel space

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:OFFSet[:FREQuency] <numeric>

	:CALCulate<cnum>[:SELected]:SA:ACPRatio:OFFSet[:FREQuency] :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet[:FREQuency] <numeric> :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:OFFSet[:FREQuency]?
Instruction	Sets or gets the selected channel and trace's Adjacent channel space of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the Adjacent channel space, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	3MHz
Menu	Meas > ACPR > Meas Setup > Adj Chn Space
Example	:CALCulate1:SELected:SA:ACPRatio:OFFSet:FREQuency 2e6 :CALCulate1:SELected:SA:ACPRatio:OFFSet:FREQuency? Return: 2000000 :CALCulate1:TRACe1:SA:ACPRatio:OFFSet:FREQuency 1e6 :CALCulate1:TRACe1:SA:ACPRatio:OFFSet:FREQuency? Return: 1000000

3.20.3.5 ACPR main channel power

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:MAIN? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:MAIN?
Instruction	Gets the selected channel and trace's main channel power of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1.

	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: dBm
Default	None
Menu	Meas > ACPR
Example	:CALCulate1:SELected:SA:ACPRatio:MAIN? Return : -66.460503383216 :CALCulate1:TRACe1:SA:ACPRatio:MAIN? Return : -64.8677896852216

3.20.3.6 ACPR lower adjacent channel power ratio

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:LOWer? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:LOWer?
Instruction	Gets the selected channel and trace's lower adjacent channel power ratio of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: dBc
Default	None
Menu	Meas > ACPR
Example	:CALCulate1:SELected:SA:ACPRatio:LOWer? Return : -20.6055355636683 :CALCulate1:TRACe1:SA:ACPRatio:LOWer? Return : -21.1571905607897

3.20.3.7 ACPR lower adjacent channel power

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:LOWer:POWer? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:LOWer:POWer?
Instruction	Gets the selected channel and trace's lower adjacent channel power of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: dBm
Default	None
Menu	Meas > ACPR
Example	:CALCulate1:SELected:SA:ACPRatio:LOWer:POWer? Return : -46.0127403678039 :CALCulate1:TRACe1:SA:ACPRatio:LOWer:POWer? Return : -46.8181475071255

3.20.3.8 ACPR upper adjacent channel power ratio

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:UPPer? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:UPPer?
Instruction	Gets the selected channel and trace's upper adjacent channel power ratio of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: dBc
Default	None
Menu	Meas > ACPR

Example	:CALCulate1:SELected:SA:ACPRatio:UPPer? Return : -18.6108514488295 :CALCulate1:TRACe1:SA:ACPRatio:UPPer? Return : -21.3324563909162

3.20.3.9 ACPR upper adjacent channel power

Command Format	:CALCulate<cnum>[:SELected]:SA:ACPRatio:UPPer:POWer? :CALCulate<cnum>:TRACe<tnum>:SA:ACPRatio:UPPer:POWer?
Instruction	Gets the selected channel and trace's upper adjacent channel power of ACPR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: dBm
Default	None
Menu	Meas > ACPR
Example	:CALCulate1:SELected:SA:ACPRatio:UPPer:POWer? Return : -45.5211570718928 :CALCulate1:TRACe1:SA:ACPRatio:UPPer:POWer? Return： -45.9642491121815

3.20.4 Occupied BW

3.20.4.1 Command List

OBW percentage of signal power	:CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:PERCent
OBW bandwidth and bandwidth	:CALCulate<cnum>:TRACe<tnum>:SA:OBWidth?

centroid	
OBW bandwidth	:CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:OBWidth?
OBW bandwidth centroid	:CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:CENTroid?
OBW Transmit Freq Error	:CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:FERRor?

3.20.4.2 OBW percentage of signal power

Command Format	:CALCulate<cnum>[:SELected]:SA:OBWidth:PERCent <numeric> :CALCulate<cnum>[:SELected]:SA:OBWidth:PERCent? :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:PERCent <numeric> :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:PERCent?
Instruction	Sets or gets the selected channel and trace's percentage of signal power of OBW measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the percentage of signal power, and the parameter range: 10~100.
Return	Float
Default	99
Menu	Meas > Occupied BW > Meas Setup > Occ BW Percent
Example	:CALCulate1:SELected:SA:OBWidth:PERCent 60 :CALCulate1:SELected:SA:OBWidth:PERCent? Return :60 :CALCulate1:TRACe1:SA:OBWidth:PERCent 30 :CALCulate1:TRACe1:SA:OBWidth:PERCent? Return :30

3.20.4.3 OBW bandwidth and bandwidth centroid

Command Format	:CALCulate<cnum>[:SELected]:SA:OBWidth? :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth?
Instruction	Gets the selected channel and trace's occupied bandwidth and bandwidth centroid of OBW measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: Hz
Default	None
Menu	Meas > Occupied BW
Example	:CALCulate1:SELected:SA:OBWidth? Return : 28580644.0096836,4249777822.00484 :CALCulate1:TRACe1:SA:OBWidth? Return : 26997375.076252,4255988812.46187

3.20.4.4 OBW bandwidth

Command Format	:CALCulate<cnum>[:SELected]:SA:OBWidth:OBWidth? :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:OBWidth?
Instruction	Gets the selected channel and trace's occupied bandwidth of OBW measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: Hz
Default	None

Menu	Meas > Occupied BW
Example	:CALCulate1:SELected:SA:OBWidth:OBWidth? Return : 26715503.1180305 :CALCulate1:TRACe1:SA:OBWidth:OBWidth? Return : 26997375.076252

3.20.4.5 OBW bandwidth centroid

Command Format	:CALCulate<cnum>[:SELected]:SA:OBWidth:CENTroid? :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:CENTroid?
Instruction	Gets the selected channel and trace's occupied bandwidth centroid of OBW measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: Hz
Default	None
Menu	Meas > Occupied BW
Example	:CALCulate1:SELected:SA:OBWidth:CENTroid? Return : 4241182953.86024 :CALCulate1:TRACe1:SA:OBWidth:CENTroid? Return： 4252382501.60254

3.20.4.6 OBW Transmit Freq Error

Command Format	:CALCulate<cnum>[:SELected]:SA:OBWidth:FERRor? :CALCulate<cnum>:TRACe<tnum>:SA:OBWidth:FERRor?

Instruction	Gets the selected channel and trace's transmit frequency error of OBW measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: Hz
Default	None
Menu	Meas > Occupied BW
Example	:CALCulate1:SELected:SA:OBWidth:FERRor? Return : 4223880936.89468 :CALCulate1:TRACe1:SA:OBWidth:FERRor? Return : -46483.4618330002

3.20.5 TOI

3.20.5.1 Command List

Read the measurement results of TOI	:CALCulate<cnum>:TRACe<tnum>:SA:TOI?
Read the smaller value of TOI	:CALCulate<tnum>:TRACe<tnum>:SA:TOI:IP3?

3.20.5.2 Read the measurement results of TOI

Command Format	:CALCulate<cnum> [:SELected]:SA:TOI? :CALCulate<cnum>:TRACe<tnum>:SA:TOI?
Instruction	Read the measurement results of third-order intermodulation distortion Returns the following values separated by commas in scientific count form: Lower Tone frequency (Hz), amplitude, Upper Tone frequency (Hz), amplitude,

	TOI(Lower 3rd) frequency (Hz), amplitude, third-order intermodulation cutoff (Intercept), High frequency TOI(Upper 3rd) frequency (Hz), amplitude, third-order intermodulation cut-off point (Intercept)
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float
Default	None
Menu	Meas > Meas >TOI
Example	:CALCulate1:TRACe1:SA:TOI?

3.20.5.3 Read the smaller value of TOI

Command Format	:CALCulate<tnum>[:SELected]:SA:TOI:IP3? :CALCulate<tnum>:TRACe<tnum>:SA:TOI:IP3?
Instruction	Read the smaller value in the third-order intermodulation cutoff (Intercept) of low frequency TOI(Lower 3rd) and high frequency TOI(Upper 3rd)
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float
Default	None
Menu	Meas > Meas >TOI
Example	:CALCulate1:SELected:SA:TOI:IP3? Return -78.2445026767116

3.20.6 CNR

3.20.6.1 Command List

CNR Carrier BandWidth	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:CARRier:BWIDth
CNR Noise BandWidth	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:NOISe:BWIDth
CNR Frequence Offset	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:OFFSet[:FREQuency]
CNR Carrier Power	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:CARRier:POWer?
CNR Noise Power	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:NOISe:POWer?
CNR Carrier Noise Ratio	:CALCulate<cnum>:TRACe<tnum>:SA:CNRatio?

3.20.6.2 CNR Carrier BandWidth

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio:CARRier:BWIDth <freq> :CALCulate<cnum>[:SELected]:SA:CNRatio:CARRier:BWIDth? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:CARRier:BWIDth <freq> :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:CARRier:BWIDth?
Instruction	Sets or gets the CNR carrier bandwidth of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <freq> :represents the carrier bandwidth, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	2MHz
Menu	Meas > Meas > CNR > Meas Setup > Carrier BandWidth
Example	:CALCulate1:SELected:SA:CNRatio:CARRier:BWIDth 1e6 :CALCulate1:SELected:SA:CNRatio:CARRier:BWIDth?

	Return: 1000000 :CALCulate1:TRACe1:SA:CNRatio:CARRier:BWIDth 2e6 :CALCulate1:TRACe1:SA:CNRatio:CARRier:BWIDth? Return: 2000000

3.20.6.3 CNR Noise BandWidth

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio:NOISe:BWIDth <freq> :CALCulate<cnum>[:SELected]:SA:CNRatio:NOISe:BWIDth? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:NOISe:BWIDth <freq> :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:NOISe:BWIDth?
Instruction	Sets or gets the CNR noise bandwidth of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <freq>:represents the noise bandwidth, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	2MHz
Menu	Meas > Meas > CNR > Meas Setup > Noise BandWidth
Example	:CALCulate1:SELected:SA:CNRatio:NOISe:BWIDth 1e6 :CALCulate1:SELected:SA:CNRatio:NOISe:BWIDth? Return: 1000000 :CALCulate1:TRACe1:SA:CNRatio:NOISe:BWIDth 2e6 :CALCulate1:TRACe1:SA:CNRatio:NOISe:BWIDth? Return: 2000000

3.20.6.4 CNR Frequence Offset

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio:OFFSet[:FREQuency] <freq> :CALCulate<cnum>[:SELected]:SA:CNRatio:OFFSet[:FREQuency]? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:OFFSet[:FREQuency] <freq> :CALCulate<cnum>:TRACe<tnum>SA:CNRatio:OFFSet[:FREQuency]?
Instruction	Sets or gets the CNR frequency offset of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <freq>:represents the frequency offset value, and the parameter range: 0 Hz to maximum frequency of the analyzer.
Return	Float, unit: Hz
Default	3MHz
Menu	Meas > Meas > CNR > Meas Setup > Frequence Offset
Example	:CALCulate1:SELected:SA:CNRatio:OFFSet:FREQuency 1e6 :CALCulate1:SELected:SA:CNRatio:OFFSet:FREQuency? Return: 1000000 :CALCulate1:TRACe1:SA:CNRatio:OFFSet:FREQuency 2e6 :CALCulate1:TRACe1:SA:CNRatio:OFFSet:FREQuency? Return: 2000000

3.20.6.5 CNR Carrier Power

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio:CARRier:POWer? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:CARRier:POWer?
Instruction	Gets the CNR carrier power of the selected channel and trace.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float unit: dBm
Default	None
Menu	Meas > Meas > CNR > Carrier Power
Example	:CALCulate1:SELected:SA:CNRatio:CARRier:POWer? Return: -65.4299219695216

3.20.6.6 CNR Noise Power

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio:NOISe:POWer? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio:NOISe:POWer?
Instruction	Gets the CNR noise power of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float unit: dBm
Default	None
Menu	Meas > Meas > CNR > Noise Power
Example	:CALCulate1:SELected:SA:CNRatio:NOISe:POWer? Return: -65.321863719616 :CALCulate1:TRACe1:SA:CNRatio:NOISe:POWer? Return: -65.1136055327616

3.20.6.7 CNR Carrier Noise Ratio

Command Format	:CALCulate<cnum>[:SELected]:SA:CNRatio? :CALCulate<cnum>:TRACe<tnum>:SA:CNRatio?
Instruction	Gets the CNR noise ratio of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float unit: dBm
Default	None
Menu	Meas > Meas > CNR > Carrier Noise Ratio
Example	:CALCulate1:SELected:SA:CNRatio? Return: 0.11582133533318 :CALCulate1:TRACe1:SA:CNRatio? Return: -0.220832697601324

3.20.7 Spectrum Monitor

3.20.7.1 Command List

Monitor Length	:CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:SHOWlength
Monitor Restart	:CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:RESTart
Spectrum Monitor state	:CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:PAUSe

3.20.7.2 Monitor Length

Command Format	:CALCulate<cnum>[:SELected]:SA:SPECtrogram:SHOWlength <num> :CALCulate<cnum>[:SELected]:SA:SPECtrogram:SHOWlength? :CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:SHOWlength

	<num> :CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:SHOWlength?
Instruction	Sets or gets the spectrum monitor length of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <num>:=An integer in the range of [10,800]
Return	Integer
Default	175
Menu	Meas > Meas > Spectrum Monitor > Meas Setup > Monitor Length
Example	:CALCulate1:SELected:SA:SPECtrogram:SHOWlength 200 :CALCulate1:SELected:SA:SPECtrogram:SHOWlength? Return: 200 :CALCulate1:TRACe1:SA:SPECtrogram:SHOWlength 300 :CALCulate1:TRACe1:SA:SPECtrogram:SHOWlength? Return: 300

3.20.7.3 Monitor Restart

Command Format	:CALCulate<cnum>[:SELected]:SA:SPECtrogram:RESTart :CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:RESTart
Instruction	Sets the monitor restart of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None

Menu	Meas > Meas > Spectrum Monitor > Meas Setup > Restart
Example	:CALCulate1:SELected:SA:SPECtrogram:RESTart :CALCulate1:TRACe1:SA:SPECtrogram:RESTart

3.20.7.4 Spectrum Monitor state

Command Format	:CALCulate<cnum>[:SELected]:SA:SPECtrogram:PAUSe <bool> :CALCulate<cnum>[:SELected]:SA:SPECtrogram:PAUSe? :CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:PAUSe <bool> :CALCulate<cnum>:TRACe<tnum>:SA:SPECtrogram:PAUSe?
Instruction	Sets or gets the spectrum monitor state of the selected channel and trace.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Meas > Meas > Spectrum Monitor > Meas Setup > Spectrum Monitor
Example	:CALCulate1:SELected:SA:SPECtrogram:PAUSe 1 :CALCulate1:SELected:SA:SPECtrogram:PAUSe? Return: 1 :CALCulate1:TRACe1:SA:SPECtrogram:PAUSe 0 :CALCulate1:TRACe1:SA:SPECtrogram:PAUSe? Return: 0

3.20.8 SA Source

3.20.8.1 Command List

SA Source State	:SENSe<cnum>:SA:SOURce<pnum>:STATe
SA Source sweep type	:SENSe<cnum>:SA:SOURce<pnum>:SWEep:TYPE
SA Source CW frequency	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:CW
SA Source start frequency	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STARt
SA Source stop frequency	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STOP
SA Source output power	:SENSe<cnum>:SA:SOURce<pnum>:POWer:VALue
SA Source start power	:SENSe<cnum>:SA:SOURce<pnum>:POWer:STARt
SA Source stop power	:SENSe<cnum>:SA:SOURce<pnum>:POWer:STOP

3.20.8.2 SA Source State

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:STATe <bool> :SENSe<cnum>:SA:SOURce<pnum>:STATe?
Instruction	Sets / reads the ON/OFF state of the source.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > SA Setup… > Source > State
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:STATe 1 :SENSe1:SA:SOURce1:STATe? Return: 1

3.20.8.3 SA Source sweep type

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:SWEep:TYPE <type>

	:SENSe<cnum>:SA:SOURce<pnum>:SWEep:TYPE?
Instruction	Set and read the source sweep type.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <type>:={CW|LIN|POW|LFP}
Return	Enumeration
Default	CW
Menu	Sweep > SA Setup… > Source > Type > Sweep Type
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE LIN :SENSe1:SA:SOURce1:SWEep:TYPE? Return: LIN

3.20.8.4 SA Source CW frequency

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:CW <numeric> :SENSe<cnum>:SA:SOURce<pnum>:FREQuency:CW?
Instruction	Set and read the source CW frequency.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the CW frequency.
Return	Float, unit is Hz
Default	1000000000
Menu	Sweep > SA Setup… > Source > Frequency > CW Frequency
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:FREQuency:CW 500000 :SENSe1:SA:SOURce1:FREQuency:CW? Return: 500000

3.20.8.5 SA Source start frequency

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STARt <numeric> :SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STARt?
Instruction	Set and read the source start frequency. This command applies to Linear Freq or LinFreq+Power sweep types.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the start frequency.
Return	Float, unit is Hz
Default	500000000
Menu	Sweep > SA Setup… > Source > Frequency > Start Frequency
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE LIN :SENSe1:SA:SOURce1:FREQuency:STARt 600000 :SENSe1:SA:SOURce1:FREQuency:STARt? Return: 600000

3.20.8.6 SA Source stop frequency

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STOP <numeric> :SENSe<cnum>:SA:SOURce<pnum>:FREQuency:STOP?
Instruction	Set and read the source stop frequency. This command applies to Linear Freq or LinFreq+Power sweep types.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the stop frequency.

Return	Float, unit is Hz
Default	500000000
Menu	Sweep > SA Setup… > Source > Frequency > Stop Frequency
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE LIN :SENSe1:SA:SOURce1:FREQuency:STOP 900000 :SENSe1:SA:SOURce1:FREQuency:STOP? Return: 900000

3.20.8.7 SA Source output power

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:POWer:VALue <numeric> :SENSe<cnum>:SA:SOURce<pnum>:POWer:VALue?
Instruction	Set and read the source output power level. This command applies to CW or LINear sweep types.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the output power level, and the parameter range: -55~20 dBm.
Return	Float
Default	0
Menu	Sweep > SA Setup… > Source > Power > Power Level
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE CW :SENSe1:SA:SOURce1:POWer:VALue -5 :SENSe1:SA:SOURce1:POWer:VALue? Return: -5

3.20.8.8 SA Source start power

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:POWer:STARt <numeric> :SENSe<cnum>:SA:SOURce<pnum>:POWer:STARt?
Instruction	Set and read the source start power level. This command applies to Power or LFPower sweep types.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the start power level, and the parameter range: -55~20 dBm.
Return	Float
Default	-10
Menu	Sweep > SA Setup… > Source > Power > Start Power
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE POW :SENSe1:SA:SOURce1:POWer:STARt -7 :SENSe1:SA:SOURce1:POWer:STARt? Return: -7

3.20.8.9 SA Source stop power

Command Format	:SENSe<cnum>:SA:SOURce<pnum>:POWer:STOP <numeric> :SENSe<cnum>:SA:SOURce<pnum>:POWer:STOP?
Instruction	Set and read the source stop power level. This command applies to Power or LFPower sweep types.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <pnum>:={[1]-4}, specifies the measurement port number. <numeric>:represents the stop power level, and the parameter range: -55~20 dBm.
Return	Float

Default	0
Menu	Sweep > SA Setup… > Source > Power > Stop Power
Example	:CALCulate1:CUSTom:DEFine "SA" :SENSe1:SA:SOURce1:SWEep:TYPE POW :SENSe1:SA:SOURce1:POWer:STOP 2 :SENSe1:SA:SOURce1:POWer:STOP? Return: 2

3.21 MIXER Commands(Option, SHN900A series models do not support)

3.21.1 Mixer measure sweep setup

3.21.1.1 Command List

Mixer Setup apply	:SENSe<cnum>:MIXer:APPLy
Mixer Frequency Calculates	:SENSe<cnum>:MIXer:CALCulate
Previously-saved Mixer Setup	:SENSe<cnum>:MIXer:DISCard
Load Mixer File	:SENSe<cnum>:MIXer:LOAD
Save Mixer Setting	:SENSe<cnum>:MIXer:SAVE
Noise suppression state	:SENSe<cnum>:MIXer:AVOidspurs
DUT Port Map	:SENSe<cnum>:MIXer:PMAP
DUT Input Port Query	:SENSe<cnum>:MIXer:PMAP:INPut?
DUT Output Port Query	:SENSe<cnum>:MIXer:PMAP:OUTPut?
Mixer Recalculate	:SENSe<cnum>:MIXer:RECalculate
X-axis display type	:SENSe<cnum>:TRACe<tnum>:MIXer:XAXis <type>
Add Segments to Mixer	:SENSe<cnum>:MIXer:SEGMent<segnum>:ADD
Segment State	:SENSe<cnum>:MIXer:SEGMent<segnum>:STATe
Segment Number of	:SENSe<cnum>:MIXer:SEGMent:COUNt?

Mixer	
Delete Segments from Mixer	:SENSe<cnum>:MIXer:SEGMent<segnum>:DELete
Clear Segments Table of Mixer	:SENSe<cnum>:MIXer:SEGMent:DELete:ALL
Segment Frequency Calculates	:SENSe<cnum>:MIXer:SEGMent<segnum>:CALCulate
Segment Input Sweep Mode	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:MODE
Segment Input Fixed Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:FIXed
Segment Input Start Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STARt
Segment Input Stop Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STOP
Segment Input Power	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:POWer
Segment LO Sweep Mode	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:MODE
Mixer LO Fixed Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:FIXed
Segment LO Start Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STARt
Segment LO Stop Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STOP
Segment LO Frequency State	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:ILTI
Segment LO Power	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:POWer
Segment Output Sweep Mode	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:MODE
Segment Output Fixed Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:FIXed
Segment Output Start Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STARt
Segment Output Stop Frequency	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STOP

Segment Output Frequency Calculate Method	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:SIDeband
Segment Output Power	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:POWer
Segment Sweep Points Number	:SENSe<cnum>:MIXer:SEGMent<segnum>:POINts
Segment IF Bandwidth	:SENSe<cnum>:MIXer:SEGMent<segnum>:BWIDth

3.21.1.2 Mixer Setup apply

Command Format	:SENSe<cnum>:MIXer:APPLy
Instruction	This command applies the mixer setup settings and turns the channel ON.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Apply
Example	:SENS:MIX:APPL

3.21.1.3 Mixer Frequency Calculates

Command Format	:SENSe<cnum>:MIXer:CALCulate <type>
Instruction	This command calculates the Input, IF, or Output frequencies of the mixer setup.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={INPut|OUTPut|LO}, represents Mixer port to be calculated.
Return	None
Default	None

Menu	Sweep > Mixer Measure... > Mixer Frequency > Calc
Example	:SENS:MIX:CALC Output

3.21.1.4 Previously-saved Mixer Setup

Command Format	:SENSe<cnum>:MIXer:DISCard
Instruction	This command cancels changes that have been made to the Converter setup and reverts to the previously-saved setup. Same as the Cancel button on the mixer setup dialog box.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Cancel
Example	:SENS:MIX:DISC

3.21.1.5 Load Mixer File

Command Format	:SENSe<cnum>:MIXer:LOAD <string>
Instruction	This command loads a previously-configured mixer attributes file (.mxr)
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <string>: represents path and file name (including .mxr extension) to load.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Load…
Example	:SENS:MIXer:LOAD "local/file.mxr"

3.21.1.6 Save Mixer Setting

Command Format	:SENSe<cnum>:MIXer:SAVE <string>
Instruction	This command saves the settings for the mixer/converter test setup to a mixer attributes file.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <string>: represents path and file name (including .mxr extension) to save..
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Save…
Example	:SENS:MIXer:SAVE "local/file.mxr"

3.21.1.7 Noise suppression state

Command Format	:SENSe<cnum>:MIXer:AVOidspurs <bool> :SENSe<cnum>:MIXer:AVOidspurs?
Instruction	Set or obtain the state of noise suppression.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean (1=ON,0=OFF)
Default	OFF
Menu	Cal > Mixer Cal > Avoid Spur
Example	:SENS:MIX:AVO ON :SENS:MIX:AVO? Return: 1

3.21.1.8 DUT Port Map

Command Format	:SENSe<cnum>:MIXer:PMAP <pnum1>,<pnum2>
Instruction	This command sets the VNA to DUT port map for FCA measurements.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <pnum1>:={1~2}, SNA port to connect to the DUT input. <pnum2>:={1~2}, SNA port to connect to the DUT output.
Return	None
Default	1,2
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIX:PMAP 2,1

3.21.1.9 DUT Input Port Query

Command Format	:SENSe<cnum>:MIXer:PMAP:INPut?
Instruction	This command gets the SNA port that is mapped to the DUT input.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer. Input port number.
Default	1
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIXer:PMAP:INPut? Return: 1

3.21.1.10 DUT Output Port Query

Command Format	:SENSe<cnum>:MIXer:PMAP:OUTPut?
Instruction	This command gets the SNA port that is mapped to the DUT output.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer. Output port number.
Default	2
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIXer:PMAP:OUTPut? Return: 2

3.21.1.11 Mixer Recalculate

Command Format	:SENSe<cnum>:MIXer:RECalculate
Instruction	This command repeats the last calculation that was performed.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None
Menu	None
Example	:SENS:MIXer:RECalculate

3.21.1.12 X-axis display type

Command Format	:SENSe<cnum>[:SELected]:MIXer:XAXis <type> :SENSe<cnum>[:SELected]:MIXer: XAXis? :SENSe<cnum>:TRACe<tnum>:MIXer:XAXis <type> :SENSe<cnum>:TRACe<tnum>:MIXer: XAXis?
Instruction	Set or obtain the X-axis display type when measuring the mixer, vector mixing is not allowed to be set.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not

	specified, <tnum> defaults to 1. <type>:={INPUT|LO|OUTPUT}. INPut: Mixer Input port. LO: Mixer LO port. OUTPut: Mixer Output port.
Return	String
Default	INPut
Menu	Sweep > X-Axis Type
Example	:SENS:MIX:XAX INPut :SENSe:MIXer:XAXis? Return: INPUT

3.21.1.13 Add Segments to Mixer

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:ADD <numeric>
Instruction	This command adds the specified number of segments to the scratch mixer beginning at the specified segment position.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. Segment numbers must be sequential. If a new number is added where one currently exists, the existing segment and those following are incremented by one. <numeric> :Number of segments to add. The number of added segments is less than the maximum number of segments.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Add
Example	:SENS:MIXer:SEGM:ADD 2

3.21.1.14 Segment State

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:STATe <bool> :SENSe<cnum>:MIXer:SEGMent<segnum>:STATe?
Instruction	This command sets/gets the ON/OFF state for the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Segment Enable
Example	:SENS:MIX:SEGM:STATe ON :SENS:MIX:SEGM:STATe? Return: 1

3.21.1.15 Segment Number of Mixer

Command Format	:SENSe<cnum>:MIXer:SEGMent:COUNt?
Instruction	This command gets the number of segments on the Applied mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Segment
Example	:SENS:MIXer:SEGM:COUN? Return: 1

3.21.1.16 Delete Segments from Mixer

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:DELete <numeric>
Instruction	This command removes the specified number of segments from the scratch mixer starting at the index position.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Number of segments to remove. The number of segments after deletion is not less than 0.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Delete
Example	:SENS:MIXer:SEGM:DEL 1

3.21.1.17 Clear Segments Table of Mixer

Command Format	:SENSe<cnum>:MIXer:SEGMent:DELete:ALL
Instruction	This command removes all segments from the scratch mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	None
Default	None
Menu	None
Example	:SENS:MIX:SEGM:DEL:ALL

3.21.1.18 Segment Frequency Calculates

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:CALCulate <type>
Instruction	This command calculates the Input, IF, or Output frequencies of the mixer setup.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <type>:={INPut|OUTPut|LO}, represents Mixer port to be calculated.
Return	None
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Calc
Example	:SENS:MIXer:SEGM:CALCulate INPut

3.21.1.19 Segment Input Sweep Mode

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:MODE <type> :SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:MODE ?
Instruction	This command sets/gets the Input sweep mode of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <type>:={FIXed|SWEPt}, represents Input sweep mode.
Return	Enumeration
Default	SWEPT
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep

	Sweep > Mixer Measure... > Mixer Frequency > Input
Example	:SENS:MIX:SEGM:INP:FREQ:MODE FIXED :SENS:MIX:SEGM:INP:FREQ:MODE? Return: FIXED

3.21.1.20 Segment Input Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:FIXed?
Instruction	This command sets/gets the Input fixed frequency of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric> :Input fixed frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Input > Fixed
Example	:SENS:MIX:SEGM:INP:FREQ:FIX 100000 :SENS:MIX:SEGM:INP:FREQ:FIX? Return: 100000

3.21.1.21 Segment Input Start Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STARt?
Instruction	This command sets/gets the Input start frequency value of the

	segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Input start frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Input > Start/Stop
Example	:SENS:MIX:SEGM:INP:FREQ:STAR 100000 :SENS:MIX:SEGM:INP:FREQ:STAR? Return: 100000

3.21.1.22 Segment Input Stop Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:FREQuency:STOP?
Instruction	This command sets/gets the Input stop frequency value of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Input stop frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep

	Sweep > Mixer Measure... > Mixer Frequency > Input > Start/Stop
Example	:SENS:MIX:SEGM:INP:FREQ:STOP 100000 :SENS:MIX:SEGM:INP:FREQ:STOP? Return: 100000

3.21.1.23 Segment Input Power

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:POWer <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:INPut:POWer?
Instruction	This command sets/gets the value of the Input Power of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Input power in dBm. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Input Power
Example	:SENS:MIX:SEGM:INP:POW 5 :SENS:MIX:SEGM:INP:POW? Return: 5

3.21.1.24 Segment LO Sweep Mode

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:MODE <type> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:MODE?
Instruction	This command sets/gets the LO sweep mode of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If

	not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <type>:={FIXed|SWEPt}, represents LO sweep mode.
Return	Enumeration
Default	FIXED
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Local
Example	:SENS:MIX:SEGM:LO:FREQ:MODE FIXED :SENS:MIX:SEGM:LO:FREQ:MODE? Return: FIXED

3.21.1.25 Mixer LO Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:FIXed?
Instruction	This command sets/gets the fixed frequency of the LO.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: LO fixed frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Local > Fixed
Example	:SENS:MIX:LO:FREQ:FIX 100000 :SENS:MIXer:LO:FREQuency:FIX? Return: 100000

3.21.1.26 Segment LO Start Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STARt?
Instruction	This command sets/gets the LO start frequency value of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: LO start frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Local > Start/Stop
Example	:SENS:MIX:SEGM:LO:FREQ:STARt 100000 :SENS:MIX:SEGM:LO:FREQ:STARt? Return: 100000

3.21.1.27 Segment LO Stop Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:STOP?
Instruction	This command sets/gets the LO stop frequency value of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1.

	<numeric>: LO stop frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Local > Start/Stop
Example	:SENS:MIX:SEGM:LO:FREQ:STOP 100000 :SENS:MIX:SEGM:LO:FREQ:STOP? Return: 100000

3.21.1.28 Segment LO Frequency State

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:ILTI <bool> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:FREQuency:ILTI?
Instruction	This command sets/gets whether to use the Input frequency that is greater than the LO or less than the LO of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output > "-" > Local > "Input > LO"
Example	:SENS:MIX:SEGM:LO:FREQ:ILTI OFF :SENS:MIX:SEGM:LO:FREQ:ILTI? Return: 0

3.21.1.29 Segment LO Power

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:LO:POWer <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:LO:POWer?
Instruction	This command sets/gets the value of the LO Power of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: LO power in dBm. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Local Power
Example	:SENS:MIX:SEGM:LO:POW 5 :SENS:MIX:SEGM:LO:POW? Return: 5

3.21.1.30 Segment Output Sweep Mode

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:MODE <type> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:MODE?
Instruction	This command sets/gets the Output sweep mode of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <type>:={FIXed|SWEPt}, represents Output sweep mode.
Return	Enumeration

Default	SWEPT
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output
Example	:SENS:MIX:SEGM:OUTP:FREQ:MODE FIXED :SENS:MIX:SEGM:OUTP:FREQ:MODE? Return: FIXED

3.21.1.31 Segment Output Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:FIXed?
Instruction	This command sets/gets the Output fixed frequency of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Output fixed frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output > Fixed
Example	:SENS:MIX:SEGM:OUTP:FREQ:FIX 100000 :SENS:MIX:SEGM:OUTP:FREQ:FIX? Return: 100000

3.21.1.32 Segment Output Start Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STARt?
Instruction	This command sets/gets the Output start frequency value of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Output start frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output > Start/Stop
Example	:SENS:MIX:SEGM:OUTP:FREQ:STAR 100000 :SENS:MIX:SEGM:OUTP:FREQ:STAR? Return: 100000

3.21.1.33 Segment Output Stop Frequency

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:STOP?
Instruction	This command sets/gets the Output stop frequency value of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1.

	<numeric>: Output stop frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output > Start/Stop
Example	:SENS:MIX:SEGM:OUTP:FREQ:STOP 100000 :SENS:MIX:SEGM:OUTP:FREQ:STOP? Return: 100000

3.21.1.34 Segment Output Frequency Calculate Method

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:SIDeband <type> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:FREQuency:SIDeband?
Instruction	This command sets/gets whether to select the sum (High) or difference (Low) products of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <type>:={LOW|HIGH}, represents Sideband value.
Return	Enumeration
Default	HIGH
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output
Example	:SENS:MIX:SEGM:OUTP:FREQ:SID HIGH :SENS:MIX:SEGM:OUTP:FREQ:SID? Return: HIGH

3.21.1.35 Segment Output Power

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:POWer <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:OUTPut:POWer?
Instruction	This command sets/gets the value of the Output Power of the segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: Output power in dBm. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	None
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Output Power
Example	:SENS:MIX:SEGM:OUTP:POW 5 :SENS:MIX:SEGM:OUTP:POW? Return: 5

3.21.1.36 Segment Sweep Points Number

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:POINts <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:POINts?
Instruction	This command sets/gets the number of data points for the sweep segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>: represents the sweep points.
Return	Integer

Default	21
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > Sweep Point
Example	:SENS:MIX:SEGM:POIN 21 :SENS:MIX:SEGM:POIN? Return: 21

3.21.1.37 Segment IF Bandwidth

Command Format	:SENSe<cnum>:MIXer:SEGMent<segnum>:BWIDth <numeric> :SENSe<cnum>:MIXer:SEGMent<segnum>:BWIDth?
Instruction	This command sets/gets the IF Bandwidth for the sweep segment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <segnum>: represents the segment number of segment sweep. If not specified, <segnum> defaults to 1. <numeric>:={1|2|3|4|5|6|7|10|15|20|30|40|50|70|100|150|200|300|400|500|700|1E3|1.5E3|2E3|3E3|4E3|5E3|7E3|10E3|15E3|20E3|30E3|40E3|50E3|70E3|100E3|150E3|200E3|300E3|400E3|500E3|700E3|1E6|1.5E6|2E6|3E6|4E6|5E6|7E6|10E6}, IF Bandwidth in Hz.
Return	Float, , in Hz.
Default	10kHz
Menu	Sweep > Mixer Measure... > Sweep > Segment Sweep Sweep > Mixer Measure... > Mixer Frequency > IF Bandwidth
Example	:SENS:MIXer:SEGM:BWIDth 1000 :SENS:MIXer:SEGM:BWIDth? Return: 1000

3.21.2 Mixer Input

3.21.2.1 Command list

Mixer Input Sweep Mode	:SENSe<cnum>:MIXer:INPut:FREQuency:MODE
Mixer Input Start Frequency	:SENSe<cnum>:MIXer:INPut:FREQuency:STARt
Mixer Input Stop Frequency	:SENSe<cnum>:MIXer:INPut:FREQuency:STOP
Mixer Input Fixed Frequency	:SENSe<cnum>:MIXer:INPut:FREQuency:FIXed
Mixer Input Divisor	:SENSe<cnum>:MIXer:INPut:FREQuency:DENominator
Mixer Input Multiplier	:SENSe<cnum>:MIXer:INPut:FREQuency:NUMerator
Mixer Input Power	:SENSe<cnum>:MIXer:INPut:POWe
Mixer Input Start Frequency	:SENSe<cnum>:MIXer:INPut:POWer:STARt
Mixer Input Start Frequency	:SENSe<cnum>:MIXer:INPut:POWer:STOP

3.21.2.2 Mixer Input Sweep Mode

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:MODE <type> :SENSe<cnum>:MIXer:INPut:FREQuency:MODE?
Instruction	Set or get input sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={FIXed|SWEPt}, Indicates input sweep mode
Return	Enum
Default	SWEPT
Menu	Sweep > Mixer Measure... > Mixer Frequency > Input
Example	:SENS:MIX:INP:FREQ:MODE FIXED :SENSe:MIXer:INPut:FREQuency:MODE? Return: FIXED

3.21.2.3 Mixer Input Start Frequency

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:INPut:FREQuency:STARt?

Instruction	This command sets/gets the Input start frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input start frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Input > Start/Stop
Example	:SENS:MIX:INP:FREQ:STAR 100000 :SENS:MIXer:INPut:FREQuency:STARt? Return: 100000

3.21.2.4 Mixer Input Stop Frequency

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:INPut:FREQuency:STOP?
Instruction	This command sets/gets the Input stop frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric> Input stop frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Input > Start/Stop
Example	:SENS:MIX:INP:FREQ:STOP 100000 :SENS:MIXer:INPut:FREQuency:STOP? Return: 100000

3.21.2.5 Mixer Input Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:INPut:FREQuency:FIXed?
Instruction	This command sets/gets the fixed frequency of the input.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input fixed frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Input > Fixed
Example	:SENS:MIX:INP:FREQ:FIX 100000 :SENS:MIXer:INPut:FREQuency:FIXed? Return: 100000

3.21.2.6 Mixer Input Divisor

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:DENominator <numeric> :SENSe<cnum>:MIXer:INPut:FREQuency:DENominator?
Instruction	This command sets/gets the denominator value of the Input Fractional Multiplier.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input denominator value. The range is 1 to 100.
Return	Integer
Default	1
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIX:INP:FREQ:DEN 2 :SENS:MIXer:INPut:FREQuency:DENominator? Return: 2

3.21.2.7 Mixer Input Multiplier

Command Format	:SENSe<cnum>:MIXer:INPut:FREQuency:NUMerator <numeric> :SENSe<cnum>:MIXer:INPut:FREQuency:NUMerator?
Instruction	This command sets/gets the numerator value of the Input Fractional Multiplier.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input numerator value. The range is 1 to 100.
Return	Integer
Default	None
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIX:INP:FREQ:NUM 2 :SENS:MIXer:INPut:FREQuency:NUMerator? Return: 2

3.21.2.8 Mixer Input Power

Command Format	:SENSe<cnum>:MIXer:INPut:POWer <numeric> :SENSe<cnum>:MIXer:INPut:POWer?
Instruction	This command sets/gets the input power.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input power level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Input Port > Power Level
Example	:SENS:MIX:INP:POW 5 :SENS:MIXer:INPut:POWer? Return: 5

3.21.2.9 Mixer Input Start Frequency

Command Format	:SENSe<cnum>:MIXer:INPut:POWer:STARt <numeric> :SENSe<cnum>:MIXer:INPut:POWer:STARt?
Instruction	This command sets/gets the input start power, only effective in power sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input start power level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Input Port Power Sweep> Start Power
Example	:SENS:MIX:INP:POW:STAR 5 :SENS:MIXer:INPut:POWer:STARt? Return: 5

3.21.2.10 Mixer Input Start Frequency

Command Format	:SENSe<cnum>:MIXer:INPut:POWer:STOP<numeric> :SENSe<cnum>:MIXer:INPut:POWer:STOP?
Instruction	This command sets/gets the input stop power, only effective in power sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Input stoppower level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Input Port Power Sweep>

	Stop Power
Example	:SENS:MIX:INP:POW:STOP 5 :SENS:MIXer:INPut:POWer:STOP? Return: 5

3.21.3 Mixer LO

3.21.3.1 Command List

LO Source Name	:SENSe<cnum>:MIXer:LO:NAME
Mixer LO Sweep Mode	:SENSe<cnum>:MIXer:LO:FREQuency:MODE
Mixer LO Start Frequency	:SENSe<cnum>:MIXer:LO:FREQuency:STARt
Mixer LO Stop Frequency	:SENSe<cnum>:MIXer:LO:FREQuency:STOP
Mixer LO Fixed Frequency	:SENSe<cnum>:MIXer:LO:FREQuency:FIXed
Mixer LO Frequency State	:SENSe<cnum>:MIXer:LO:FREQuency:ILTI
Mixer LO Divisor	:SENSe<cnum>:MIXer:LO:FREQuency:DENominator
Mixer LO Multiplier	:SENSe<cnum>:MIXer:LO:FREQuency:NUMerator
Mixer LO Power	:SENSe<cnum>:MIXer:LO:POWer
LO Start Power of Power Sweep	:SENSe<cnum>:MIXer:LO:POWer:STARt
LO Stop Power of Power Sweep	:SENSe<cnum>:MIXer:LO:POWer:STOP

3.21.3.2 LO Source Name

Command Format	:SENSe<cnum>:MIXer:LO:NAME <string> :SENSe<cnum>:MIXer:LO:NAME?
Instruction	This command sets/gets the name of the external source to use as the LO in a converter measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <string>: LO Source name.

Return	String
Default	"Not Controlled"
Menu	Sweep > Mixer Measure... > Sweep > Power Sweep > Converter Model > Local
Example	:SENS:MIX:LO:NAME "Not Controlled" :SENS:MIXer:LO:NAME? Return: "Not Controlled "

3.21.3.3 Mixer LO Sweep Mode

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:MODE <type> :SENSe<cnum>:MIXer:LO:FREQuency:MODE?
Instruction	This command sets/gets the LO sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={FIXed|SWEPt}, represents LO sweep mode.
Return	Enumeration
Default	FIXED
Menu	Sweep > Mixer Measure... > Mixer Frequency > Local
Example	:SENSe:MIX:LO:FREQ:MODE FIXED :SENSe:MIXer:LO:FREQuency:MODE? Return: FIXED

3.21.3.4 Mixer LO Start Frequency

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:LO:FREQuency:STARt?
Instruction	This command sets/gets the LO start frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO start frequency in Hz. Choose any number between the

	minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Local > Start/Stop
Example	:SENS:MIX:LO:FREQ:STAR 100000 :SENS:MIXer:LO:FREQuency:STARt? Return: 100000

3.21.3.5 Mixer LO Stop Frequency

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:LO:FREQuency:STOP?
Instruction	This command sets/gets the LO stop frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO stop frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Local > Start/Stop
Example	:SENS:MIX:LO:FREQ:STOP 100000 :SENS:MIXer:LO:FREQuency:STOP? Return: 100000

3.21.3.6 Mixer LO Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:LO:FREQuency:FIXed?
Instruction	This command sets/gets the fixed frequency of the LO.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO fixed frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Local > Fixed
Example	:SENS:MIX:LO:FREQ:FIX 100000 :SENS:MIXer:LO:FREQuency:FIX? Return: 100000

3.21.3.7 Mixer LO Frequency State

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:ILTI <bool> :SENSe<cnum>:MIXer:LO:FREQuency:ILTI?
Instruction	This command sets/gets whether to use the Input frequency that is greater than the LO or less than the LO.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output > "-" > Local > "Input > LO"
Example	:SENS:MIX:LO:FREQ:ILTI OFF :SENS:MIXer:LO:FREQuency:ILTI? Return: 0

3.21.3.8 Mixer LO Divisor

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:DENominator <numeric> :SENSe<cnum>:MIXer:LO:FREQuency:DENominator?
Instruction	This command sets/gets the denominator value of the LO Fractional Multiplier.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO denominator value. The range is 1 to 100.
Return	Integer
Default	1
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIX:LO:FREQ:DEN 2 :SENS:MIXer:LO:FREQuency:DENominator? Return: 2

3.21.3.9 Mixer LO Multiplier

Command Format	:SENSe<cnum>:MIXer:LO:FREQuency:NUMerator <numeric> :SENSe<cnum>:MIXer:LO:FREQuency:NUMerator?
Instruction	This command sets/gets the numerator value of the LO Fractional Multiplier.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO numerator value. The range is 1 to 100.
Return	Integer
Default	None
Menu	Sweep > Mixer Measure... > Mixer Setup > Converter Model
Example	:SENS:MIX:LO:FREQ:NUM 2 :SENS:MIXer:LO:FREQuency:NUMerator? Return: 2

3.21.3.10 Mixer LO Power

Command Format	:SENSe<cnum>:MIXer:LO:POWer <numeric> :SENSe<cnum>:MIXer:LO:POWer?
Instruction	This command sets/gets the value of the LO Power.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO power in dBm. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	None
Menu	Sweep > Mixer Measure... > Mixer Setup > Power Level
Example	:SENS:MIX:LO:POW -5 :SENS:MIXer:LO:POWer? Return: -5

3.21.3.11 LO Start Power of Power Sweep

Command Format	:SENSe<cnum>:MIXer:LO:POWer:STARt <numeric> :SENSe<cnum>:MIXer:LO:POWer:STARt?
Instruction	This command sets/gets the LO power start value for an LO power sweep.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO start power of power sweep. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	-10 dBm
Menu	Sweep > Mixer Measure... > Sweep > Power Sweep Sweep > Mixer Measure... > Mixer Setup > Swpet Power > Start
Example	:SENS:MIX:LO:POW:STAR -5

	:SENS:MIXer:LO:POWer:STARt? Return: -5

3.21.3.12 LO Stop Power of Power Sweep

Command Format	:SENSe<cnum>:MIXer:LO:POWer:STOP <numeric> :SENSe<cnum>:MIXer:LO:POWer:STOP?
Instruction	This command sets/gets the LO power stop value for an LO power sweep.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: LO stop power of power sweep. The range is -10dBm to 10dBm.
Return	Float, in dBm
Default	-10 dBm
Menu	Sweep > Mixer Measure... > Sweep > Power Sweep Sweep > Mixer Measure... > Mixer Setup > Swpet Power > Stop
Example	:SENS:MIX:LO:POW:STOP -5 :SENS:MIXer:LO:POWer:STOP? Return: -5

3.21.4 Mixer Output

3.21.4.1 Command List

Mixer Output Sweep Mode	:SENSe<cnum>:MIXer:OUTPut:FREQuency:MODE
Mixer Output Start Frequency	:SENSe<cnum>:MIXer:OUTPut:FREQuency:STARt
Mixer Output Stop Frequency	:SENSe<cnum>:MIXer:OUTPut:FREQuency:STOP
Mixer Output Fixed Frequency	:SENSe<cnum>:MIXer:OUTPut:FREQuency:FIXed
Mixer Output Frequency Calculate	:SENSe<cnum>:MIXer:OUTPut:FREQuency:SIDeband

Method	
Mixer Output Power	:SENSe<cnum>:MIXer:OUTPut:POWe
Mixer Input Start Frequency	:SENSe<cnum>:MIXer:OUTPut:POWer:STARt
Mixer Input Start Frequency	:SENSe<cnum>:MIXer:OUTPut:POWer:STOP

3.21.4.2 Mixer Output Sweep Mode

Command Format	:SENSe<cnum>:MIXer:OUTPut:FREQuency:MODE <type> :SENSe<cnum>:MIXer:OUTPut:FREQuency:MODE?
Instruction	This command sets/gets the Output sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={FIXed|SWEPt}, represents Output sweep mode.
Return	Enumeration
Default	SWEPT
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output
Example	:SENS:MIX:OUTP:FREQ:MODE FIXED :SENSe:MIXer:OUTPut:FREQuency:MODE? Return: FIXED

3.21.4.3 Mixer Output Start Frequency

Command Format	:SENSe<cnum>:MIXer:OUTPut:FREQuency:STARt <numeric> :SENSe<cnum>:MIXer:OUTPut:FREQuency:STARt?
Instruction	This command sets/gets the Output start frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output Start Frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.

Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output > Start/Stop
Example	:SENS:MIX:OUTP:FREQ:STAR 100000 :SENS:MIXer:OUTPut:FREQuency:STARt? Return: 100000

3.21.4.4 Mixer Output Stop Frequency

Command Format	:SENSe<cnum>:MIXer:OUTPut:FREQuency:STOP <numeric> :SENSe<cnum>:MIXer:OUTPut:FREQuency:STOP?
Instruction	This command sets/gets the Output stop frequency value of the mixer.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output Stop Frequency in Hz. Choose any number between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output > Start/Stop
Example	:SENS:MIX:OUTP:FREQ:STOP 100000 :SENS:MIXer:OUTPut:FREQuency:STOP? Return: 100000

3.21.4.5 Mixer Output Fixed Frequency

Command Format	:SENSe<cnum>:MIXer:OUTPut:FREQuency:FIXed <numeric> :SENSe<cnum>:MIXer:OUTPut:FREQuency:FIXed?
Instruction	This command sets/gets the fixed frequency of the output.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output fixed frequency in Hz. Choose any number

	between the minimum and maximum frequency of the SNA.
Return	Float, in Hz.
Default	None
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output > Fixed
Example	:SENS:MIX:OUTP:FREQ:FIX 100000 :SENS:MIXer:OUTPut:FREQuency:FIX? Return: 100000

3.21.4.6 Mixer Output Frequency Calculate Method

Command Format	:SENSe<cnum>:MIXer:OUTPut:FREQuency:SIDeband <type> :SENSe<cnum>:MIXer:OUTPut:FREQuency:SIDeband?
Instruction	This command sets/gets whether to select the sum (High) or difference (Low) products. When using this command to change the calculation method of output frequency to difference (LOW), that default input signal frequency > LO signal frequency.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={LOW|HIGH}, represents Sideband value.
Return	Enumeration
Default	HIGH
Menu	Sweep > Mixer Measure... > Mixer Frequency > Output
Example	:SENS:MIX:OUTP:FREQ:SID HIGH :SENSe:MIXer:OUTPut:FREQuency:SIDeband? Return: HIGH

3.21.4.7 Mixer Output Power

Command Format	:SENSe<cnum>:MIXer:OUTPut:POWer <numeric>

	:SENSe<cnum>:MIXer:OUTPut:POWer?
Instruction	This command sets/gets the output power, which can be used for reverse measurement of the mixer. It can only be set when it is not coupled with the input port power of the mixer, otherwise it should be consistent with the input port power.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output power level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Output Port > Power Level
Example	:SENS:MIX:OUTP:POW 5 :SENS:MIXer:OUTPut:POWer? Return: 5

3.21.4.8 Mixer Output Start Power

Command Format	:SENSe<cnum>:MIXer:OUTPut:POWer:STARt <numeric> :SENSe<cnum>:MIXer:OUTPut:POWer:STARt?
Instruction	This command sets/gets the output power, which can be used for reverse measurement of the mixer. It can only be set when it is not coupled with the input port power of the mixer, otherwise it should be consistent with the input port power.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output start power level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Output Port Power Sweep> Start Power
Example	:SENS:MIX:OUTP:POW:STAR 5

	:SENS:MIXer:OUTPut:POWer:STARt? Return: 5

3.21.4.9 Mixer Output Stop Power

Command Format	:SENSe<cnum>:MIXer:OUTPut:POWer:STOP<numeric> :SENSe<cnum>:MIXer:OUTPut:POWer:STOP?
Instruction	This command sets/gets the output power, which can be used for reverse measurement of the mixer. It can only be set when it is not coupled with the input port power of the mixer, otherwise it should be consistent with the input port power.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>: Output stoppower level. The range is -55dBm~20dBm.
Return	Float, unit dBm
Default	None
Menu	Sweep > Mixer Measure... > Power > DUT Output Port Power Sweep> Stop Power
Example	:SENS:MIX:OUTP:POW:STOP 5 :SENS:MIXer:OUTPut:POWer:STOP? Return: 5

3.22 TDR Commands(Option)

3.22.1 Setup

3.22.1.1 Basic

3.22.1.1.1 Command list

TDR State	:CALCulate:TDR:STATe

TDR Option Preset	:SYSTem:TDR:PRESet
DUT topology	:CALCulate:DEVice
Time Stimulus Voltage	:CALCulate:ATRaces:TIME:STEP:AMPLitude
Measure DUT length	:SENSe:DLENgth:AUTO:IMMediate
DUT length	:SENSe:DLENgth:DATA

3.22.1.1.2 TDR State

Command Format	:CALCulate:TDR:STATe <bool> :CALCulate:TDR:STATe?
Instruction	This command sets/gets TDR option enable state.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Math > TDR > TDR
Example	:CALC:TDR:STAT ON :CALC:TDR:STAT? Return: 1

3.22.1.1.3 TDR Option Preset

Command Format	:SYSTem:TDR:PRESet
Instruction	This command sets the TDR option to the default state. Calibration data will be lost.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Preset
Example	:SYST:TDR:PRES

3.22.1.1.4 DUT topology

Command Format	:CALCulate:DEVice <type> :CALCulate:DEVice?
Instruction	This command sets step amplitude value for the transform function.
Parameter Type	<type>:={SEND1|SEND2|DIF1|SEND4|DIF2}
Return	Enumeration
Default	SEND1
Menu	Setup > Basic > DUT topology
Example	:CALC:DEV SEND2 :CALC:DEV? Return: SEND2

3.22.1.1.5 Time Stimulus Voltage

Command Format	:CALCulate:ATRaces:TIME:STEP:AMPLitude <numeric> :CALCulate:ATRaces:TIME:STEP:AMPLitude?
Instruction	This command sets/gets step amplitude value for the transform function.
Parameter Type	<numeric>:represents the Stimulus Voltage value, and the parameter range: 0.001~5.
Return	Float, unit: V (Voltage)
Default	0.2
Menu	Setup > Basic > Stim Ampl
Example	:CALC:ATR:TIME:STEP:AMPL 0.5 :CALC:ATR:TIME:STEP:AMPL? Return: 0.5

3.22.1.1.6 Measure DUT length

Command Format	:SENSe:DLENgth:AUTO:IMMediate
Instruction	This command executes auto DUT length setting.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > DUT Length > Auto > Measure
Example	:SENS:DLEN:AUTO:IMM

3.22.1.1.7 DUT length

Command Format	:SENSe:DLENgth:DATA <numeric> :SENSe:DLENgth:DATA?
Instruction	This command sets DUT length value.
Parameter Type	<numeric>:represents the DUT length value.
Return	Float, unit: s (second)
Default	None
Menu	Setup > Basic > DUT Length
Example	:SENS:DLEN:DATA 6.26e-9 :SENS:DLEN:DATA? Return: 6.26e-09

3.22.1.2 Calibration

3.22.1.2.1 Command list

Deskew Standard Type	:SENSe:CORRection:EXTension:AUTO:STANdard
Execute Deskew	:SENSe:CORRection:EXTension:AUTO:IMMediate
Deskew & Loss Open	:SENSe:CORRection:COLLection:DLComp:OPEN

Deskew & Loss Thru	:SENSe:CORRection:COLLection:DLComp:THRU
Deskew & Loss Load	:SENSe:CORRection:COLLection:DLComp:LOAD
Deskew & Loss Save	:SENSe:CORRection:COLLection:DLComp:SAVE

3.22.1.2.2 Deskew Standard Type

Command Format	:SENSe:CORRection:EXTension:AUTO:STANdard <type> :SENSe:CORRection:EXTension:AUTO:STANdard?
Instruction	This command sets the standard for auto port extension.
Parameter Type	<type>:={OPEN|SHORt}
Return	Enumeration
Default	OPEN
Menu	Setup > Basic > Deskew > Options > Standard Type Setup > Basic > Deskew&Loss > Options > Standard Type
Example	:SENS:CORR:EXT:AUTO:STAN SHOR :SENS:CORR:EXT:AUTO:STAN? Return: SHOR

3.22.1.2.3 Execute Deskew

Command Format	:SENSe:CORRection:EXTension:AUTO:IMMediate
Instruction	This command executes deskew (auto port extension).
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Deskew > Deskew
Example	:SENS:CORR:EXT:AUTO:STAN SHOR :SENS:CORR:EXT:AUTO:IMM

3.22.1.2.4 Deskew & Loss Open

Command Format	:SENSe:CORRection:COLLection:DLComp:OPEN
Instruction	This command executes an open measurement, as a part of Loss Compensation sequence.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Deskew & Loss > Measure
Example	:SENS:CORR:COLL:DLC:OPEN :SENS:CORR:COLL:DLC:SAVE

3.22.1.2.5 Deskew & Loss Thru

Command Format	:SENSe:CORRection:COLLection:DLComp:THRU
Instruction	This command executes a thru measurement, as a part of Loss Compensation sequence.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Deskew & Loss > Measure
Example	:SENS:CORR:COLL:DLC:THRU

3.22.1.2.6 Deskew & Loss Load

Command Format	:SENSe:CORRection:COLLection:DLComp:LOAD
Instruction	This command executes a load measurement, as a part of Loss Compensation sequence.

Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Deskew & Loss > Load x
Example	:SENS:CORR:COLL:DLC:LOAD

3.22.1.2.7 Deskew & Loss Save

Command Format	:SENSe:CORRection:COLLection:DLComp:SAVE
Instruction	This command saves the result of Loss Compensation sequence.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Basic > Deskew & Loss > Apply
Example	:SENS:CORR:COLL:DLC:OPEN :SENS:CORR:COLL:DLC:THRU :SENS:CORR:COLL:DLC:LOAD :SENS:CORR:COLL:DLC:SAVE

3.22.1.3 More functions

3.22.1.3.1 Command List

System Impedance	:SENSe:CORRection:RIMPedance
Dielectric Constant	:SENSe:CORRection:DCONstant

3.22.1.3.2 System Impedance

Command Format	:SENSe:CORRection:RIMPedance <numeric> :SENSe:CORRection:RIMPedance?

Instruction	This command sets reference impedance value.
Parameter Type	<numeric>:represents the reference impedance value.
Return	Float
Default	50
Menu	Setup > More Functions > Ref. Z
Example	:SENS:CORR:RIMP 75 :SENS:CORR:RIMP? Return: 75

3.22.1.3.3 Dielectric Constant

Command Format	:SENSe:CORRection:DCONstant <numeric> :SENSe:CORRection:DCONstant?
Instruction	This command sets dielectric constant value.
Parameter Type	<numeric>:represents the dielectric constant value.
Return	Float
Default	1
Menu	Setup > More Functions > Dielectric Const
Example	:SENS:CORR:DCON 2 :SENS:CORR:DCON? Return: 2

3.22.1.4 TDR AvgBW

3.22.1.4.1 Commands List

Average Enable	:TRIGger:AVERage

3.22.1.4.2 Average Enable

Command Format	:TRIGger:AVERage <bool> :TRIGger:AVERage?
Instruction	This command sets averaging trigger on/off. When averaging trigger is on, one trigger makes one averaging measurement. For example, if the averaging factor is set at 16, one trigger makes a measurement for 16 times.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Setup > Average > Averaging
Example	:TRIG:AVER ON :TRIG:AVER? Return: 1

3.22.1.5 Advanced waveform

3.22.1.5.1 Command List

Jitter Enable	:CALCulate:EYE:INPut:JITTer:STATe
Jitter Type	:CALCulate:EYE:INPut:JITTer:TYPE
Random Jitter Magnitude	:CALCulate:EYE:INPut:JITTer:RANDom:MAGNitude
Periodic Jitter Frequency	:CALCulate:EYE:INPut:JITTer:PERiodic:FREQuency
Periodic Jitter Magnitude	:CALCulate:EYE:INPut:JITTer:PERiodic:MAGNitude
De-embeding Enable State	:CALCulate:EMBed:STATe
Waveform View Point	:DISPlay:ATRaces:VIEW
Port De-embeding S2P Filename	:CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:FILename
Port De-embeding Enable State	:CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:STATe
Diff Port De-embeding S4P Filename	:CALCulate:EMBed:S4P:DIFF<pnum>:FILename
Diff Port De-embeding Enable State	:CALCulate:EMBed:S4P:DIFF<pnum>:STATe
Emphasis Enable	:CALCulate:EMPHasis:STATe
Emphasis Pre Cursor	:CALCulate:EMPHasis:CURSor:PRE1
Emphasis Post 1 Cursor	:CALCulate:EMPHasis:CURSor:POST1

Emphasis Post 2 Cursor	:CALCulate:EMPHasis:CURSor:POST2
Equalization Enable	:CALCulate:EQUalization:STATe
Equalizer Type	:CALCulate:EQUalization:TYPE
Equalization DC Gain	:CALCulate:EQUalization:CTLE:DC
Equalization Zero Frequency	:CALCulate:EQUalization:CTLE:ZERO1
Equalization Pole1 Frequency	:CALCulate:EQUalization:CTLE:POLE1
Equalization Pole2 Frequency	:CALCulate:EQUalization:CTLE:POLE2
Equalizer User File	:CALCulate:EQUalization:FILename

3.22.1.5.2 Jitter Enable

Command Format	:CALCulate:EYE:INPut:JITTer:STATe <bool> :CALCulate:EYE:INPut:JITTer:STATe?
Instruction	This command sets the jitter function state with simulated eye on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Eye/Mask > Advanced Waveform > Jitter > Enable
Example	:CALC:EYE:INP:JITT:STAT ON :CALC:EYE:INP:JITT:STAT? Return: 1

3.22.1.5.3 Jitter Type

Command Format	:CALCulate:EYE:INPut:JITTer:TYPE <type> :CALCulate:EYE:INPut:JITTer:TYPE?
Instruction	This command sets the jitter function type for the simulated eye function.
Parameter Type	<type>:={RANDom|PERiodic}
Return	Enumeration

Default	PERiodic
Menu	Eye/Mask > Advanced Waveform > Jitter > Type > Random/Periodic
Example	:CALC:EYE:INP:JITT:TYPE RAND :CALC:EYE:INP:JITT:TYPE? Return: RAND

3.22.1.5.4 Random Jitter Magnitude

Command Format	:CALCulate:EYE:INPut:JITTer:RANDom:MAGNitude <numeric> :CALCulate:EYE:INPut:JITTer:RANDom:MAGNitude?
Instruction	This command sets the random jitter magnitude in rms. This value is used only when random jitter function type is selected.
Parameter Type	<numeric>:represents the random jitter magnitude in rms, and the parameter range: 0~0.25 UI.
Return	Float
Default	0
Menu	Eye/Mask > Advanced Waveform > Jitter > Random Jitter > Magnitude(RMS)
Example	:CALC:EYE:INP:JITT:RAND:MAGN 0.2 :CALC:EYE:INP:JITT:RAND:MAGN? Return: 0.2

3.22.1.5.5 Periodic Jitter Frequency

Command Format	:CALCulate:EYE:INPut:JITTer:PERiodic:FREQuency <numeric> :CALCulate:EYE:INPut:JITTer:PERiodic:FREQuency?
Instruction	This command sets the periodic jitter frequency. This value is used only when periodic jitter function type is selected.
Parameter Type	<numeric>:represents the periodic jitter frequency, and the parameter range: 0~2MHz.

Return	Float, unit: Hz
Default	500kHz
Menu	Eye/Mask > Advanced Waveform > Jitter > Periodic Jitter > Frequency
Example	:CALC:EYE:INP:JITT:PER:FREQ 10E3 :CALC:EYE:INP:JITT:PER:FREQ? Return: 10000

3.22.1.5.6 Periodic Jitter Magnitude

Command Format	:CALCulate:EYE:INPut:JITTer:PERiodic:MAGNitude <numeric> :CALCulate:EYE:INPut:JITTer:PERiodic:MAGNitude?
Instruction	This command sets the periodic jitter magnitude in peak-peak value. This value is used only when periodic jitter function type is selected.
Parameter Type	<numeric>:represents the periodic jitter magnitude in peak-peak value, and the parameter range: 0~1 UI.
Return	Float
Default	0
Menu	Eye/Mask > Advanced Waveform > Jitter > Periodic Jitter > Magnitude
Example	:CALC:EYE:INP:JITT:PER:MAGN 0.2 :CALC:EYE:INP:JITT:PER:MAGN? Return: 0.2

3.22.1.5.7 De-embeding Enable State

Command Format	:CALCulate:EMBed:STATe <bool> :CALCulate:EMBed:STATe?
Instruction	This command sets the embed function state on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	Setup > Adv Waveform > De-embeding > Enable
Example	:CALC:EMB:STAT ON :CALC:EMB:STAT? Return: 1

3.22.1.5.8 Waveform View Point

Command Format	:DISPlay:ATRaces:VIEW <type> :DISPlay:ATRaces:VIEW?
Instruction	This command selects the view point for waveform analysis either before or after DUT.
Parameter Type	<type>:={STIMulus|RESPonse}
Return	Enumeration
Default	RESPonse
Menu	Setup > Adv Waveform > Emphasis/Equalization > View
Example	:DISP:ATR:VIEW STIMulus :DISP:ATR:VIEW? Return: STIM

3.22.1.5.9 Port De-embeding S2P Filename

Command Format	:CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:FILename <string> :CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:FILename?
Instruction	This command sets/gets the filename of the S2P de-embedding user file. This file is saved as a 2-port touchstone file with the .s2p extension.
Parameter Type	<pnum>:={[1]|2|3|4}, specifies the measurement port number. <string>: represents he filename of the S2P.
Return	String
Default	None

Menu	Setup > Adv Waveform > De-embeding > Load
Example	:CALC:EMB:S2P:PORT1:DEEM:FIL "local/file.s2p" :CALC:EMB:S2P:PORT1:DEEM:FIL? Return: local/file.s2p

3.22.1.5.10Port De-embeding Enable State

Command Format	:CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:STATe <bool> :CALCulate:EMBed:S2P:PORT<pnum>:DEEMbed:STATe?
Instruction	This command sets the S2P de-embedding function state ON/OFF. To turn ON, it is necessary to load the S2P file in advance.
Parameter Type	<pnum>:={[1]|2|3|4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Setup > Adv Waveform > De-embeding > Select De-embeding File > Enable
Example	:CALC:EMB:S2P:PORT1:DEEM:STAT ON :CALC:EMB:S2P:PORT1:DEEM:STAT? Return: 1

3.22.1.5.11Diff Port De-embeding S4P Filename

Command Format	:CALCulate:EMBed:S4P:DIFF<pnum>:FILename <string> :CALCulate:EMBed:S4P:DIFF<pnum>:FILename?
Instruction	This command sets the filename of the S4P de-embedding user file. This file is saved as a 4-port touchstone file with the .s4p extension.
Parameter Type	<pnum>:={[1]|2|3|4}, specifies the measurement port number. <string>: represents he filename of the S4P.
Return	String

Default	None
Menu	Setup > Adv Waveform > De-embeding > Load
Example	:CALC:EMB:S4P:DIFF1:FIL "local/file.s4p" :CALC:EMB:S4P:DIFF1:FIL? Return: local/file.s4p

3.22.1.5.12Diff Port De-embeding Enable State

Command Format	:CALCulate:EMBed:S4P:DIFF<pnum>:STATe <bool> :CALCulate:EMBed:S4P:DIFF<pnum>:STATe?
Instruction	This command sets the S4P de-embedding function state on/off.
Parameter Type	<pnum>:={[1]|2|3|4}, specifies the measurement port number. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Setup > Adv Waveform > De-embeding > Select De-embeding File > Enable
Example	:CALC:EMB:S4P:DIFF1:STAT ON :CALC:EMB:S4P:DIFF1:STAT? Return: 1

3.22.1.5.13Emphasis Enable

Command Format	:CALCulate:EMPHasis:STATe <bool> :CALCulate:EMPHasis:STATe?
Instruction	This command sets the emphasis function state on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF

Menu	Setup > Adv Waveform > Emphasis > Enable
Example	:CALC:EMPH:STAT ON :CALC:EMPH:STAT? Return: 1

3.22.1.5.14Emphasis Pre Cursor

Command Format	:CALCulate:EMPHasis:CURSor:PRE1 <numeric> :CALCulate:EMPHasis:CURSor:PRE1?
Instruction	This command sets the emphasis pre1 level.
Parameter Type	<numeric>:represents the emphasis pre1 level, and the parameter range: -20~20 dB.
Return	Float, unit: dB
Default	0 dB
Menu	Setup > Adv Waveform > Emphasis > Pre Cursor
Example	:CALC:EMPH:CURS:PRE1 3 :CALC:EMPH:CURS:PRE1? Return: 3

3.22.1.5.15Emphasis Post 1 Cursor

Command Format	:CALCulate:EMPHasis:CURSor:POST1 <numeric> :CALCulate:EMPHasis:CURSor:POST1?
Instruction	This command sets/gets the emphasis post1 level.
Parameter Type	<numeric>:represents the emphasis post1 level, and the parameter range: -20~20 dB.
Return	Float, unit: dB
Default	-3.5 dB
Menu	Setup > Adv Waveform > Emphasis > Post 1 Cursor

Example	:CALC:EMPH:CURS:POST1 3 :CALC:EMPH:CURS:POST1? Return: 3

3.22.1.5.16Emphasis Post 2 Cursor

Command Format	:CALCulate:EMPHasis:CURSor:POST2 <numeric> :CALCulate:EMPHasis:CURSor:POST2?
Instruction	This command sets the emphasis post2 level.
Parameter Type	<numeric>:represents the emphasis post2 level, and the parameter range: -20~20 dB.
Return	Float, unit: dB
Default	0 dB
Menu	Setup > Adv Waveform > Emphasis > Post 2 Cursor
Example	:CALC:EMPH:CURS:POST2 3 :CALC:EMPH:CURS:POST2? Return: 3

3.22.1.5.17Equalization Enable

Command Format	:CALCulate:EQUalization:STATe <bool> :CALCulate:EQUalization:STATe?
Instruction	This command sets the equalization function state on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Setup > Adv Waveform > Equalization > Enable
Example	:CALC:EQU:STAT ON :CALC:EQU:STAT?

	Return: 1

3.22.1.5.18Equalizer Type

Command Format	:CALCulate:EQUalization:TYPE <type> :CALCulate:EQUalization:TYPE?
Instruction	This command sets the equalization type.
Parameter Type	<type>:={EQUation|USER}
Return	String
Default	EQUation
Menu	Setup > Adv Waveform > Equalization > Type
Example	:CALC:EQU:TYPE USER :CALC:EQU:TYPE? Return: USER

3.22.1.5.19Equalization DC Gain

Command Format	:CALCulate:EQUalization:CTLE:DC <numeric> :CALCulate:EQUalization:CTLE:DC?
Instruction	This command sets the equalization CTLE (Continuous Time Linear Equalization) DC gain parameter.
Parameter Type	<numeric>:represents the DC gain parameter, and the parameter range: 0~10.
Return	Float
Default	0.667
Menu	Setup > Adv Waveform > Equalization > DC Gain
Example	:CALC:EQU:CTLE:DC 0.5 :CALC:EQU:CTLE:DC? Return: 0.5

3.22.1.5.20Equalization Zero Frequency

Command Format	:CALCulate:EQUalization:CTLE:ZERO1 <numeric> :CALCulate:EQUalization:CTLE:ZERO1?
Instruction	This command sets the equalization CTLE (Continuous Time Linear Equalization) zero parameter.
Parameter Type	<numeric>:represents the frequency value, and the parameter range: 0~20GHz.
Return	Float, unit: Hz
Default	650MHz
Menu	Setup > Adv Waveform > Equalization > Zero Freq
Example	:CALC:EQU:CTLE:ZERO1 7.5E8 :CALC:EQU:CTLE:ZERO1? Return: 750000000

3.22.1.5.21Equalization Pole1 Frequency

Command Format	:CALCulate:EQUalization:CTLE:POLE1 <numeric> :CALCulate:EQUalization:CTLE:POLE1?
Instruction	This command sets the equalization CTLE (Continuous Time Linear Equalization) Pole1 parameter.
Parameter Type	<numeric>:represents the frequency value, and the parameter range: 0~20GHz.
Return	Float, unit: Hz
Default	1.95GHz
Menu	Setup > Adv Waveform > Equalization > Pole 1 Freq
Example	:CALC:EQU:CTLE:POLE1 2.5E9 :CALC:EQU:CTLE:POLE1? Return: 2500000000

3.22.1.5.22Equalization Pole2 Frequency

Command Format	:CALCulate:EQUalization:CTLE:POLE2 <numeric> :CALCulate:EQUalization:CTLE:POLE2?
Instruction	This command sets the equalization CTLE (Continuous Time Linear Equalization) Pole2 parameter.
Parameter Type	<numeric>:represents the frequency value, and the parameter range: 0~20GHz.
Return	Float, unit: Hz
Default	5GHz
Menu	Setup > Adv Waveform > Equalization > Pole 2 Freq
Example	:CALC:EQU:CTLE:POLE2 3E9 :CALC:EQU:CTLE:POLE2? Return: 3000000000

3.22.1.5.23Equalizer User File

Command Format	:CALCulate:EQUalization:FILename <string> :CALCulate:EQUalization:FILename?
Instruction	This command sets the filename of the equalization equation user file.
Parameter Type	<string>: represents filename.
Return	String
Default	None
Menu	Setup > Adv Waveform > Equalization > File > Load...
Example	:CALC:EQU:FIL "local/equalizer.csv" :CALC:EQU:FIL? Return: local/equalizer.csv

3.22.1.6 Hot TDR

3.22.1.6.1 Command List

Avoid Spurious	:SENSe:SPURious:AVOid:IMMediate
Hot TDR State	:SENSe:SPURious:STATe?
Spurious Data Rate	:SENSe:SPURious:INPut:DRATe
Avoid Spurious State	:SENSe:SPURious:AVOid:STATe?

3.22.1.6.2 Avoid Spurious

Command Format	:SENSe:SPURious:AVOid:IMMediate
Instruction	This command executes avoid spurious.
Parameter Type	None
Return	None
Default	None
Menu	Setup > Hot TDR > Avoid Spurious
Example	:SENS:SPUR:AVO:IMM

3.22.1.6.3 Hot TDR State

Command Format	:SENSe:SPURious:STATe?
Instruction	This command queries the Hot TDR mode status. To turn ON Hot TDR mode, use :SENSe:SPURious:AVOid:IMMediate; to turn OFF Hot TDR mode, use :SYSTem:PRESet.
Parameter Type	None
Return	Boolean
Default	OFF
Menu	None
Example	:SENS:SPUR:STAT?

3.22.1.6.4 Spurious Data Rate

Command Format	:SENSe:SPURious:INPut:DRATe <numeric> :SENSe:SPURious:INPut:DRATe?
Instruction	This command sets the value of input bit rate for avoid spurious.
Parameter Type	<numeric>:represents the value of input bit rate for avoid spurious, and the parameter range: 20Mb/s~ 2.4Gb/s.
Return	Float, unit: b/s
Default	1Gb/s
Menu	Setup > Hot TDR > Data Rate
Example	:SENS:SPUR:INP:DRAT 2e9 :SENS:SPUR:INP:DRAT? Return: 2000000000

3.22.1.6.5 Avoid Spurious State

Command Format	:SENSe:SPURious:AVOid:STATe?
Instruction	This command queries the avoid spurious state. This command is ON when :SENS:SPURious:AVOid:IMMediate command succeeds. This command is OFF when :SENS:SPURious:AVOid:IMMediate command fails to find spurious.
Parameter Type	None
Return	Boolean
Default	OFF
Menu	Setup > Hot TDR > Avoid Spurious
Example	:SENS:SPUR:AVO:STAT?

3.22.1.7 Switch Matrix

3.22.1.7.1 Command list

Ports Selection	:SENSe:SWITch:PORTs

3.22.1.7.2 Ports Selection

Command Format	:SENSe:SWITch:PORTs <pnum1>,<pnum2>…,<pnumN> :SENSe:SWITch:PORTs?
Instruction	Set or get the TDR expansion ports. The number of ports is determined by the topology of the DUT, SEND1: The number of ports is 1. SEND2|DIF1: The number of ports is 2. SEND4|DIF2: The number of ports is 4.
Parameter Type	<pnum1>: Indicates the number of the 1st Port. <pnumN>: Indicates the number of the Nth Port.
Return	Data array
Default	Determine based on the topology of the DUT, and the connection relationship between the switching matrix and the VNA.
Menu	Setup > Switch Matrix > Ports Selection
Example	:SENSe:SWITch:PORTs 1,2 :SENSe:SWITch:PORTs? Return: 1,2

3.22.2 TDR/TDT

3.22.2.1 Parameter

3.22.2.1.1 Command list

Trace Format	:CALCulate:TRACe<tnum>:FORMat
Time Domain Stimulus Type	:CALCulate:TRACe<tnum>:TIME:STIMulus
Time Domain Window Impulse Width	:CALCulate:TRACe<tnum>:TIME:IMPulse:WIDTh
Stimulus Rise Time Type	:CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:THReshold
Stimulus Rise Time	:CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:DATA

Peeling Enable	:CALCulate:TRACe<tnum>:CONVersion:PEELing:STATe

3.22.2.1.2 Trace Format

Command Format	:CALCulate:TRACe<tnum>:FORMat <type> :CALCulate:TRACe<tnum>:FORMat?
Instruction	This command sets trace format.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={MLOGarithmic|MLINear|PHASe|GDELay|SCOMplex|POLar|SWR|REAL|IMAGinary|UPHase|PPHase|SMITh|TLOGarithmic|TLINear|TREAL|IMPedance|VOLT}
Return	Enumeration
Default	Depending on the selected trace.
Menu	TDR/TDT > Parameters > Format
Example	:CALC:TRAC1:FORM VOLT :CALC:TRAC1:FORM? Return: VOLT

3.22.2.1.3 Time Domain Stimulus Type

Command Format	:CALCulate:TRACe<tnum>:TIME:STIMulus <type> :CALCulate:TRACe<tnum>:TIME:STIMulus?
Instruction	This command sets stimulus type for the transform function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={LPSTep|LPIMpulse}
Return	Enumeration
Default	LPSTep
Menu	TDR/TDT > Parameters > Stimulus

Example	:CALC:TRAC1:TIME:STIM LPIMpulse :CALC:TRAC1:TIME:STIM? Return: LPIM

3.22.2.1.4 Time Domain Window Impulse Width

Command Format	:CALCulate:TRACe<tnum>:TIME:IMPulse:WIDTh <numeric> :CALCulate:TRACe<tnum>:TIME:IMPulse:WIDTh?
Instruction	This command sets/gets the pulse width of the activation trace time domain window. This command sets/gets the pulse width of the time domain window for selecting channel and trace.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the pulse width.
Return	Float, unit s(second)
Default	None
Menu	TDR/TDT > Parameters > Impulse Width
Example	:CALC:TRAC1:TIME:IMP:WIDT 4.7E-11 :CALC:TRAC1:TIME:IMP:WIDT? Return: 7.09810588235294e-11

3.22.2.1.5 Stimulus Rise Time Type

Command Format	:CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:THReshold <type> :CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:THReshold?
Instruction	This command sets rise time threshold for the transform function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={T1_9|T2_8}
Return	Enumeration

Default	T1_9
Menu	TDR/TDT > Parameters > Rise Time
Example	:CALC:TRAC1:TIME:STEP:RTIM:THR T2_8 :CALC:TRAC1:TIME:STEP:RTIM:THR? Return: T2_8

3.22.2.1.6 Stimulus Rise Time

Command Format	:CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:DATA <numeric> :CALCulate:TRACe<tnum>:TIME:STEP:RTIMe:DATA?
Instruction	This command sets rise time value for the transform function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the rise time value.
Return	Float, unit: s (second)
Default	None
Menu	TDR/TDT > Parameters > Rise Time
Example	:CALC:TRAC1:TIME:STEP:RTIM:DATA 4.7E-11 :CALC:TRAC1:TIME:STEP:RTIM:DATA? Return: 5.24995058823529e-11

3.22.2.1.7 Peeling Enable

Command Format	:CALCulate:TRACe<tnum>:CONVersion:PEELing:STATe <bool> :CALCulate:TRACe<tnum>:CONVersion:PEELing:STATe?
Instruction	This command sets state for the peeling function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	TDR/TDT > Parameters > Peeling
Example	:CALC:TRAC1:CONV:PEEL:STAT ON :CALC:TRAC1:CONV:PEEL:STAT? Return: 1

3.22.2.2 Scale

3.22.2.2.1 Command List

Auto Scale All	:DISPlay:ATRaces:SCALe:AUTO
Horizontal Reference Position	:DISPlay:ATRaces:SCALe:RPOSition
Trace X Axis Scale	:DISPlay:TRACe<tnum>:X:SCALe:PDIVision
Trace X Axis Offset	:DISPlay:TRACe<tnum>:X:SCALe:RLEVel
Trace X Axis Auto Scale	:DISPlay:TRACe<tnum>:X:SCALe:AUTO
Trace Y Axis Scale	:DISPlay:TRACe<tnum>:Y:SCALe:PDIVision
Trace Y Axis Offset	:DISPlay:TRACe<tnum>:Y:SCALe:RLEVel
Trace Y Axis Auto Scale	:DISPlay:TRACe<tnum>:Y:SCALe:AUTO
Time Coupling Enable	:CALCulate:ATRaces:TIME:COUPle

3.22.2.2.2 Auto Scale All

Command Format	:DISPlay:ATRaces:SCALe:AUTO
Instruction	This command executes auto scale for all traces.
Parameter Type	None
Return	None
Default	None
Menu	TDR/TDT > Auto Scale > All Trace
Example	:DISP:ATR:SCAL:AUTO

3.22.2.2.3 Horizontal Reference Position

Command Format	:DISPlay:ATRaces:SCALe:RPOSition <type> :DISPlay:ATRaces:SCALe:RPOSition?
Instruction	This command sets x-axis reference position for the time domain measurement.
Parameter Type	<type>:={LEFT|CENTer}
Return	Enumeration
Default	LEFT
Menu	TDR/TDT > Horizontal > Reference Position Button
Example	:DISP:ATR:SCAL:RPOSition CENT :DISP:ATR:SCAL:RPOSition? Return: CENT

3.22.2.2.4 Trace X Axis Scale

Command Format	:DISPlay:TRACe<tnum>:X:SCALe:PDIVision <numeric> :DISPlay:TRACe<tnum>:X:SCALe:PDIVision?
Instruction	This command sets value of x-axis scale per division.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the value of x-axis scale per division.
Return	Float, unit: s (second)
Default	None
Menu	TDR/TDT > Horizontal > Scale
Example	:DISP:TRAC1:X:SCAL:PDIV 1E-9 :DISP:TRAC1:X:SCAL:PDIV? Return: 1e-09

3.22.2.2.5 Trace X Axis Offset

Command Format	:DISPlay:TRACe<tnum>:X:SCALe:RLEVel <numeric> :DISPlay:TRACe<tnum>:X:SCALe:RLEVel?
Instruction	This command sets value of x-axis reference line.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the value of x-axis reference line.
Return	Float, unit: s (second)
Default	None
Menu	TDR/TDT > Horizontal > Offset
Example	:DISP:TRAC1:X:SCAL:RLEV 2E-8 :DISP:TRAC1:X:SCAL:RLEV? Return: 2e-08

3.22.2.2.6 Trace X Axis Auto Scale

Command Format	:DISPlay:TRACe<tnum>:X:SCALe:AUTO
Instruction	This command executes x-axis auto scaling.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	TDR/TDT > Auto Scale > X
Example	:DISP:TRAC1:X:SCAL:AUTO

3.22.2.2.7 Trace Y Axis Scale

Command Format	:DISPlay:TRACe<tnum>:Y:SCALe:PDIVision <numeric> :DISPlay:TRACe<tnum>:Y:SCALe:PDIVision?
Instruction	This command sets value of y-axis scale per division.

Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the value of y-axis scale per division.
Return	Float
Default	None
Menu	TDR/TDT > Vertical > Scale
Example	:DISP:TRAC1:Y:SCAL:PDIV 10 :DISP:TRAC1:Y:SCAL:PDIV? Return: 10

3.22.2.2.8 Trace Y Axis Offset

Command Format	:DISPlay:TRACe<tnum>:Y:SCALe:RLEVel <numeric> :DISPlay:TRACe<tnum>:Y:SCALe:RLEVel?
Instruction	This command sets value of y-axis reference line.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the value of y-axis reference line.
Return	Float
Default	None
Menu	TDR/TDT > Vertical > Offset
Example	:DISP:TRAC1:Y:SCAL:RLEV 20 :DISP:TRAC1:Y:SCAL:RLEV? Return: 20

3.22.2.2.9 Trace Y Axis Auto Scale

Command Format	:DISPlay:TRACe<tnum>:Y:SCALe:AUTO
Instruction	This command executes y-axis auto scaling.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.

Return	None
Default	None
Menu	TDR/TDT > Auto Scale > Y
Example	:DISP:TRAC1:Y:SCAL:AUTO

3.22.2.2.10Time Coupling Enable

Command Format	:CALCulate:ATRaces:TIME:COUPle <bool> :CALCulate:ATRaces:TIME:COUPle?
Instruction	This command sets state for the transform couple mode.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	TDR/TDT > Trace Control > Coupling > Time
Example	:CALC:ATR:TIME:COUP OFF :CALC:ATR:TIME:COUP? Return: 0

3.22.2.3 Marker

3.22.2.3.1 Command List

Select Marker	:CALCulate:TRACe<tnum>:AMARkers:ACTive
Reference Marker Enable	:CALCulate:TRACe<tnum>:MARKer<mnum>:REFerence:STATe
Marker Coupling Enable	:CALCulate:ATRaces:MARKer:COUPle

3.22.2.3.2 Select Marker

Command Format	:CALCulate:TRACe<tnum>:AMARkers:ACTive <numeric>

	:CALCulate:TRACe<tnum>:AMARkers:ACTive?
Instruction	This command sets active marker number.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents active marker number.
Return	Integer
Default	None
Menu	TDR/TDT > Marker
Example	:CALC:TRAC1:AMAR:ACT 3 :CALC:TRAC1:AMAR:ACT? Return: 3

3.22.2.3.3 Reference Marker Enable

Command Format	:CALCulate:TRACe<tnum>:MARKer<mnum>:REFerence:STATe <bool> :CALCulate:TRACe<tnum>:MARKer<mnum>:REFerence:STATe?
Instruction	This command sets state for the reference marker display.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <mnum>:={[1]-10}, represents the marker number. If not specified, <mnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	TDR/TDT > Marker > Add Ref
Example	:CALC:TRAC1:MARK1:REF:STAT ON :CALC:TRAC1:MARK1:REF:STAT? Return: 1

3.22.2.3.4 Marker Coupling Enable

Command Format	:CALCulate:ATRaces:MARKer:COUPle <bool> :CALCulate:ATRaces:MARKer:COUPle?
Instruction	This command sets state for the marker couple mode.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	TDR/TDT > Trace Control > Coupling > Marker
Example	:CALC:ATR:MARK:COUP OFF :CALC:ATR:MARK:COUP? Return: 0

3.22.2.4 Search

3.22.2.4.1 Command List

Rise Time Search Type	:CALCulate:TRACe<tnum>:TTIMe:THReshold
Rise Time Search Enable	:CALCulate:TRACe<tnum>:TTIMe:STATe
Rise Time Search Result	:CALCulate:TRACe<tnum>:TTIMe:DATA?
Get Delta Time Search Result	:CALCulate:TRACe<tnum>:DTIMe:DATA?
Delta Time Search Position	:CALCulate:TRACe<tnum>:DTIMe:POSition
Delta Time Search Enable	:CALCulate:TRACe<tnum>:DTIMe:STATe
Delta Time Search Target	:CALCulate:TRACe<tnum>:DTIMe:TARGet

3.22.2.4.2 Rise Time Search Type

Command Format	:CALCulate:TRACe<tnum>:TTIMe:THReshold <type> :CALCulate:TRACe<tnum>:TTIMe:THReshold?
Instruction	This command sets the rise time threshold for the rise time in the marker search function.

Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={T1_9|T2_8}
Return	Enumeration
Default	T1_9
Menu	TDR/TDT > Marker Search > Rise Time(10-90%)/Rise Time(20-80%)
Example	:CALC:TRAC1:TTIM:THR T2_8 :CALC:TRAC1:TTIM:THR? Return: T2_8

3.22.2.4.3 Rise Time Search Enable

Command Format	:CALCulate:TRACe<tnum>:TTIMe:STATe <bool> :CALCulate:TRACe<tnum>:TTIMe:STATe?
Instruction	This command displays the rise time marker.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	TDR/TDT > Marker Search > Rise Time(10-90%)/Rise Time(20-80%)
Example	:CALC:TRAC1:TTIM:STAT ON :CALC:TRAC1:TTIM:STAT? Return: 1

3.22.2.4.4 Rise Time Search Result

Command Format	:CALCulate:TRACe<tnum>:TTIMe:DATA?
Instruction	This command returns the rise time result value for marker search. You can get the data even if Rise Time Search is off.

Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: s (second)
Default	None
Menu	None
Example	:CALC:TRAC1:TTIM:DATA?

3.22.2.4.5 Get Delta Time Search Result

Command Format	:CALCulate:TRACe<tnum>:DTIMe:DATA?
Instruction	This command gets delta time result value. You can get the result even if Delta Time Search is off.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	Float, unit: s (second)
Default	None
Menu	None
Example	:CALC:TRAC1:DTIM:DATA?

3.22.2.4.6 Delta Time Search Position

Command Format	:CALCulate:TRACe<tnum>:DTIMe:POSition <numeric> :CALCulate:TRACe<tnum>:DTIMe:POSition?
Instruction	This command sets delta time reference position.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents delta time reference position, and the parameter range: 0 ~ 100.
Return	Float, unit: %
Default	50

Menu	TDR/TDT > Srearch > ΔTime... > Position (%)
Example	:CALC:TRAC1:DTIM:POS 20 :CALC:TRAC1:DTIM:POS? Return: 20

3.22.2.4.7 Delta Time Search Enable

Command Format	:CALCulate:TRACe<tnum>:DTIMe:STATe <bool> :CALCulate:TRACe<tnum>:DTIMe:STATe?
Instruction	This command displays the delta time marker in the marker search.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	TDR/TDT > Srearch > ΔTime... > ΔTime Enable
Example	:CALC:TRAC1:DTIM:STAT ON :CALC:TRAC1:DTIM:STAT? Return: 1

3.22.2.4.8 Delta Time Search Target

Command Format	:CALCulate:TRACe<tnum>:DTIMe:TARGet <numeric> :CALCulate:TRACe<tnum>:DTIMe:TARGet?
Instruction	This command sets target trace number for the delta time function. The <tnum>is the trace number starting point for delta time. The <numeric> is the trace number stopping point for delta time.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents target trace number.

Return	Integer
Default	Depending on the selected trace.
Menu	TDR/TDT > Srearch > ΔTime... > Target(Stop)
Example	:CALC:TRAC1:DTIM:TARG 5 :CALC:TRAC1:DTIM:TARG? Return: 5

3.22.2.5 Gating

3.22.2.5.1 Command List

Gating Start	:CALCulate:TRACe<tnum>:GATE:STARt
Gating Stop	:CALCulate:TRACe<tnum>:GATE:STOP
Gating Enable	:CALCulate:TRACe<tnum>:GATE:STATe
Gating Type	:CALCulate:TRACe<tnum>:GATE:TYPE

3.22.2.5.2 Gating Start

Command Format	:CALCulate:TRACe<tnum>:GATE:STARt <numeric> :CALCulate:TRACe<tnum>:GATE:STARt?
Instruction	This command sets start value for the gating function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the start value for the gating function .
Return	Float, unit: s (second)
Default	None
Menu	TDR/TDT > Gating > Start
Example	:CALC:TRAC1:GATE:STAR 2E-9 :CALC:TRAC1:GATE:STAR? Return: 2e-09

3.22.2.5.3 Gating Stop

Command Format	:CALCulate:TRACe<tnum>:GATE:STOP <numeric> :CALCulate:TRACe<tnum>:GATE:STOP?
Instruction	This command sets stop value for the gating function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the stop value for the gating function .
Return	Float, unit: s (second)
Default	None
Menu	TDR/TDT > Gating > Stop
Example	:CALC:TRAC1:GATE:STOP 6E-9 :CALC:TRAC1:GATE:STOP? Return: 6e-09

3.22.2.5.4 Gating Enable

Command Format	:CALCulate:TRACe<tnum>:GATE:STATe <bool> :CALCulate:TRACe<tnum>:GATE:STATe?
Instruction	This command sets state for the gating function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	TDR/TDT > Gating > Gating
Example	:CALC:TRAC1:GATE:STAT ON :CALC:TRAC1:GATE:STAT? Return: 1

3.22.2.5.5 Gating Type

Command Format	:CALCulate:TRACe<tnum>:GATE:TYPE <type> :CALCulate:TRACe<tnum>:GATE:TYPE?
Instruction	This command sets gate type for the gating function.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={BPASs|NOTCh}
Return	Enumeration
Default	BPASs
Menu	TDR/TDT > Gating > Type > Notch/Bandpass
Example	:CALC:TRAC1:GATE:TYPE NOTC :CALC:TRAC1:GATE:TYPE? Return: NOTC

3.22.2.6 Memory

3.22.2.6.1 Command List

Trace Display Type	:DISPlay:TRACe<tnum>:DMEMory:TYPE

3.22.2.6.2 Trace Display Type

Command Format	:DISPlay:TRACe<tnum>:DMEMory:TYPE <type> :DISPlay:TRACe<tnum>:DMEMory:TYPE?
Instruction	This command sets type of data/memory display.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={OFF|DATA|MEMory|DMEMory}
Return	Enumeration

Default	DATA
Menu	TDR/TDT > Data/Mem > Off/Data/Memory/Data&Memory
Example	:DISP:TRAC1:DMEM:TYPE DMEMory :DISP:TRAC1:DMEM:TYPE? Return: DMEM

3.22.2.7 Trace Control

3.22.2.7.1 Command List

Trace Count	:CALCulate:ATRaces:COUNt?
Select Trace	:CALCulate:ATRaces:ACTive
Trace Measure Parameter	:CALCulate:TRACe<tnum>:PARameter
Trace Allocation	:CALCulate:ALLocate
Trigger Mode	:TRIGger:MODE

3.22.2.7.2 Trace Count

Command Format	:CALCulate:ATRaces:COUNt?
Instruction	This command returns the number of trace.
Parameter Type	None
Return	Integer
Default	Depending on DUT topology setting
Menu	None
Example	:CALC:ATR:COUN?

3.22.2.7.3 Select Trace

Command Format	:CALCulate:ATRaces:ACTive <numeric> :CALCulate:ATRaces:ACTive?

Instruction	This command sets/gets active trace number.
Parameter Type	<numeric>:represents the active trace number.
Return	Integer
Default	None
Menu	TDR/TDT > Trace
Example	:CALC:ATR:ACT 6 :CALC:ATR:ACT? Return: 6

3.22.2.7.4 Trace Measure Parameter

Command Format	:CALCulate:TRACe<tnum>:PARameter <string> :CALCulate:TRACe<tnum>:PARameter?
Instruction	This command sets measurement parameter.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <string>:Txy|Tddxy|Tdcxy|Tcdxy|Tccxy|Sxy|Sddxy|Sdcxy|Scdxy|Sccxy , x=1~4, y=1~4
Return	String
Default	Depending on the trace and DUT topology.
Menu	TDR/TDT > Parameter
Example	:CALC:TRAC2:PAR T11 :CALC:TRAC2:PAR? Return: T11

3.22.2.7.5 Trace Allocation

Command Format	:CALCulate:ALLocate <type>
Instruction	This command sets type of the parameter & format allocation for each

	trace.
Parameter Type	<type>:={SPARameters|TPARameters|MIXed}
Return	None
Default	MIXed
Menu	TDR/TDT > Trace Control > Allocation > Mixed/All T/All S
Example	:CALCulate:ALLocate SPAR

3.22.2.7.6 Trigger Mode

Command Format	:TRIGger:MODE <type> :TRIGger:MODE?
Instruction	This command sets/gets trigger mode.
Parameter Type	<type>:={HOLD|SINGle|RUN}
Return	Enumeration
Default	RUN
Menu	TDR/TDT > Run/Stop/Single
Example	:TRIG:MODE HOLD :TRIG:MODE? Return: HOLD

3.22.2.8 DC

3.22.2.8.1 Command List

TDR Auto Extrapolate	:CALCulate:TRACe<tnum>:DCSParam:AUTO
TDR manual Extrapolate value	:CALCulate:TRACe<tnum>:DCSParam
Set TDR Auto Extrapolate to manual value	:CALCulate:TRACe<tnum>:DCSParam:EXTRapolate

3.22.2.8.2 TDR Auto Extrapolate

Command Format	:CALCulate:TRACe<tnum>:DCSParam:AUTO <bool> :CALCulate:TRACe<tnum>:DCSParam:AUTO?
Instruction	sets/gets the TDR automatic DC extrapolation mode.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	TDR/TDT > DC > Auto Extrapolate
Example	:CALCulate:TRACe1:DCSParam:AUTO OFF :CALCulate:TRACe1:DCSParam:AUTO? Return :0

3.22.2.8.3 TDR manual Extrapolate value

Command Format	:CALCulate:TRACe<tnum>:DCSParam <numeric> :CALCulate:TRACe<tnum>:DCSParam?
Instruction	sets/gets the TDR DC extrapolation mode to manual of selected trace.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>:represents the DC extrapolation value, and the parameter range: -1E15~1E15.
Return	Float
Default	1
Menu	TDR/TDT > DC > Manual Entry
Example	:CALCulate:TRACe1:DCSParam 10 :CALCulate:TRACe1:DCSParam? Return:10

3.22.2.8.4 Set TDR Auto Extrapolate to manual value

Command Format	:CALCulate:TRACe<tnum>:DCSParam:EXTRapolate
Instruction	Sets the TDR automatic DC extrapolation value to manual value of selected trace.
Parameter Type	<tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1.
Return	None
Default	None
Menu	TDR/TDT > DC > Extrapolate
Example	:CALCulate:TRACe1:DCSParam:EXTRapolate

3.22.3 Eye/Mask

3.22.3.1 Stimulus

3.22.3.1.1 Command List

Eye Diagram Display Switch	:CALCulate:EYE:STATe
Draw Eye Diagram	:CALCulate:EYE:EXECute
Abort Eye Diagram Drawing	:CALCulate:EYE: ABORt
Bit Pattern Type	:CALCulate:EYE:INPut:BPATtern:TYPE
Load User Bit Pattern	:MMEMory:LOAD:EYE:BPATtern
Bit Pattern Length	:CALCulate:EYE:INPut:BPATtern:LENGth
Input Data Rate	:CALCulate:EYE:INPut:DRATe
Input One Level	:CALCulate:EYE:INPut:OLEVel
Input Zero Level	:CALCulate:EYE:INPut:ZLEVel
Input Rise Time Type	:CALCulate:EYE:INPut:RTIMe:THReshold
Input Rise Time	:CALCulate:EYE:INPut:RTIMe:DATA
Jitter Display Limit	:CALCulate:EYE:INPut:JITTer:DLIMit

3.22.3.1.2 Eye Diagram Display Switch

Command Format	:CALCulate:EYE:STATe <bool> :CALCulate:EYE:STATe?
Instruction	This command displays the EYE/MASK window.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	None
Example	:CALC:EYE:STAT OFF :CALC:EYE:STAT?

3.22.3.1.3 Draw Eye Diagram

Command Format	:CALCulate:EYE:EXECute
Instruction	This command performs the calculation for the simulated eye diagram for the active trace.
Parameter Type	None
Return	None
Default	None
Menu	Eye/Mask > Trigger > Draw Eye
Example	:CALC:EYE:EXEC

3.22.3.1.4 Abort Eye Diagram Drawing

Command Format	:CALCulate:EYE:ABORt
Instruction	This command aborts the calculation for the simulated eye diagram.
Parameter Type	None
Return	None

Default	None
Menu	Eye/Mask > Trigger > Abort
Example	:CALC:EYE:ABOR

3.22.3.1.5 Bit Pattern Type

Command Format	:CALCulate:EYE:INPut:BPATtern:TYPE <type> :CALCulate:EYE:INPut:BPATtern:TYPE?
Instruction	This command sets the bit pattern type for the simulated eye function.
Parameter Type	<type>:={PRBS|K285|USER|STAT}
Return	Enumeration
Default	PRBS
Menu	Eye/Mask > Stimulus > Type
Example	:CALC:EYE:INP:BPAT:TYPE K285 :CALC:EYE:INP:BPAT:TYPE? Return: K285

3.22.3.1.6 Load User Bit Pattern

Command Format	:MMEMory:LOAD:EYE:BPATtern <string>
Instruction	This command loads the specified user bit pattern file. The extension of file should be .txt.
Parameter Type	<string>: represents the specified user bit pattern file(.txt).
Return	None
Default	None
Menu	Eye/Mask > Stimulus > User Pattern > Load
Example	:MMEM:LOAD:EYE:BPAT "local/userbit.txt"

3.22.3.1.7 Bit Pattern Length

Command Format	:CALCulate:EYE:INPut:BPATtern:LENGth <numeric> :CALCulate:EYE:INPut:BPATtern:LENGth?
Instruction	This command sets bits' power of 2 for PRBS pattern. This value is used only when the bit pattern type is selected at PRBS.
Parameter Type	<numeric>:represents the Bit Pattern Length for PRBS pattern, and the parameter range: 3, 5, 7, 9, 11, 13, 15.
Return	Discrete
Default	7
Menu	Eye/Mask > Stimulus > Length
Example	:CALC:EYE:INP:BPAT:LENG 3 :CALC:EYE:INP:BPAT:LENG? Return: 3

3.22.3.1.8 Input Data Rate

Command Format	:CALCulate:EYE:INPut:DRATe <numeric> :CALCulate:EYE:INPut:DRATe?
Instruction	This command sets the bit rate for the simulated eye function.
Parameter Type	<numeric>:represents the bit rate, and the parameter range: 100Mb/s ~ 2.4Gb/s.
Return	Float, unit: b/s (bits/second)
Default	1Gb/s
Menu	Eye/Mask > Stimulus > Date Rate
Example	:CALC:EYE:INP:DRAT 1.2E9 :CALC:EYE:INP:DRAT? Return: 1200000000

3.22.3.1.9 Input One Level

Command Format	:CALCulate:EYE:INPut:OLEVel <numeric> :CALCulate:EYE:INPut:OLEVel?
Instruction	This command sets the voltage level for bit "1" for the simulated eye function.
Parameter Type	<numeric>:represents the voltage level, and the parameter range: -5 ~ 5 V.
Return	Float, unit: V (Voltage)
Default	0.2V
Menu	Eye/Mask > Stimulus > One Level
Example	:CALC:EYE:INP:OLEV -0.2 :CALC:EYE:INP:OLEV? Return: -0.2

3.22.3.1.10Input Zero Level

Command Format	:CALCulate:EYE:INPut:ZLEVel <numeric> :CALCulate:EYE:INPut:ZLEVel?
Instruction	This command sets the voltage level for bit "0" for the simulated eye function.
Parameter Type	<numeric>:represents the voltage level, and the parameter range: -5 ~ 5 V.
Return	Float, unit: V (Voltage)
Default	0 V
Menu	Eye/Mask > Stimulus > Zero Level
Example	:CALC:EYE:INP:ZLEV 0.5 :CALC:EYE:INP:ZLEV? Return: 0.5

3.22.3.1.11Input Rise Time Type

Command Format	:CALCulate:EYE:INPut:RTIMe:THReshold <type> :CALCulate:EYE:INPut:RTIMe:THReshold?
Instruction	This command sets the rise time threshold for the simulated eye.
Parameter Type	<type>:={T1_9|T2_8}
Return	Enumeration
Default	T1_9
Menu	Eye/Mask > Stimulus > Rise Time
Example	:CALC:EYE:INP:RTIM:THR T2_8 :CALC:EYE:INP:RTIM:THR? Return: T2_8

3.22.3.1.12Input Rise Time

Command Format	:CALCulate:EYE:INPut:RTIMe:DATA <numeric> :CALCulate:EYE:INPut:RTIMe:DATA?
Instruction	This command sets the rise time value for the simulated eye function.
Parameter Type	<numeric>:represents the rise time value, and the parameter range: depending on input data rate.
Return	Float, unit: s (second)
Default	Depending on input data rate.
Menu	Eye/Mask > Stimulus > Rise Time
Example	:CALC:EYE:INP:RTIM:DATA 90e-12 :CALC:EYE:INP:RTIM:DATA? Return: 9e-11

3.22.3.1.13Jitter Display Limit

Command Format	:CALCulate:EYE:INPut:JITTer:DLIMit <numeric> :CALCulate:EYE:INPut:JITTer:DLIMit?

Instruction	This command sets/gets the display limit value.
Parameter Type	<numeric>:represents the display limit value, and the parameter range: 0~1.
Return	Float
Default	1E-8
Menu	Eye/Mask > Advanced Waveform > Jitter > Display Limit
Example	:CALC:EYE:INP:JITT:DLIM 10E-10 :CALC:EYE:INP:JITT:DLIM? Return: 1e-09

3.22.3.2 Result

3.22.3.2.1 Command List

Eye Diagram Result Overlay	:CALCulate:EYE:RESults:DISPlay:STATe
Eye Diagram Result Rise Time Type	:CALCulate:EYE:RESults:THReshold

3.22.3.2.2 Eye Diagram Result Overlay

Command Format	:CALCulate:EYE:RESults:DISPlay:STATe <bool> :CALCulate:EYE:RESults:DISPlay:STATe?
Instruction	This command turns the overlay on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	ON
Menu	Eye/Mask > Resul > Overlay
Example	:CALC:EYE:RES:DISP:STAT OFF :CALC:EYE:RES:DISP:STAT? Return: 0

3.22.3.2.3 Eye Diagram Result Rise Time Type

Command Format	:CALCulate:EYE:RESults:THReshold <type> :CALCulate:EYE:RESults:THReshold?
Instruction	This command sets the rise time threshold level for the results of eye measurement.
Parameter Type	<type>:={T1_9|T2_8}
Return	Enumeration
Default	T1_9
Menu	Eye/Mask > Resul > Rise Time Def
Example	:CALC:EYE:RES:THR T2_8 :CALC:EYE:RES:THR? Return: T2_8

3.22.3.3 Scale

3.22.3.3.1 Command List

Eye Diagram Scale Auto	:DISPlay:EYE:Y:SCALe:AUTO
Eye Diagram Scale Manual	:DISPlay:EYE:Y:SCALe:MANual
Eye Diagram Scale	:DISPlay:EYE:Y:SCALe:PDIVision
Eye Diagram Offset	:DISPlay:EYE:Y:SCALe:RLEVel
Mask Test Enable	:CALCulate:EYE:MASK:STATe
Mask Test Result	:CALCulate:EYE:MASK:FAIL?
Eye Diagram Result Data	:CALCulate:EYE:RESults:DATA?
Load User Mask Pattern	:MMEMory:LOAD:EYE:MASK

3.22.3.3.2 Eye Diagram Scale Auto

Command Format	:DISPlay:EYE:Y:SCALe:AUTO
Instruction	This command executes Y axis auto scaling for eye diagram.

Parameter Type	None
Return	None
Default	None
Menu	Eye/Mask > Scale/Mask > Auto Scale
Example	:DISP:EYE:Y:SCAL:AUTO

3.22.3.3.3 Eye Diagram Scale Manual

Command Format	:DISPlay:EYE:Y:SCALe:MANual
Instruction	This command changes the eye diagram scaling to manual mode. This command should be executed before the :DISPlay:EYE:Y:SCALe:PDIVision or :DISPlay:EYE:Y:SCALe:RLEVel commands are sent.
Parameter Type	None
Return	None
Default	None
Menu	Eye/Mask > Scale/Mask > Manual
Example	:DISP:EYE:Y:SCAL:MAN

3.22.3.3.4 Eye Diagram Scale

Command Format	:DISPlay:EYE:Y:SCALe:PDIVision <numeric> :DISPlay:EYE:Y:SCALe:PDIVision?
Instruction	This command sets value of y-axis scale per division for eye diagram. The scale mode should be set at manual by the :DISPlay:EYE:Y:SCALe:MANual before this command is executed.
Parameter Type	<numeric>:represents the value of y-axis scale.
Return	Float, unit: V (Voltage)
Default	133mV

Menu	Eye/Mask > Scale/Mask > Scale/Div
Example	:DISP:EYE:Y:SCAL:PDIV 300E-03 :DISP:EYE:Y:SCAL:PDIV? Return: 0.3

3.22.3.3.5 Eye Diagram Offset

Command Format	:DISPlay:EYE:Y:SCALe:RLEVel <numeric> :DISPlay:EYE:Y:SCALe:RLEVel?
Instruction	This command sets value of eye diagram y-axis reference line. The scale mode should be set at manual by the :DISPlay:EYE:Y:SCALe:MANual before this command is executed.
Parameter Type	<numeric>:represents the value of eye diagram y-axis reference line.
Return	Float, unit: V (Voltage)
Default	0
Menu	Eye/Mask > Scale/Mask > Offset
Example	:DISP:EYE:Y:SCAL:RLEV 0.5 :DISP:EYE:Y:SCAL:RLEV? Return: 0.5

3.22.3.3.6 Mask Test Enable

Command Format	:CALCulate:EYE:MASK:STATe <bool> :CALCulate:EYE:MASK:STATe?
Instruction	This command sets mask test with simulated eye on/off.
Parameter Type	<bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Eye/Mask > Scale/Mask > Mask Test

Example	:CALC:EYE:MASK:STAT ON :CALC:EYE:MASK:STAT? Return: 1

3.22.3.3.7 Mask Test Result

Command Format	:CALCulate:EYE:MASK:FAIL?
Instruction	This command returns the mask test result.
Parameter Type	None
Return	Boolean
Default	None
Menu	None
Example	:CALC:EYE:MASK:FAIL?

3.22.3.3.8 Eye Diagram Result Data

Command Format	:CALCulate:EYE:RESults:DATA?
Instruction	This command returns the results of eye measurement. The 18 values are returned. The minimum and maximum values are returned in addition of the displayed results (16 values) on the TDR application GUI.
Parameter Type	None
Return	String
Default	None
Menu	Eye/Mask > Result
Example	:CALC:EYE:RES:DATA?

3.22.3.3.9 Load User Mask Pattern

Command Format	:MMEMory:LOAD:EYE:MASK <string>
Instruction	This command loads eye-mask file. The extension of file should be .msk. The MASK pattern editing is not available through the

	command.
Parameter Type	<string>: represents file name of eye mask (.msk).
Return	None
Default	None
Menu	Eye/Mask > Scale/Mask > Mask Pattern > Use User-defined mask files > Load
Example	:MMEM:LOAD:EYE:MASK "local/usermask.msk"

3.23 CAT Commands(Only support SHN900A series models)

3.23.1 Command List

Start Frequency	:SENSe<cnum>:CAT:FREQuency:STARt
Stop Frequency	:SENSe<cnum>:CAT:FREQuency:STOP
Start Distance	:CALCulate<cnum>:CAT:TRANsform:DISTance:STARt
Stop Distance	:CALCulate<cnum>:CAT:TRANsform:DISTance:STOP
Unit Type	:CALCulate<cnum>:CAT:TRANsform:DISTance:UNIT
Coax Loss	:SENSe<cnum>:CAT:CORRection:LOSS:COAX
TDT Stimulus Type	:CALCulate<cnum>:TRACe<tnum>:CAT:TRANsform:STIMulus:TYPE
TDT Window Type	:CALCulate<cnum>:TRACe<tnum>:DTF:TRANsform:WINDow
Kaiser Beta	:CALCulate<cnum>:TRACe<tnum>:CAT:WINDow:BETA
TDT Gate Start Distance	:CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STARt
TDT Gate Stop Distance	:CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STOP

3.23.2 Start Frequency

Command Format	:SENSe<cnum>:CAT:FREQuency:STARt <numeric> :SENSe<cnum>:CAT:FREQuency:STARt?
Instruction	This command sets or gets the starting frequency of the selected

	channel in CAT mode
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the start frequency.
Return	Float, Unit Hz.
Default	1MHz
Menu	Frequency/Distance > Start Frequency
Example	:SENSe1:CAT:FREQuency:STARt 100e3 :SENSe1:CAT:FREQuency:STARt? Return: 100000

3.23.3 Stop Frequency

Command Format	:SENSe<cnum>:CAT:FREQuency:STOP <numeric> :SENSe<cnum>:CAT:FREQuency:STOP?
Instruction	This command sets or gets the starting frequency of the selected channel in CAT mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the stop frequency.
Return	Float, Unit Hz.
Default	200MHz
Menu	Frequency/Distance > Stop Frequency
Example	:SENSe1:CAT:FREQuency:STOP 1e9 :SENSe1:CAT:FREQuency:STOP? Return: 1000000000

3.23.4 Start Distance

Command Format	:CALCulate<cnum>:CAT:TRANsform:DISTance:STARt <numeric>

	:CALCulate<cnum>:CAT:TRANsform:DISTance:STARt?
Instruction	This command sets or gets the starting distance of the DTF/TDR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the start distance, the range is zero to max measure distance.
Return	Float
Default	0 m
Menu	Frequency/Distance > Start Distance
Example	:CALCulate1:CAT:TRANsform:DISTance:STARt 1.26 :CALCulate1:CAT:TRANsform:DISTance:STARt? Return: 1.26

3.23.5 Stop Distance

Command Format	:CALCulate<cnum>:CAT:TRANsform:DISTance:STOP <numeric> :CALCulate<cnum>:CAT:TRANsform:DISTance:STOP?
Instruction	This command sets or gets the stopping distance of the DTF/TDR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the stop distance, the range is zero to max measure distance.
Return	Float
Default	100 m
Menu	Frequency/Distance > Stop Distance

Example	:CALCulate1:CAT:TRANsform:DISTance:STOP 3.26 :CALCulate1:CAT:TRANsform:DISTance:STOP? Return: 3.26

3.23.6 Unit Type

Command Format	:CALCulate<cnum>:CAT:TRANsform:DISTance:UNIT <type> :CALCulate<cnum>:CAT:TRANsform:DISTance:UNIT?
Instruction	This command sets or gets the unit of the DTF/TDR distance measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={METer|FEET|INCH}.
Return	Enum
Default	METer
Menu	Frequency/Distance > Unit
Example	:CALCulate1:CAT:TRANsform:DISTance:UNIT FEET :CALCulate1:CAT:TRANsform:DISTance:UNIT? Return: FEET

3.23.7 Coax Loss

Command Format	:SENSe<cnum>:CAT:CORRection:LOSS:COAX <numeric> :SENSe<cnum>:CAT:CORRection:LOSS:COAX?
Instruction	This command sets or gets the coax loss of the DTF/TDR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>:represents the coax loss, the unit is dB/m.

Return	Float, Unit dB/m
Default	0dB/m
Menu	Meas > Meas Setup > Coax Loss
Example	:SENSe1:CAT:CORRection:LOSS:COAX 1.5 :SENSe1:CAT:CORRection:LOSS:COAX? Return: 1.5

3.23.8 TDT Stimulus Type

Command Format	:CALCulate<cnum>:TRACe<tnum>:CAT:TRANsform:STIMulus:TYPE <type> :CALCulate<cnum>:TRACe<tnum>:CAT:TRANsform:STIMulus:TYPE?
Instruction	This command sets or gets the stimulus type of the DTF/TDR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={BPASs|LPASs}.
Return	Enum
Default	LPASs
Menu	Meas > Meas Setup > Stimulus Type
Example	:CALCulate1:TRACe1:CAT:TRANsform:STIMulus:TYPE BPASs :CALCulate1:TRACe1:CAT:TRANsform:STIMulus:TYPE? Return: BPAS

3.23.9 TDT Window Type

Command Format	:CALCulate<cnum>:TRACe<tnum>:DTF:TRANsform:WINDow <type>

	:CALCulate<cnum>:TRACe<tnum>:DTF:TRANsform:WINDow?
Instruction	This command sets or gets the window type of the DTF/TDR measurement. Note: Only in bandpass mode can the window type be customized.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <type>:={OFF|KAISer|HAMMing}.
Return	Enum
Default	OFF
Menu	Meas > Distance to Fault > Meas Setup> DTF window
Example	:CALCulate1:TRACe1:DTF:TRANsform:WINDow HAMMing :CALCulate1:TRACe1:DTF:TRANsform:WINDow? Return: HAMM

3.23.10 Kaiser Beta

Command Format	:CALCulate<cnum>:TRACe<tnum>:CAT:WINDow:BETA <numeric> :CALCulate<cnum>:TRACe<tnum>:CAT:WINDow:BETA?
Instruction	This command sets or gets the kaiser beta value of the DTF/TDR measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the kaiser beta value, the range is zero to thirteen.
Return	Float
Default	6
Menu	Meas > Distance to Fault > Meas Setup> Kaiser Beta

Example	:CALCulate1:TRACe1:CAT:WINDow:BETA 3.4 :CALCulate1:TRACe1:CAT:WINDow:BETA? Return: 3.4

3.23.11 TDT Gate Start Distance

Command Format	:CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STARt <numeric> :CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STARt?
Instruction	This command sets or gets the time domain function of TDR measurement to select the starting distance.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the gate start distance, the range is zero to max measure distance.
Return	Float
Default	0 m
Menu	Meas > TDR > Meas Setup > Time Domain > Start
Example	:CALCulate1:TRACe1:TDR:GATE:DISTance:STARt 2.0 :CALCulate1:TRACe1:TDR:GATE:DISTance:STARt? Return: 2

3.23.12 TDT Gate Stop Distance

Command Format	:CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STOP <numeric> :CALCulate<cnum>:TRACe<tnum>:TDR:GATE:DISTance:STOP?
Instruction	This command sets or gets the time domain function of TDR

	measurement to select the stopping distance.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <tnum>:={[1]-256}, represents the measurement trace number. If not specified, <tnum> defaults to 1. <numeric>: represents the gate stop distance, the range is zero to max measure distance.
Return	Float
Default	100 m
Menu	Meas > TDR > Meas Setup > Time Domain > Stop
Example	:CALCulate1:TRACe1:TDR:GATE:DISTance:STOP 51.2 :CALCulate1:TRACe1:TDR:GATE:DISTance:STOP? Return: 51.2

3.24 Material Measurement Commands(Option)

3.24.1 Command List

Height of Sample	:CALCulate<cnum>:MATerial:SAMPle:HEIGht
Length of Sample	:CALCulate<cnum>:MATerial:SAMPle:LENGth
Distance from Sample to Calibration Plane	:CALCulate<cnum>:MATerial:DISTance
Initializing Waveguide Params	:CALCulate<cnum>:MATerial:WAVeguide:INIt
Query Waveguide Information	:CALCulate<cnum>:MATerial:WAVeguide:CATalog?
Height of Waveguide	:CALCulate<cnum>:MATerial:WAVeguide:HEIGht
Width of Waveguide	:CALCulate<cnum>:MATerial:WAVeguide:WIDTh
Length of Waveguide	:CALCulate<cnum>:MATerial:WAVeguide:LENGth
Air Gap Correction	:CALCulate<cnum>:MATerial:GAP:CORRection
Measurement Model	:CALCulate<cnum>:MATerial:MODel
Calculate Type	:CALCulate<cnum>:MATerial:DIRection
Estimation of Permittivity	:CALCulate<cnum>:MATerial:ESTimate:EPSilon
Port for Material Measurement	:SENSe<cnum>:MATerial:PMAP

3.24.2 Height of Sample

Command Format	:CALCulate<cnum>:MATerial:SAMPle:HEIGht <numeric> :CALCulate<cnum>:MATerial:SAMPle:HEIGht?
Instruction	This command set or get the sample height of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the height of sample.
Return	Float, unit:m
Default	0m
Menu	Meas > Meas Setup > Meas Setup > Waveguide Gap Correction > Small Width Of Sample
Example	:CALCulate1:MATerial:SAMPle:HEIGht 3 :CALCulate1:MATerial:SAMPle:HEIGht? Return: 3

3.24.3 Length of Sample

Command Format	:CALCulate<cnum>:MATerial:SAMPle:LENGth <numeric> :CALCulate<cnum>:MATerial:SAMPle:LENGth?
Instruction	This command set or get the sample length of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the length of sample.
Return	Float, unit:m
Default	10mm
Menu	Meas > Meas Setup > Meas Setup > Sample Holder > Sample Thickness

Example	:CALCulate1:MATerial:SAMPle:LENGth 0.05 :CALCulate1:MATerial:SAMPle:LENGth? Return: 0.05

3.24.4 Distance from Sample to Calibration Plane

Command Format	:CALCulate<cnum>:MATerial:DISTance <numeric> :CALCulate<cnum>:MATerial:DISTance?
Instruction	This command set or get the distance from sample to calibration plane of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the distance from sample to calibration plane.
Return	Float, unit:m
Default	0m
Menu	Meas > Meas Setup > Meas Setup > Sample Holder > Distance To Sample
Example	:CALCulate1:MATerial:DISTance 0.7 :CALCulate1:MATerial:DISTance? Return: 0.7

3.24.5 Initializing Waveguide Params

Command Format	:CALCulate<cnum>:MATerial:WAVeguide:INIt <type>
Instruction	Initialize waveguide related parameters according to the waveguide type, and the initialized parameters include: Start Freq, Stop Freq, Cutoff Frequency, Waveguide Width and Small Width Of Waveguide.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={X|P|K|Q|R|U|V|W}
Return	Enumeration

Default	None
Menu	Meas > Meas Setup > Meas Setup > Preset > Lookup… > Lookup Table
Example	:CALCulate1:MATerial:WAVeguide:INIt X

3.24.6 Query Waveguide Information

Command Format	:CALCulate<cnum>:MATerial:WAVeguide:CATalog?
Instruction	Query all waveguide information saved by material measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	String
Default	"X,P,K,R,Q,U,V,W"
Menu	Meas > Meas Setup > Meas Setup > Preset > Lookup… > Lookup Table
Example	:CALCulate1:MATerial:WAVeguide:CATalog? Return: "X,P,K,R,Q,U,V,W"

3.24.7 Height of Waveguide

Command Format	:CALCulate<cnum>:MATerial:WAVeguide:HEIGht <numeric> :CALCulate<cnum>:MATerial:WAVeguide:HEIGht?
Instruction	This command set or get the waveguide height of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the height of waveguide.
Return	Float, unit:m
Default	0m
Menu	Meas > Meas Setup > Meas Setup > Waveguide Gap Correction > Small Width Of Waveguide
Example	:CALCulate1:MATerial:WAVeguide:HEIGht 0.1

	:CALCulate1:MATerial:WAVeguide:HEIGht? Return: 0.1

3.24.8 Width of Waveguide

Command Format	:CALCulate<cnum>:MATerial:WAVeguide:WIDTh <numeric> :CALCulate<cnum>:MATerial:WAVeguide:WIDTh?
Instruction	This command set or get the waveguide width of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the width of waveguide.
Return	Float, unit:m
Default	20mm
Menu	Meas > Meas Setup > Meas Setup >Sample Holder > Waveguide > Waveguide Width
Example	:CALCulate1:MATerial:WAVeguide:WIDTh 0.3 :CALCulate1:MATerial:WAVeguide:WIDTh? Return: 0.3

3.24.9 Length of Waveguide

Command Format	:CALCulate<cnum>:MATerial:WAVeguide:LENGth <numeric> :CALCulate<cnum>:MATerial:WAVeguide:LENGth?
Instruction	This command set or get the waveguide length of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric>:represents the length of waveguide.
Return	Float, unit:m
Default	100mm
Menu	Meas > Meas Setup > Meas Setup > Sample Holder > Sample Holder

	Length
Example	:CALCulate1:MATerial:WAVeguide:LENGth 0.4 :CALCulate1:MATerial:WAVeguide:LENGth? Return: 0.4

3.24.10 Air Gap Correction

Command Format	:CALCulate<cnum>:MATerial:GAP:CORRection <bool> :CALCulate<cnum>:MATerial:GAP:CORRection?
Instruction	This command set or get the waveguide air gap correction status of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	0
Menu	Meas > Meas Setup > Meas Setup > Waveguide Gap Correction > Correction On
Example	:CALCulate1:MATerial:GAP:CORRection ON :CALCulate1:MATerial:GAP:CORRection? Return: 1

3.24.11 Measurement Model

Command Format	:CALCulate<cnum>:MATerial:MODel <type> :CALCulate<cnum>:MATerial:MODel?
Instruction	This command set or get the measurement model of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={NRW|NIST|FNRW}

Return	Enumeration
Default	NIST
Menu	Meas > Meas Setup > Meas Setup > Measurement Model > Measurement Model
Example	:CALCulate1:MATerial:MODel NRW :CALCulate1:MATerial:MODel? Return: NRW

3.24.12 Calculate Type

Command Format	:CALCulate<cnum>:MATerial:DIRection <type> :CALCulate<cnum>:MATerial:DIRection?
Instruction	This command set or get the calculate type of the selected channel.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <type>:={AVG|FWD|REV}
Return	Enumeration
Default	AVG
Menu	Meas > Meas Setup > Meas Setup > Measurement Model > Calculate Type
Example	:CALCulate1:MATerial:DIRection FWD :CALCulate1:MATerial:DIRection? Return: FWD

3.24.13 Estimation of Permittivity

Command Format	:CALCulate<cnum>:MATerial:ESTimate:EPSilon<numeric1>, <numeric2> :CALCulate<cnum>:MATerial:ESTimate:EPSilon?
Instruction	When the measurement model is Ref/Tran ε Precision, set or get an

	estimated value of the permittivity.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <numeric1>:represents the real part value of the permittivity, float type. <numeric2>:represents the imaginary part value of the permittivity, float type.
Return	Data array
Default	1,0
Menu	Meas > Meas Setup > Meas Setup > Measurement Model > Ref/Tran ε Precision > Permittivity
Example	:CALCulate1:MATerial:ESTimate:EPSilon 3,4 :CALCulate1:MATerial:ESTimate:EPSilon? Return: 3.000000000000e+00,4.000000000000e+00

3.24.14 Port for Material Measurement

Command Format	:SENSe<cnum>:MATerial:PMAP <pnum1>,<pnum2> :SENSe<cnum>:MATerial:PMAP?
Instruction	This command set or get the forward and reverse ports for material measurement.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <pnum1>:={1|2|3|4},represents 1st Port. <pnum2>:={1|2|3|4},represents 2nd Port. <pnum1> and <pnum2> cannot be the same.
Return	Data array
Default	1,2
Menu	Meas > Meas Setup > Meas Setup > Preset > Select Ports
Example	:SENSe1:MATerial:PMAP 3,2 :SENSe1:MATerial:PMAP?

	Return: 3,2

3.25 Gain Compression Commands(Option, SHN900A series models do not support)

3.25.1 Frequency

3.25.1.1 Command List

Data Acquisition Mode	:SENSe<cnum>:GCSetup:AMODe
Frequency Points	:SENSe<cnum>:GCSetup:SWEep:FREQuency:POINts

3.25.1.2 Data Acquisition Mode

Command Format	:SENSe<cnum>:GCSetup:AMODe <type> :SENSe<cnum>:GCSetup:AMODe?
Instruction	Set and read the method by which gain compression data is acquired.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={SMARtsweep|FPOWer|PFREQuency} SMARtsweep: Smart Sweep FPOWer: Sweep Frequency Per Power PFREQuency: Sweep Power Per Frequency
Return	Enumeration
Default	SMARtsweep
Menu	Sweep > GC Setup... > Frequency > Data Acquisition Mode
Example	:SENS:GCS:AMOD FPOW :SENS:GCS:AMOD? Return: FPOW

3.25.1.3 Frequency Points

Command Format	:SENSe<cnum>:GCSetup:SWEep:FREQuency:POINts <numeric> :SENSe<cnum>:GCSetup:SWEep:FREQuency:POINts?
Instruction	Set and read the number of data points in each frequency sweep.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Frequency points. Do not exceed the max number of data points.
Return	Integer
Default	201
Menu	Sweep > GC Setup... > Frequency > Frequency Setting > Frequency Points
Example	:SENS:GCS:SWE:FREQ:POIN 10 :SENS:GCS:SWE:FREQ:POIN? Return: 10

3.25.2 Power

3.25.2.1 Command List

DUT Port Map	:SENSe<cnum>:GCSetup:PMAP
DUT Input Port Query	:SENSe<cnum>:GCSetup:PMAP:INPut?
DUT Output Port Query	:SENSe<cnum>:GCSetup:PMAP:OUTPut?
Linear Input Power	:SENSe<cnum>:GCSetup:POWer:LINear:INPut:LEVel
Reverse Power	:SENSe<cnum>:GCSetup:POWer:REVerse:LEVel
Power Points	:SENSe<cnum>:GCSetup:SWEep:POWer:POINts
Start Power	:SENSe<cnum>:GCSetup:POWer:STARt:LEVel
Stop Power	:SENSe<cnum>:GCSetup:POWer:STOP:LEVel

3.25.2.2 DUT Port Map

Command Format	:SENSe<cnum>:GCSetup:PMAP <pnum1>,<pnum2>

Instruction	This command sets the VNA to DUT port map for the GC measurements.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1. <pnum1>: SNA port to connect to the DUT input. <pnum2>: SNA port to connect to the DUT output.
Return	None
Default	1,2
Menu	Sweep > GC Setup... > Power > Port Setting > Input Port / Output Port
Example	:SENS:GCS:PMAP 2,1

3.25.2.3 DUT Input Port Query

Command Format	:SENSe<cnum>:GCSetup:PMAP:INPut?
Instruction	This command gets the SNA port that is mapped to the DUT input.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.
Return	Integer. Input port number.
Default	1
Menu	Sweep > GC Setup... > Power > Port Setting > Input Port
Example	:SENS:GCS:PMAP:INP? Return: 1

3.25.2.4 DUT Output Port Query

Command Format	:SENSe<cnum>:GCSetup:PMAP:OUTPut?
Instruction	This command gets the SNA port that is mapped to the DUT output.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum>defaults to 1.

Return	Integer. Output port number.
Default	2
Menu	Sweep > GC Setup... > Power > Port Setting > Output Port
Example	:SENS:GCS:PMAP:OUTP? Return: 2

3.25.2.5 Linear Input Power

Command Format	:SENSe<cnum>:GCSetup:POWer:LINear:INPut:LEVel <numeric> :SENSe<cnum>:GCSetup:POWer:LINear:INPut:LEVel?
Instruction	Set and read the input power at which Linear Gain and all S-parameters are measured.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Input power level in dBm. Choose a value from +20 to (-20).
Return	Float
Default	-20, unit: dBm
Menu	Sweep > GC Setup... > Power > Port Setting > Linear Input Power
Example	:SENS:GCS:POW:LIN:INP:LEV 0 :SENS:GCS:POW:LIN:INP:LEV? Return: 0

3.25.2.6 Reverse Power

Command Format	:SENSe<cnum>:GCSetup:POWer:REVerse:LEVel <numeric> :SENSe<cnum>:GCSetup:POWer:REVerse:LEVel?
Instruction	Set and read the reverse power level to the DUT. This is applied to the DUT output port when making reverse measurements like S22.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Reverse power level in dBm. Choose a value from +20 to (-

	20).
Return	Float
Default	-20, unit: dBm
Menu	Sweep > GC Setup... > Power > Port Setting > Reverse Output Power
Example	:SENS:GCS:POW:REV:LEV 0 :SENS:GCS:POW:REV:LEV? Return: 0

3.25.2.7 Power Points

Command Format	:SENSe<cnum>:GCSetup:SWEep:POWer:POINts <numeric> :SENSe<cnum>:GCSetup:SWEep:POWer:POINts?
Instruction	Set and read the number of data points in each power sweep. Applies ONLY to 2D acquisition modes.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Power points. Do not exceed the max number of data points.
Return	Integer
Default	21
Menu	Sweep > GC Setup... > Power > Power Setting > Power Points
Example	:SENS:GCS:SWE:POW:POIN 10 :SENS:GCS:SWE:POW:POIN? Return: 10

3.25.2.8 Start Power

Command Format	:SENSe<cnum>:GCSetup:POWer:STARt:LEVel <numeric> :SENSe<cnum>:GCSetup:POWer:STARt:LEVel?
Instruction	Set and read the start power level.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Start power level in dBm. Choose a value from +20 to (-

	20).
Return	Float
Default	-10, unit: dBm
Menu	Sweep > GC Setup... > Power > Power Setting > Start(Min) Power
Example	:SENS:GCS:POW:STAR:LEV 0 :SENS:GCS:POW:STAR:LEV? Return: 0

3.25.2.9 Stop Power

Command Format	:SENSe<cnum>:GCSetup:POWer:STOP:LEVel <numeric> :SENSe<cnum>:GCSetup:POWer:STOP:LEVel?
Instruction	Set and read the stop power level.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Stop power level in dBm. Choose a value from +20 to (-20).
Return	Float
Default	0, unit: dBm
Menu	Sweep > GC Setup... > Power > Power Setting > Stop(Max) Power
Example	:SENS:GCS:POW:STOP:LEV 0 :SENS:GCS:POW:STOP:LEV? Return: 0

3.25.3 Comression

3.25.3.1 Command List

Compression Method	:SENSe<cnum>:GCSetup:COMPression:ALGorithm
Back Off Level	:SENSe<cnum>:GCSetup:COMPression:BACKoff:LEVel
Delta X	:SENSe<cnum>:GCSetup:COMPression:DELTa:X
Delta Y	:SENSe<cnum>:GCSetup:COMPression:DELTa:Y
Interpolation State	:SENSe<cnum>:GCSetup:COMPression:INTerpolation

Comression Level	:SENSe<cnum>:GCSetup:COMPression:LEVel
Saturation Compression Level	:SENSe<cnum>:GCSetup:COMPression:SATuration:LEVel
End of Condition	:SENSe<cnum>:GCSetup:EOSoperation
Safe Mode State	:SENSe<cnum>:GCSetup:SAFE:ENABle
Coarse Increment	:SENSe<cnum>:GCSetup:SAFE:CPADjustment
Fine Increment	:SENSe<cnum>:GCSetup:SAFE:FPADjustment
Fine Threshold	:SENSe<cnum>:GCSetup:SAFE:FTHReshold
Max Output Power	:SENSe<cnum>:GCSetup:SAFE:MLimit
Maximum Iterations	:SENSe<cnum>:GCSetup:SMARt:MITerations
Show Iterations State	:SENSe<cnum>:GCSetup:SMARt:SITerations
Settling Time	:SENSe<cnum>:GCSetup:SMARt:STIMe
Tolerance	:SENSe<cnum>:GCSetup:SMARt:TOLerance

3.25.3.2 Compression Method

Command Format	:SENSe<cnum>:GCSetup:COMPression:ALGorithm <type> :SENSe<cnum>:GCSetup:COMPression:ALGorithm?
Instruction	Set and read the algorithm method used to compute gain compression.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={CFLG|CFMG|BACKoff|XYCOM|SAT} CFLG: Compression from Linear Gain CFMG: Compression from Maximum Gain BACKoff: Compression from BackOff XYCOM: X/Y Compression SAT: Compression from Saturation
Return	Enumeration
Default	CFLG
Menu	Sweep > GC Setup... > Compression > Compression Method
Example	:SENS:GCS:COMP:ALG XYCOM :SENS:GCS:COMP:ALG?

	Return: XYCOM

3.25.3.3 Back Off Level

Command Format	:SENSe<cnum>:GCSetup:COMPression:BACKoff:LEVel <numeric> :SENSe<cnum>:GCSetup:COMPression:BACKoff:LEVel?
Instruction	Set and read value for the BackOff compression algorithm.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Backoff value in dB. Choose from 0.01 to 20
Return	Float
Default	10, unit: dB
Menu	Sweep > GC Setup... > Compression > Compression Method > Back Off
Example	:SENS:GCS:COMP:BACK:LEVEL 10 :SENS:GCS:COMP:BACK:LEVEL? Return: 10

3.25.3.4 Delta X

Command Format	:SENSe<cnum>:GCSetup:COMPression:DELTa:X <numeric> :SENSe<cnum>:GCSetup:COMPression:DELTa:X?
Instruction	Set and read the 'X" value in the delta X/Y compression algorithm.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: X value in dB. Choose from 0.01 to 20
Return	Float
Default	10, unit: dB
Menu	Sweep > GC Setup... > Compression > Compression Method > Delta X
Example	:SENS:GCS:COMP:DELT:X 10 :SENS:GCS:COMP:DELT:X? Return: 10

3.25.3.5 Delta Y

Command Format	:SENSe<cnum>:GCSetup:COMPression:DELTa:Y <numeric> :SENSe<cnum>:GCSetup:COMPression:DELTa:Y?
Instruction	Set and read the 'Y" value in the delta X/Y compression algorithm.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Y value in dB. Choose from 0.01 to 20
Return	Float
Default	9, unit: dB
Menu	Sweep > GC Setup... > Compression > Compression Method > Delta Y
Example	:SENS:GCS:COMP:DELT:Y 9 :SENS:GCS:COMP:DELT:Y? Return: 9

3.25.3.6 Interpolation State

Command Format	:SENSe<cnum>:GCSetup:COMPression:INTerpolation <bool> :SENSe<cnum>:GCSetup:COMPression:INTerpolation?
Instruction	Sets whether or not interpolation should be performed on 2D measured compression data. Applies ONLY to 2D acquisition modes.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > GC Setup... > Compression > 2D Sweep > Compression Point Interpolation
Example	:SENS:GCS:COMP:INT 1 :SENS:GCS:COMP:INT? Return: 1

3.25.3.7 Comression Level

Command Format	:SENSe<cnum>:GCSetup:COMPression:LEVel <numeric> :SENSe<cnum>:GCSetup:COMPression:LEVel?
Instruction	Set and read the desired gain reduction (from reference gain).This value is used for Compression from Linear Gain and Compression from Maximum Gain.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Compression level in dB. Choose a value greater than 0.1 dB.
Return	Float
Default	1, unit: dB
Menu	Sweep > GC Setup... > Compression > Compression Method > Level
Example	:SENS:GCS:COMP:LEV 1 :SENS:GCS:COMP:LEV? Return: 1

3.25.3.8 Saturation Compression Level

Command Format	:SENSe<cnum>:GCSetup:COMPression:SATuration:LEVel <numeric> :SENSe<cnum>:GCSetup:COMPression:SATuration:LEVel?
Instruction	Set and read the deviation dB from the maximum Pout. This is the point of saturation.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Saturation level in dB. Choose a value greater than 0.01 dB.
Return	Float
Default	1, unit: dB
Menu	Sweep > GC Setup... > Compression > Compression Method > Level
Example	:SENS:GCS:COMP:SAT:LEV 1 :SENS:GCS:COMP:SAT:LEV?

	Return: 1

3.25.3.9 End of Condition

Command Format	:SENSe<cnum>:GCSetup:EOSoperation <type> :SENSe<cnum>:GCSetup:EOSoperation?
Instruction	Set and read the This setting is used to protect a sensitive device from too much power during the sweep retrace. Other instrument settings or channels may over-ride this setting.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <type>:={DEFault|STANdard|POFF| PSTArt |PSTOp} DEFault: Use the default VNA method STANdard: Use the default VNA method POFF: Always turn power OFF while waiting PSTArt: Sweep Start power PSTOp: Sweep Stop power
Return	Enumeration
Default	DEFault
Menu	Sweep > GC Setup... > Compression > End of Sweep Condition
Example	:SENS:GCS:EOS POFF :SENS:GCS:EOS? Return: POFF

3.25.3.10 Safe Mode State

Command Format	:SENSe<cnum>:GCSetup:SAFE:ENABle <bool> :SENSe<cnum>:GCSetup:SAFE:ENABle?
Instruction	Set and read the (ON | OFF) state of Safe Sweep mode.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean

Default	OFF
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Safe Mode... > Safe Mode
Example	:SENS:GCS:SAFE:ENAB 1 :SENS:GCS:SAFE:ENAB? Return: 1

3.25.3.11 Coarse Increment

Command Format	:SENSe<cnum>:GCSetup:SAFE:CPADjustment <numeric> :SENSe<cnum>:GCSetup:SAFE:CPADjustment?
Instruction	Set and read the Safe Sweep COARSE power adjustment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Coarse power adjustment setting in dB. Choose a value from +20 to (-20).
Return	Float
Default	3, unit: dB
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Safe Mode... > Coarse Increment
Example	:SENS:GCS:SAFE:CPAD 1 :SENS:GCS:SAFE:CPAD? Return: 1

3.25.3.12 Fine Increment

Command Format	:SENSe<cnum>:GCSetup:SAFE:FPADjustment <numeric> :SENSe<cnum>:GCSetup:SAFE:FPADjustment?
Instruction	Set and read the Safe Sweep FINE power adjustment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Fine power adjustment setting in dB. Choose a value from +20 to (-20).

Return	Float
Default	1, unit: dB
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Safe Mode... > Fine Increment
Example	:SENS:GCS:SAFE:FPAD 0.5 :SENS:GCS:SAFE:FPAD? Return: 0.5

3.25.3.13 Fine Threshold

Command Format	:SENSe<cnum>:GCSetup:SAFE:FTHReshold <numeric> :SENSe<cnum>:GCSetup:SAFE:FTHReshold?
Instruction	Set and read the compression level in which Safe Sweep changes from the COARSE power adjustment to the FINE power adjustment.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Threshold setting in dB. Choose a value from +20 to (-20).
Return	Float
Default	0.5, unit: dB
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Safe Mode... > Fine Threshold
Example	:SENS:GCS:SAFE:FTHR 1 :SENS:GCS:SAFE:FTHR? Return: 1

3.25.3.14 Max Output Power

Command Format	:SENSe<cnum>:GCSetup:SAFE:MLimit <numeric> :SENSe<cnum>:GCSetup:SAFE:MLimit?
Instruction	When the VNA port that is connected to the DUT Output measures this value, the input power to the DUT is no longer incremented at that frequency.

Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Maximum power limit in dBm.
Return	Float
Default	30, unit: dBm
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Safe Mode… > Max Output Power
Example	:SENS:GCS:SAFE:ML 20 :SENS:GCS:SAFE:ML? Return: 20

3.25.3.15 Maximum Iterations

Command Format	:SENSe<cnum>:GCSetup:SMARt:MITerations <numeric> :SENSe<cnum>:GCSetup:SMARt:MITerations?
Instruction	Set and read the maximum permitted number of iterations which SMART Sweep may utilize to find the desired compression level, to within the specified tolerance.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Maximum number of iterations. Choose a value between 1 and 500
Return	Integer
Default	20
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Maximum Iterations
Example	:SENS:GCS:SMAR:MIT 10 :SENS:GCS:SMAR:MIT? Return: 10

3.25.3.16 Show Iterations State

Command Format	:SENSe<cnum>:GCSetup:SMARt:SITerations <bool>

	:SENSe<cnum>:GCSetup:SMARt:SITerations?
Instruction	Set and read enable for showing intermediate results for each iteration of SMART Sweep.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0
Return	Boolean
Default	OFF
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Show Iterations
Example	:SENS:GCS:SMAR:SIT 1 :SENS:GCS:SMAR:SIT? Return: 1

3.25.3.17 Settling Time

Command Format	:SENSe<cnum>:GCSetup:SMARt:STIMe <numeric> :SENSe<cnum>:GCSetup:SMARt:STIMe?
Instruction	Set and read the amount of time SMART Sweep will dwell at the first point where the input power changes by the Backoff or X level. Applies only to SMART Sweep when Backoff or XY compression methods are selected.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Settling time in seconds. Choose any positive value.
Return	Float
Default	0, unit: seconds
Menu	Sweep > GC Setup... > Compression > Settling Time
Example	:SENS:GCS:SMAR:STIM 1 :SENS:GCS:SMAR:STIM? Return: 1

3.25.3.18 Tolerance

Command Format	:SENSe<cnum>:GCSetup:SMARt:TOLerance <numeric> :SENSe<cnum>:GCSetup:SMARt:TOLerance?
Instruction	Set and read the acceptable range SMART Sweep will allow for the measured compression level.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric>: Tolerance level in dBm. Choose a value between 0.01 and 10
Return	Float
Default	0.05, unit: dB
Menu	Sweep > GC Setup... > Compression > Smart Sweep > Tolerance
Example	:SENS:GCS:SMAR:TOL 0.1 :SENS:GCS:SMAR:TOL? Return: 0.1

3.26 Noise Figure Commands(Option, SHN900A series models do not support)

3.26.1 Noise Figure

3.26.1.1 Command List

Noise Figure Method	:SENSe<cnum>:NOISe:METhod
Noise Average Number	:SENSe<cnum>:NOISe:AVERage
Noise Average Switch	:SENSe<cnum>:NOISe:AVERage:STATe
Noise Bandwidth	:SENSe<cnum>:NOISe:BWIDth[:RESolution]
Noise Ambient Temperature	:SENSe<cnum>:SWEep:TEMPerature:AMBient

3.26.1.2 Noise Figure Method

Command Format	:SENSe<cnum>:NOISe:METhod <char> :SENSe<cnum>:NOISe:METhod?

Instruction	Set or obtain the noise figure measurement method.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <char>:={ CSCALAR|CVECTOR|YFACTOR } CSCALAR: Scalar Cold Source CVECTOR: Vector Cold Source YFACTOR: Y Factor
Return	Enum
Default	CSCALAR
Menu	Sweep >Noise Figure... > Noise Figure > Noise Figure Method
Example	:SENS:NOIS:MET CVECTOR :SENS:NOIS:MET? Return: CVECTOR

3.26.1.3 Noise Average Number

Command Format	:SENSe<cnum>:NOISe:AVERage[:COUNt] <numeric> :SENSe<cnum>:NOISe:AVERage[:COUNt]?
Instruction	Set or obtain the noise figure average number.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric> integer, Indicate the average number.
Return	Integer
Default	20
Menu	Sweep >Noise Figure... > Noise Figure > Average
Example	:SENS:NOIS:AVER 30 :SENS:NOIS:AVER?

	Return: 30

3.26.1.4 Noise Average Switch

Command Format	:SENSe<cnum>:NOISe:AVERage:STATe <bool> :SENSe<cnum>:NOISe:AVERage:STATe?
Instruction	Turn on or off noise average.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <bool>:= ON|OFF|1|0.
Return	Boolean (1=ON,0=OFF)
Default	ON
Menu	Sweep >Noise Figure... > Noise Figure > Average
Example	:SENS:NOIS:AVER:STAT ON :SENS:NOIS:AVER:STAT? Return: 1

3.26.1.5 Noise Bandwidth

Command Format	:SENSe<cnum>:NOISe:BWIDth[:RESolution] <numeric> :SENSe<cnum>:NOISe:BWIDth[:RESolution]?
Instruction	Set or obtain the noise bandwidth.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric> integer, Unit Hz, Indicate the noise bandwidth.

Return	Integer
Default	1MHz
Menu	Sweep >Noise Figure... > Noise Figure > Bandwidth
Example	:SENSe:NOIS:BWID 1e6 :SENSe:NOIS:BWID? Return: 1000000

3.26.1.6 Noise Ambient Temperature

Command Format	:SENSe<cnum>:SWEep:TEMPerature:AMBient <numeric> :SENSe<cnum>:SWEep:TEMPerature:AMBient?
Instruction	Set or obtain the noise measurement ambient temperature.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric> integer, Indicate the ambient temperature.
Return	Integer, Unit K.
Default	290
Menu	Sweep >Noise Figure... > Noise Figure > Ambient Temperature
Example	:SENS:NOIS:TEMP:AMB 300 :SENS:NOIS:TEMP:AMB? Return: 300

3.26.2 Power

3.26.2.1 Command List

Receiver Correction Power	:SENSe<cnum>:NOISe:RECeiver:CORRection:POWer:LEVel

3.26.2.2 Receiver Correction Power

Command Format	:SENSe<cnum>:NOISe:RECeiver:CORRection:POWer:LEVel <numeric> :SENSe<cnum>:NOISe:RECeiver:CORRection:POWer:LEVel?
Instruction	Set or obtain the receiver correction power level.
Parameter Type	<cnum>:={[1] -256}, represents the measurement channel number. If not specified, <cnum> defaults to 1. <numeric> Indicate the power level, the range is -55~20.
Return	Float, Unit dBm.
Default	-40
Menu	Sweep >Noise Figure... > Power > Receiver Cali
Example	:SENS:NOIS:REC:CORR:POW:LEV -40 :SENS:NOIS:REC:CORR:POW:LEV? Return: -40

4 SCPI Programming Examples

This chapter gives some examples for the programmer. In these examples you can see how to use the VISA or sockets, in combination with the commands have been described above to control the SNA. By following these examples, you can develop many more applications.

4.1 Select Measurement Mode using SCPI

```
"""
This example program shows how to use SCPI command to Switch Measurement Mode.
The following program does the following:
    1,Preset SNA
    2,Switch Measurement Mode
To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa
# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.13.234::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)
# Preset the SNA
SNA.write(':SYSTem:PRESet')
# Select Measurement Mode to SMM, measurement mode include:VNA/SA/SMM
SNA.write(':CALCulate1:INSTrument SMM')
```

4.2 Channels Windows and Measurements using SCPI

```
"""
This example program explains how to use SCPI command to create windows, channels and
measurements.

The following program does the following:

    1,Presets SNA
    2,Create a new window and a new channel
    3,Create Measurements for each channel
    4,Change frequency ranges for each channel
```

```
    5,Select active trace
    6,Turn marker 1 ON for each measurement

To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa

# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.13.234::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA
SNA.write(':SYSTem:PRESet')

# Create a new window and a new channel
SNA.write(':DISPlay:ADD:FUNCtion:EXECute WIN_CH_TRC')

# Create Measurements for each channel,Parameters that can be set include:S-
Params/Balanced/Receiver/Wave/Ratio
SNA.write(':CALCulate1:PARameter1:DEFine S12')
SNA.write(':CALCulate2:PARameter2:DEFine S12')

# Set channel 1 start frequency to 1GHz and stop frequency to 3 GHz
SNA.write(':SENSe1:FREQuency:STARt 1e9')
SNA.write(':SENSe1:FREQuency:STOP 3e9')

# Set channel 2 start frequency to 2GHz and stop frequency to 4 GHz
SNA.write(':SENSe2:FREQuency:STARt 2e9')
SNA.write(':SENSe2:FREQuency:STOP 4e9')

# Select active trace
SNA.write(':CALCulate1:PARameter1:SELect')

# Turn marker 1 ON for each measurement
SNA.write(':CALCulate1:TRACe1:MARKer1:ACTivate')
SNA.write(':CALCulate2:TRACe2:MARKer1:ACTivate')
```

4.3 Setup Sweep Parameters using SCPI

```
"""
This Python program sets up sweep parameters on the Channel 1 measurement.
```

```
To run this program, you need :
    An established USB interface or LAN connection
"""

import pyvisa

#Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.13.219::INSTR'

#Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)
#preset the SNA
SNA.write(':SYSTem:PRESet')

#Select the measurement
SNA.write('CALCulate1:PARameter1:DEFine S21')

#Set formate type to smith
SNA.write(':CALCulate1:TRACe1:FORMat SMITh')

#Set start frequency to 1GHz and stop frequency to 5 GHz
SNA.write(':SENSe1:FREQuency:STARt 1e9')
SNA.write(':SENSe1:FREQuency:STOP 5e9')

#Set IF Bandwidth to 1500
SNA.write(':SENSe1:BANDwidth 15e3')

#Set number of points to 251
SNA.write(':SENSe1:SWEep:POINts 251')

#Set the channel triggers indefinitely
SNA.write(':SENSe:SWEep:MODE CONTinuous')
```

4.4 Waiting for Trigger(OPC?)

```
"""

The example program demonstrates how to use the :TRIG:SING command to start a sweep

(measurement) cycle, then

uses the *OPC command to wait until the measurement cycle is completed, then prints a message
```

The following program does the following:

1.Presets SNA

2,Turn on continuous initiation mode for the channel

3,Set the trigger source to Bus Trigger

4,Trigger the instrument to start a sweep cycle

5,Execute the *OPC? command

To run this program, you need :

An established USB interface or LAN connection

"""

```
import pyvisa

# Change this variable to the address of your instrument

VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'

# Create a connection (dev) to the instrument

resourceManager = pyvisa.ResourceManager()

SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA

SNA.write(':SYSTem:PRESet')

# Turn on continuous initiation mode for the channel

SNA.write(':INITiate 1:CONTinuous 1')

# Set the trigger source to Bus Trigger

SNA.write(':TRIGger:SEQuence:SOURce BUS')

# Trigger the instrument to start a sweep cycle
```

```
SNA.write(':TRIGger:SEQuence:SINGle')

# Execute the *OPC? command and wait until the command returns 1 (the measurement cycle is

completed).

flag = SNA.query('*OPC?')

if flag.replace("\n", "") == '1':

    print(f'the measurement is completed')
```

4.5 Getting and Putting Data with Ascii Format

```
"""
This example program shows how to store data in ASCII format and put it back.

The following program does the following:

    1,Preset the SNA
    2,Create a Measurements
    3,Set the channel trigger mode to single
    4,Execute the *OPC? command
    5,Set data format to ASCII
    6,Read trace data
    7,Preset the SNA again
    8,Set data format to ASCII
    9,Write data in ASCII format

To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa

# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA
SNA.write(':SYSTem:PRESet')
```

```
# Create a Measurements
SNA.write(':CALCulate1:PARameter1:DEFine S21')

# Set the trigger source to Bus Trigger
SNA.write(':TRIGger:SEQuence:SOURce BUS')

# Trigger the instrument to start a sweep cycle
SNA.write(':TRIGger:SEQuence:SINGle')

# Execute the *OPC? command and wait until the command returns 1 (the measurement cycle is
completed).
while True:
    if int(SNA.query('*OPC?'))==1:
        break

# Set data format to ASCII
SNA.write(':FORMat:DATA ASC')

# Read trace data
fdata = SNA.query_ascii_values(':CALCulate1:DATA:FDATa?')

# Preset the SNA again
SNA.write(':SYSTem:PRESet')

# Set data format to ASCII
SNA.write(':FORMat:DATA ASC')

# Write data in ASCII format
SNA.write_ascii_values(':CALCulate1:DATA:FDATa ', fdata)
```

4.6 Getting and Putting Data with Binary(IEE32) Format

```
"""
```

This example program shows how to store data in binary(IEEE 32) format and put it back.

The following program does the following:

1,Preset the SNA
2,Create a Measurements
3,Set the channel trigger mode to single
4,Execute the *OPC? command
5,Set data format to IEEE 32-bit floating-point binary
6,Read trace data
7,Preset the SNA again

```
    8,Set data format to IEEE 32-bit floating-point binary
    9,Write data in IEEE 32-bit floating-point binary format


To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa
# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA
SNA.write(':SYSTem:PRESet')

# Create a Measurements
SNA.write(':CALCulate1:PARameter1:DEFine S21')

# Set the trigger source to Bus Trigger
SNA.write(':TRIGger:SEQuence:SOURce BUS')

# Trigger the instrument to start a sweep cycle
SNA.write(':TRIGger:SEQuence:SINGle')

# Execute the *OPC? command and wait until the command returns 1 (the measurement cycle is
completed).
while True:
    if int(SNA.query('*OPC?'))==1:
        break

# Set data format to IEEE 32-bit floating-point binary
SNA.write(':FORMat:DATA REAL32')

# Read trace data
fdata = SNA.query_binary_values(':CALCulate1:DATA:FDATa?', datatype='f')

# Preset the SNA again
SNA.write(':SYSTem:PRESet')

# Set data format to IEEE 32-bit floating-point binary
SNA.write(':FORMat:DATA REAL32')

# Write data in IEEE 32-bit floating-point binary format
SNA.write_binary_values(':CALCulate1:DATA:FDATa ', fdata, datatype='f')
```

4.7 Getting and Putting Data with Binary(IEE64) Format

```
"""
This example program shows how to store data in binary(IEEE 64) format and put it back.

The following program does the following:

   1,Preset the SNA
   2,Create a Measurements
   3,Set the channel trigger mode to single
   4,Execute the *OPC? command
   5,Set data format to IEEE 64-bit floating-point binary
   6,Read trace data
   7,Preset the SNA again
   8,Set data format to IEEE 64-bit floating-point binary
   9,Write data in IEEE 64-bit floating-point binary format
To run this program, you need :
   An established USB interface or LAN connection
"""
import pyvisa

# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA
SNA.write(':SYSTem:PRESet')

# Create a Measurements
SNA.write(':CALCulate1:PARameter1:DEFine S21')

# Set the trigger source to Bus Trigger
SNA.write(':TRIGger:SEQuence:SOURce BUS')

# Trigger the instrument to start a sweep cycle
SNA.write(':TRIGger:SEQuence:SINGle')

# Execute the *OPC? command and wait until the command returns 1 (the measurement cycle is
completed).
while True:
   if int(SNA.query('*OPC?'))==1:
```

```
        break

# Set data format to IEEE 64-bit floating-point binary
SNA.write(':FORMat:DATA REAL')

# Read trace data
fdata = SNA.query_binary_values(':CALCulate1:DATA:FDATa?', datatype='d')

# Preset the SNA again
SNA.write(':SYSTem:PRESet')

# Set data format to IEEE 64-bit floating-point binary
SNA.write(':FORMat:DATA REAL')

# Write data in IEEE 64-bit floating-point binary format
SNA.write_binary_values(':CALCulate1:DATA:FDATa ', fdata, datatype='d')
```

4.8 Perform Bandwidth Search using SCPI

```
"""
This example program shows how to use SCPI command to do a bandwidth search.

The following program does the following:

    1,Preset SNA
    2,Create a Measurements to S21
    3,Change channel frequency ranges
    4,Set number of points
    5,Auto scales the Trace
    6,Create a marker
    7,Set BW Ref to Peak
    8,Set BW Level
    9,Enable Bandwidth Search
    10,Read bandwidth search results and print them out

To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa
# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)
```

```
# preset the SNA
SNA.write(':SYSTem:PRESet')

#Create a Measurements to S21
SNA.write(':CALCulate1:PARameter1:DEFine S21')

# Set channel start frequency to 1GHz and stop frequency to 6GHz
SNA.write(':SENSe1:FREQuency:STARt 1e9')
SNA.write(':SENSe1:FREQuency:STOP 6e9')

# Set number of points 11
SNA.write(':SENSe1:SWEep:POINts 11')

# Auto scales the Trace
SNA.write(':DISPlay:WINDow1:TRACe1:Y:AUTO')

# Create a marker
SNA.write(':CALCulate1:TRACe1:MARKer1:ACTivate')

# Set BW Ref to Peak
SNA.write(':CALCulate1:SELected:MARKer1:BWIDth:REF MARKer')

# Set BW Level -3.5
SNA.write(':CALCulate1:TRACe1:MARKer1:BWIDth:THReshold -3.5')

# Enable BandWidth Search
SNA.write(':CALCulate1:MARKer:BWIDth ON')

# Read bandwidth search results and print them out
bandwidth = SNA.query(':CALCulate1:MARKer1:BWIDth:DATA?')
bandwidth_value = list(map(float, bandwidth.split(',')))
print(f'Bandwidth search results : BW:{bandwidth_value[0]},Center
freq:{bandwidth_value[1]},Q:{bandwidth_value[2]},Loss:{bandwidth_value[3]}')
```

4.9 Perform Maximum Peak Search using Marker

```
"""
This example program shows how to use Marker command to perform maximum peak search.

The following program does the following:

    1,Preset SNA
    2,Change channel frequency ranges
```

```
    3,Create a marker
    4,Perform maximum search
    5,Read the X-axis and Y-axis values of the maximum value cursor

To run this program, you need :
    An established USB interface or LAN connection
"""
import pyvisa
# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'
# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)

# preset the SNA
SNA.write(':SYSTem:PRESet')

# Set channel start frequency to 100MHz and stop frequency to 200MHz
SNA.write(':SENSe1:FREQuency:STARt 1e6')
SNA.write(':SENSe1:FREQuency:STOP 2e6')

# Create a marker
SNA.write(':CALCulate1:TRACe1:MARKer1:ACTivate')

# Perform maximum search,before sending the execution command, you need to set the search mode to maximum search
SNA.write(':CALCulate1:TRACe1:MARKer1:FUNCtion:TYPE MAXimum')
SNA.write(':CALCulate1:TRACe1:MARKer1:FUNCtion:EXECute')

# Read the X-axis and Y-axis values of the maximum value cursor
x_value = SNA.query(':CALCulate1:MARKer1:X?')
y_value = SNA.query(':CALCulate1:TRACe1:MARKer1:Y?')
```

4.10 Save and Recall files

```
"""
```

This example program shows how to use SCPI command to save and recall files.

The following program does the following:

1,Preset the SNA

2,Create a Measurements

3,Change channel frequency ranges

4,Set number of points

5,Save file

6,Preset the SNA again

7,Recall the file

To run this program, you need :

An established USB interface or LAN connection

"""

```
import pyvisa

# Change this variable to the address of your instrument

VISA_ADDRESS = 'TCPIP0::10.11.22.64::INSTR'

# Create a connection (dev) to the instrument

resourceManager = pyvisa.ResourceManager()

SNA = resourceManager.open_resource(VISA_ADDRESS)


# preset the SNA

SNA.write(':SYSTem:PRESet')


# Create a Measurements to S21

SNA.write(':CALCulate1:PARameter1:DEFine S21')
```

```
# Set channel start frequency to 1GHz and stop frequency to 6GHz

SNA.write(':SENSe1:FREQuency:STARt 1e9')

SNA.write(':SENSe1:FREQuency:STOP 6e9')


# Set number of points 100

SNA.write(':SENSe1:SWEep:POINts 100')


# Save file,file type include:CSA files,STA files,CSV files,CAl files and SnP files,example using CSA files

SNA.write(':MMEMory:STORE "local/test.csa"')


# preset the SNA again

SNA.write(':SYSTem:PRESet')


# Recall saved CSV file

SNA.write(':MMEMory:LOAD "local/test.csa"')
```

4.11 Transfer File using SCPI

"""

The following Python examples transfer files to and from a remote PC using the MMEM:TRANsfer command.

The following program does the following:

```
    1,Open file to be stored on local computer. Creates file if not already existing

    2,Query SNA default saved files

    3,Transferring SNA file data to computer files

    4,Read PC file data

    5,Transferring computer file data to SNA files


To run this program, you need :

    An established USB interface or LAN connection

"""


import pyvisa


# Change this variable to the address of your instrument

VISA_ADDRESS = 'TCPIP0::10.11.22.53::INSTR'


# Create a connection (dev) to the instrument

resourceManager = pyvisa.ResourceManager()

SNA = resourceManager.open_resource(VISA_ADDRESS)


# ==================Transferring from the SNA to the remote PC====================

# Open file to be stored on local computer. Creates file if not already existing

pc_file = open("D:\sna_to_pc.csv", 'wb')
```

```
# Analyzer has file 'sna.csv' in default directory.

# The default directory is where the VNA saves files to on default

data_binary = SNA.query_binary_values(f'MMEMory:TRANsfer? "/local/sna.csv"', datatype='B',

container=bytearray, is_big_endian=False)


# Now save the file locally to pc.csv

pc_file.write(data_binary)

pc_file.close()


# ==================Transferring from the remote PC to the SNA ======================


# PC Local file to be transferred

pc_file = open("D:\pc.csv", 'rb')


# Store file content into variable

# Data to be transferred to analyzer file 'pc_to_sna.csv' in default directory.

data_binary = pc_file.read()

SNA.write_binary_values(f':MMEMory:TRANsfer "/local/pc_to_sna.csv",', data_binary, datatype='B',

is_big_endian=False)

pc_file.close()
```

4.12 Query the storage data of FIFO

```
"""
```

This example program is used to query the storage data of FIFO.

The following program does the following:

1,Preset SNA

2,Set Trigger Source to manual/bus/External,using Bus Trigger as an example

3,Enable FIFO function

4,Set Trigger mode to Single

5,Query the storage data of FIFO

6,Disable FIFO function

To run this program, you need:

An established USB interface or LAN connection

"""

```
import pyvisa

# Change this variable to the address of your instrument
VISA_ADDRESS = 'TCPIP0::10.11.22.218::INSTR'

# Create a connection (dev) to the instrument
resourceManager = pyvisa.ResourceManager()
SNA = resourceManager.open_resource(VISA_ADDRESS)
```

```
# preset the SNA

SNA.write(':SYSTem:PRESet')


# Set Trigger Source to manual/bus/External,using Bus Trigger as an example

SNA.write('TRIGger:SEQuence:SOURce BUS')


# Enable FIFO function

# Execute the *OPC? command and wait until the command returns 1.

SNA.write(':SYSTem:FIFO ON')

SNA.query('*OPC?')


# Trigger the instrument to start a sweep cycle

# Execute the *OPC? command and wait until the command returns 1.

SNA.write(':TRIGger:SEQuence:SINGle')

SNA.query('*OPC?')


# Query the storage data of FIFO.

fifo_data = SNA.query(':SYSTem:FIFO:DATA? 201')

print(fifo_data)


# Disable FIFO function

# Execute the *OPC? command and wait until the command returns 1.

SNA.write(':SYSTem:FIFO OFF')
```

```
SNA.query('*OPC?')
```

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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