3.15 :MASK Commands

:MASK commands are used to set or query the pass/fail test related parameters.

During the product design and manufacturing process, you usually need to monitor the variations of the signal or judge whether the product is up to standard. The standard pass/fail test function of this series oscilloscope can accomplish this task perfectly. You can use this function to set the test rules based on standard waveforms and define the mask. It compares the signal under test with the mask and displays the test results.

3.15.1 :MASK:ENABle

Syntax

:MASK:ENABle <*bool*>

:MASK:ENABle?

Description

Enables or disables the pass/fail test function; or queries the on/off status of the pass/fail test function.

Parameter

Name	Type	Range	Default
<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF

Remarks

The pass/fail test is disabled in the following conditions:

- When the horizontal time base is in ROLL mode; (to set or query the horizontal time base mode, run *:TIMebase:MODE*.)
- When the delayed sweep mode (Zoom) is enabled; (to set or query the on/off status of the delayed sweep, run *:TIMebase:DELay:ENABle*.)
- When performing the waveform recording and playing.

Return Format

The query returns 1 or 0.

Example

```
:MASK:ENABle ON     /*Enables the pass/fail test function.*/
:MASK:ENABle?       /*The query returns 1.*/
```

3.15.2 :MASK:SOURce

Syntax

:MASK:SOURce <*source*>

:MASK:SOURce?

Description

Sets or queries the source of the pass/fail test.

Parameter

Name	Type	Range	Default
<source>	Discrete	{CHANnel1|CHANnel2|CHANnel3|CHANnel4}	CHANnel1

Remarks

When you use the command to set the disabled channel, the disabled channel will be enabled automatically.

Return Format

The query returns CHAN1, CHAN2, CHAN3, or CHAN4.

Example

```
:MASK:SOURce CHANnel2    /*Sets the source of the pass/fail test to
CHANnel2.*/
:MASK:SOURce?             /*The query returns CHAN2.*/
```

3.15.3 :MASK:OPERate

Syntax

:MASK:OPERate <*oper*>

:MASK:OPERate?

Description

Starts or stops the pass/fail test; or queries the operating status of the pass/fail test.

Parameter

Name	Type	Range	Default
<oper>	Discrete	{RUN|STOP}	STOP

Remarks

Before running this command, send the *:MASK:ENABle* command to enable the pass/fail test function.

Return Format

The query returns RUN or STOP.

Example

```
:MASK:OPERate RUN    /*Starts the pass/fail test.*/
:MASK:OPERate?        /*The query returns RUN.*/
```

3.15.4 :MASK:X

Syntax

:MASK:X <*x*>

:MASK:X?

Description

Sets or queries the horizontal adjustment parameter of the pass/fail test mask. The default unit is div.

Parameter

Name	Type	Range	Default
<x>	Real	0.01 div to 2 div	0.24 div

Remarks

N/A

Return Format

The query returns the current horizontal adjustment parameter in scientific notation.

Example

```
:MASK:X 0.28   /*Sets the horizontal adjustment parameter to 0.28
div.*/
:MASK:X?       /*The query returns 2.800000E-1.*/
```

3.15.5 :MASK:Y

Syntax

:MASK:Y <*y*>

:MASK:Y?

Description

Sets or queries the vertical adjustment parameter of the pass/fail test mask. The default unit is div.

Parameter

Name	Type	Range	Default
<y>	Real	0.04 div to 2 div	0.48 div

Remarks

N/A

Return Format

The query returns the current vertical adjustment parameter in scientific notation.

Example

```
:MASK:Y 0.36    /*Sets the vertical adjustment parameter to 0.36
div.*/
:MASK:Y?        /*The query returns 3.600000E-1.*/
```

3.15.6 :MASK:CREate

Syntax

`:MASK:CREate`

Description

Creates the pass/fail test mask with the currently set horizontal and vertical adjustment parameters.

Parameter

N/A

Remarks

- This command is only valid when the pass/fail test function is enabled and not in the running state. You can use *:MASK:ENABle* to query or set the status of the pass/fail test function. You can use *:MASK:OPERate* to query or set the running status.
- You can use *:MASK:X* and *:MASK:Y* to query or set the horizontal and vertical adjustment parameters.

Return Format

N/A

Example

```
N/A
```

3.15.7 :MASK:RESet

Syntax

```
:MASK:RESet
```

Description

Resets the number of frames that passed and failed the pass/fail test, as well as the total number of frames.

Parameter

N/A

Remarks

N/A

Return Format

N/A

Example

```
N/A
```

3.15.8 :MASK:FAILed?

Syntax

```
:MASK:FAILed?
```

Description

Queries the total number of failed frames in the pass/fail test results.

Parameter

N/A

Remarks

N/A

Return Format

The query returns an integer.

Example

```
N/A
```

3.15.9 :MASK:PASSed?

Syntax

:MASK:PASSed?

Description

Queries the total number of passed frames in the pass/fail test results.

Parameter

N/A

Remarks

N/A

Return Format

The query returns an integer.

Example

```
N/A
```

3.15.10 :MASK:TOTal?

Syntax

:MASK:TOTal?

Description

Queries the total number of frames in the pass/fail test results.

Parameter

N/A

Remarks

N/A

Return Format

The query returns an integer.

Example

```
N/A
```

3.15.11 :MASK:OUTPut:ENABle

Syntax

:MASK:OUTPut:ENABle <*bool*>

:MASK:OUTPut:ENABle?

Description

Sets or queries the output on/off status of the rear-panel AUX OUT connector.

Parameter

Name	Type	Range	Default
<bool>	Bool	{{1|ON}|{0|OFF}}	0|OFF

Remarks

- If enabled, in the Utility menu, "AUX Out" is automatically set to "PassFail". When a successful or failed event is detected, a pulse will be output from the **[AUX OUT]** connector.
- If disabled, in the Utility menu, "AUX Out" is automatically set to "TrigOut". The output of the **[AUX OUT]** connector is irrelevant with the pass/fail test.

Return Format

The query returns 0 or 1.

Example

```
:MASK:OUTPut:ENABle ON     /*Enables the Aux output.*/
:MASK:OUTPut:ENABle?       /*The query returns 1.*/
```

3.15.12 :MASK:OUTPut:EVENt

Syntax

:MASK:OUTPut:EVENt <*item*>

:MASK:OUTPut:EVENt?

Description

Sets or queries the output event.

Parameter

Name	Type	Range	Default
<item>	Discrete	{FAIL|PASS}	FAIL

Remarks

N/A

Return Format

The query returns FAIL or PASS.

Example

```
:MASK:OUTPut:EVENt PASS /*Sets the output event to PASS.*/
:MASK:OUTPut:EVENt? /*The query returns PASS.*/
```

3.15.13 :MASK:OUTPut:TIME

Syntax

:MASK:OUTPut:TIME <*time*>

:MASK:OUTPut:TIME?

Description

Sets or queries the output pulse time.

Parameter

Name	Type	Range	Default
<time>	Real	100 ns to 10 ms	1 μs

Remarks

N/A

Return Format

The query returns the pulse time in scientific notation.

Example

```
:MASK:OUTPut:TIME 0.000003 /*Sets the pulse time to 3 μs.*/
:MASK:OUTPut:TIME? /*The query returns 3.000000E-6.*/
```

3.16 :MATH<n> Commands

:MATH<n> commands are used to set various math operation function of the waveform between channels.

This series oscilloscopes can realize multiple math operations between waveforms of different channels, including arithmetic operation, function operation, FFT operation, logic operation, and digital filter.

Operator

Arithmetic Operation

The arithmetic operations supported by this oscilloscope include A+B, A-B, A×B, and A÷B.