

# DS 6000 Specifications

All the specifications are guaranteed except the parameters marked with "Typical" and the oscilloscope needs to operate for more than 30 minutes under the specified operation temperature.

## Sample

Sample Mode	Real-time Sample, Equivalent Sample
Real Time Sample Rate	5 GSa/s (single-channel) 2.5 Gsa/s (dual-channel)
Equivalent Sample Rate	100 Gsa/s
Peak Detect	200 ps (single-channel) 400 ps (dual-channel)
Averaging	After all the channels finish N samples at the same time, N can be 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096 or 8192.
High Resolution	12 bits of resolution when $\geq 5 \mu\text{s}/\text{div}$ @ 5 GSa/s (or $\geq 10 \mu\text{s}/\text{div}$ @ 2.5 GSa/s).
Memory Depth	single-channel: Auto, 14k pts, 140k pts, 1.4M pts, 14M pts and 140M pts are available dual-channel: Auto, 7k pts, 70k pts, 700k pts, 7M pts and 70M pts are available

## Input

Number of Channels	DS6XX4: four channels DS6XX2: two channels
Input Coupling	DC, AC or GND
Input Impedance	$(1 \text{ M}\Omega \pm 1\%) \parallel (14 \text{ pF} \pm 3 \text{ pF})$ or $50 \Omega \pm 1.5\%$

**RIGOL**

Probe Attenuation Coefficient	0.001X, 0.01X, 0.1X, 1X, 10X, 100X, 1000X
Maximum Input Voltage (1M $\Omega$ )	Maximum Input Voltage of the Analog Channel CAT I 300 Vrms, CAT II 100 Vrms, Transient Overvoltage 1000V pk with RP2200 10:1 probe: CAT II 300 Vrms with RP3300 10:1 probe: CAT II 300 Vrms with RP3500 10:1 probe: CAT II 300 Vrms with RP5600 10:1 probe: CAT II 300 Vrms

**Horizontal**

Timebase Scale	DS606X: 1 ns/div to 50 s/div DS610X: 500 ps/div to 50 s/div
Timebase Accuracy	$\leq \pm(15 + 2 \times \text{instrument age in years})$ ppm
Delay Range	Pre-trigger (negative delay): $\geq 1$ screen width Post-trigger (positive delay): 1 s to 1000 s
Timebase Mode	Y-T, X-Y, Roll, Time Delayed
Number of XYs	2 simultaneously
Waveform Capture Rate <sup>1</sup>	150,000 wfms (vector display); 180,000 wfms (dots display)

**Vertical**

Bandwidth (-3dB)	DS606X: DC to 600 MHz DS610X: DC to 1 GHz
Single-shot Bandwidth	DS606X: DC to 600 MHz DS610X: DC to 1 GHz (each channel)
Vertical Resolution	8bits, two channels sample at the same time
Vertical Scale	2 mV/div to 5 V/div (1 M $\Omega$ ) 2 mV/div to 1 V/div (50 $\Omega$ )
Offset Range	2 mV/div to 120 mV/div: $\pm 1.2V$ (50 $\Omega$ ) 125 mV/div to 1 V/div: $\pm 12V$ (50 $\Omega$ ) 2 mV/div to 225 mV/div: $\pm 2V$ (1M $\Omega$ )

	230 mV/div to 5 V/div: $\pm 40V (1M\Omega)$
Bandwidth Limit <sup>2</sup>	20 MHz or 250 MHz
Low Frequency Response (AC Coupling -3dB)	$\leq 5$ Hz (on BNC)
Calculated Rise Time <sup>2</sup>	DS606X: 600 ps DS610X: 400 ps
DC Gain Accuracy	$\pm 2\%$ full scale
DC Offset Accuracy	200 mV/div to 5 V/div: 0.1 div $\pm 2$ mV $\pm 0.5\%$ offset value 2 mV/div to 195 mV/div: 0.1 div $\pm 2$ mV $\pm 1.5\%$ offset value
ESD Tolerance	$\pm 2$ kV
Channel to Channel Isolation	DC to maximum band width: $>40$ dB

## Trigger

Trigger Level Range	Internal	$\pm 6$ div from center screen
	EXT	$\pm 0.8$ V
Trigger Mode	Auto, Normal, Single	
Holdoff Range	100 ns to 10 s	
High Frequency Rejection <sup>2</sup>	50 kHz	
Low Frequency Rejection <sup>2</sup>	5 kHz	

### Edge Trigger

Edge Type	Rising, Falling, Rising&Falling
-----------	---------------------------------

### Pulse Trigger

Pulse Condition	Positive Pulse Width (greater than, lower than, within specific interval) Negative Pulse Width (greater than, lower than, within specific interval)
Pulse Width Range	4 ns to 4 s

### Slope Trigger

Slope Condition	Positive Slope (greater than, lower than, within specific interval)
-----------------	---

**RIGOL**

	Negative Slope (greater than, lower than, within specific interval)
Time Setting	10 ns to 1 s
<b>Video Trigger</b>	
Signal Standard Line Frequency Range	Support standard NTSC, PAL and SECAM broadcasting standards, the range of the number of lines is from 1 to 525 (NTSC) and 1 to 625 (PAL/SECAM)
<b>Pattern Trigger</b>	
Pattern Setting	H, L, X, Rising Edge, Falling Edge
<b>RS232/UART Trigger</b>	
Trigger Condition	Start, Error, Check Error, Data
Baud Rate	2400bps, 4800bps, 9600bps, 19200bps, 38400bps, 57600bps, 115200bps, User
Data Bits	5 bit, 6 bit, 7 bit, 8 bit
<b>I2C Trigger</b>	
Trigger Condition	Start, Restart, Stop, Missing ACK, Address, Data, A&D
Address Bits	7 bit, 10 bit
Address Range	0 to 119, 0 to 1023
Byte Length	1 to 5
Data Qualifier	Equal to, Greater than, Less than
<b>SPI Trigger</b>	
Trigger Condition	CS, Timeout
Timeout Value	100 ns to 1 s
Data Bits	4 bit to 32 bit
Data Line Setting	H, L, X
Clock Edge	Rising Edge, Falling Edge
Signal Type	Rx, Tx, CAN_H, CAN_L, Differential
<b>CAN Trigger</b>	
Trigger Condition	SOF, EOF, Frame Type
Baud Rate	10kbps, 20kbps, 33.3kbps, 50kbps, 62.5kbps, 83.3kbps, 100kbps, 125kbps, 250kbps, 500kbps, 800kbps, 1Mbps, User
Sample Point	5% to 95%
Frame Type	Data, Remote, Error, OverLoad
<b>USB Trigger</b>	
Signal Speed	Low Speed, Full Speed

Trigger condition	SOP, EOP, RC, Suspended, Exit Suspended
-------------------	---

## Measure

Cursor	Manual Mode	Voltage Deviation between Cursors ( $\Delta V$ ) Time Deviation between Cursors ( $\Delta T$ ) Reciprocal of $\Delta T$ (Hz) ( $1/\Delta T$ )
	Track Mode	Voltage and Time Values of the Waveform Point
	Auto Mode	Allow to display cursors during auto measurement
Auto Measurement	Measurements of Maximum, Minimum, Peak-Peak Value, Top Value, Bottom Value, Amplitude, Average, Mean Square Root, Overshoot, Pre-shoot, Frequency, Period, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, Delay A→B $\uparrow$ , Delay A→B $\downarrow$ , Phase A→B $\uparrow$ , Phase A→B $\downarrow$	
Number of Measurements	Display 5 measurements at the same time.	
Measurement Range	Screen or cursor.	
Measurement Statistic	Average, Max, Min, Standard Deviation, Number of Measurements	
Frequency Counter	Hardware 6 bits frequency counter (channels available: DS606x, CH1/CH2; DS610x, CH1/CH2/CH3/CH4)	

## Math Operation

Waveform Operation	A+B, A-B, A×B, A/B, FFT, Editable Advanced Operation, Logic Operation
FFT Window Function	Rectangle, Hanning, Blackman, Hamming
FFT Display	Split, Full Screen

	230 mV/div to 5 V/div: $\pm 40V (1M\Omega)$
Bandwidth Limit <sup>2</sup>	20 MHz or 250 MHz
Low Frequency Response (AC Coupling -3dB)	$\leq 5$ Hz (on BNC)
Calculated Rise Time <sup>2</sup>	DS606X: 600 ps DS610X: 400 ps
DC Gain Accuracy	$\pm 2\%$ full scale
DC Offset Accuracy	200 mV/div to 5 V/div: 0.1 div $\pm 2$ mV $\pm 0.5\%$ offset value 2 mV/div to 195 mV/div: 0.1 div $\pm 2$ mV $\pm 1.5\%$ offset value
ESD Tolerance	$\pm 2$ kV
Channel to Channel Isolation	DC to maximum band width: $>40$ dB

## Trigger

Trigger Level Range	Internal	$\pm 6$ div from center screen
	EXT	$\pm 0.8$ V
Trigger Mode	Auto, Normal, Single	
Holdoff Range	100 ns to 10 s	
High Frequency Rejection <sup>2</sup>	50 kHz	
Low Frequency Rejection <sup>2</sup>	5 kHz	

### Edge Trigger

Edge Type	Rising, Falling, Rising&Falling
-----------	---------------------------------

### Pulse Trigger

Pulse Condition	Positive Pulse Width (greater than, lower than, within specific interval) Negative Pulse Width (greater than, lower than, within specific interval)
Pulse Width Range	4 ns to 4 s

### Slope Trigger

Slope Condition	Positive Slope (greater than, lower than, within specific interval)
-----------------	---

**RIGOL**

Probe Attenuation Coefficient	0.001X, 0.01X, 0.1X, 1X, 10X, 100X, 1000X
Maximum Input Voltage (1M $\Omega$ )	Maximum Input Voltage of the Analog Channel CAT I 300 Vrms, CAT II 100 Vrms, Transient Overvoltage 1000V pk with RP2200 10:1 probe: CAT II 300 Vrms with RP3300 10:1 probe: CAT II 300 Vrms with RP3500 10:1 probe: CAT II 300 Vrms with RP5600 10:1 probe: CAT II 300 Vrms

**Horizontal**

Timebase Scale	DS606X: 1 ns/div to 50 s/div DS610X: 500 ps/div to 50 s/div
Timebase Accuracy	$\leq \pm(15 + 2 \times \text{instrument age in years})$ ppm
Delay Range	Pre-trigger (negative delay): $\geq 1$ screen width Post-trigger (positive delay): 1 s to 1000 s
Timebase Mode	Y-T, X-Y, Roll, Time Delayed
Number of XYs	2 simultaneously
Waveform Capture Rate <sup>1</sup>	150,000 wfms (vector display); 180,000 wfms (dots display)

**Vertical**

Bandwidth (-3dB)	DS606X: DC to 600 MHz DS610X: DC to 1 GHz
Single-shot Bandwidth	DS606X: DC to 600 MHz DS610X: DC to 1 GHz (each channel)
Vertical Resolution	8bits, two channels sample at the same time
Vertical Scale	2 mV/div to 5 V/div (1 M $\Omega$ ) 2 mV/div to 1 V/div (50 $\Omega$ )
Offset Range	2 mV/div to 120 mV/div: $\pm 1.2$ V (50 $\Omega$ ) 125 mV/div to 1 V/div: $\pm 12$ V (50 $\Omega$ ) 2 mV/div to 225 mV/div: $\pm 2$ V (1M $\Omega$ )