

## 16 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 $50 \Omega \pm 1.5\%$

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Probe Attenuation Coefficient	0.001X, 0.01X, 0.1X, 1X, 2X, 5X, 10X, 20X, 50X, 100X, 200X, 500X, 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 $\Omega$ )

	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
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### 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)
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	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	1 to 127
Data Range	0 to 255
Data Qualifier	Equal to, Greater than, Less than
<b>SPI Trigger</b>	
Trigger Condition	CS, Timeout
Timeout Value	100 ns to 999 ns
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
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## 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

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FFT Vertical Scale	Linear RMS, dBV RMS
Logic Operation	AND, OR, NOT, XOR
Math Function	Intg, Diff, Log, Exp, Sqrt, Sine, Cosine, Tangent
Number of Buses for Decoding	2
Decoding Type	Parallel (standard), RS232/UART (option), I2C&SPI (option)

## Display

Display Type	10.1 inches (257 mm) TFT LCD display
Display Resolution	800 Horizontal ×RGB×480 Vertical Pixel
Display Color	160,000 Color
Persistence Time	Minimum, 1 s, 2 s, 5 s, 10 s, 20 s, Infinite
Display Type	Dots, Vectors
Real-time Clock	Time and Date (user adjustable)

## I/O

Standard Ports	USB device, two USB host ports, LAN, VGA Output, 10 MHz Input/Output, Aux output ( TrigOut, Quick Edge, PassFail, Calibration, GND)
Printer Compatibility	PictBridge

## General Specifications

### Probe Compensation Output

Output Voltage <sup>2</sup>	About 3 V, peak-peak
Frequency <sup>2</sup>	1kHz

### Power

Power Voltage	100-120 V/45-440 Hz
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	100-240 V/45-65 Hz	
Power	Maximum 150W	
Fuse	3 A, T Degree, 250 V	
<b>Environment</b>		
Temperature Range	Operating: 0 °C to +50 °C	
	Non-operating: -20 °C to +70 °C	
Cooling Method	fan cooling	
Humidity Range	Under +35 °C: ≤90% Relative Humidity	
	+35 °C to +50 °C: ≤60% Relative Humidity	
Altitude	Operating: under 3,000 meters	
	Non-operating: under 15,000 meters	
<b>Physical Characteristics</b>		
Size <sup>3</sup>	Width×Height×Depth = 399.0 mm×255.3 mm×123.8 mm	
Weight <sup>4</sup>	Package Excluded	5.345 ± 0.2 kg
	Package Included	10.8 ± 1 kg
<b>Calibration Interval</b>		
The recommended calibration interval period is one year.		
<b>Regulatory Information</b>		
Electromagnetic Compatibility	2004/108/EC Execution standard EN 61326-1:2006 EN 61326-2-1:2006	
Safety	UL 61010-1:2004 ; CAN/CSA-C22.2 NO. 61010-1-2004 ; EN 61010-1:2001 ; IEC 61010-1:2001	

- 1 Maximum value. In single-channel mode, sine signal with 10 ns horizontal scale, 4 div input amplitude and 10 MHz frequency, edge trigger.
- 2 Typical.
- 3 Tilt tabs and handle folded, knob height included, front panel cover excluded.
- 4 DS1064 model, standard configuration.





# 17 Appendix

## Appendix A: Options and Accessories

	Description	Order Number
<b>Model</b>	DS6104 (1 GHz, 4-channel)	DS6104
	DS6102 (1 GHz, dual-channel)	DS6102
	DS6064 (600 MHz, 4-channel)	DS6064
	DS6062 (600 MHz, dual-channel)	DS6062
<b>Standard Accessories</b>	Power Cord conforming to the standard of the country	-
	Front Panel Cover	FPC-DS-6
	USB Cable	CB-USB-150
	2 or 4 Passive Probes (600 MHz)	RP5600 (for DS610X)
	2 or 4 Passive Probes (500 MHz)	RP3500 (for DS606X)
	Quick Guide	-
<b>Optional Accessories</b>	Resource CD (User's Guide and Application Software)	-
	Active Differential Probe (1.5 GHz)	RP7150
	Passive Probe (1.5 GHz, 500 $\Omega$ Input)	RP6150
	Update RP3500 to RP5600	UP-RP35to56
	11.1 V, 147 Wh Lithium Battery Set	BAT
	USB to GPIB Module	USB-GPIB
	Desk Mount Instrument Arm	ARM
Rack Mount Kit	RM-DS-6	
<b>Decoding Options</b>	RS232/UART Decoding Kit	SD-RS232-DS6
	I2C&SPI Decoding Kit	SD-I2C&SPI -DS6

**NOTE: All the options or accessories can be ordered from you local RIGOL Office.**