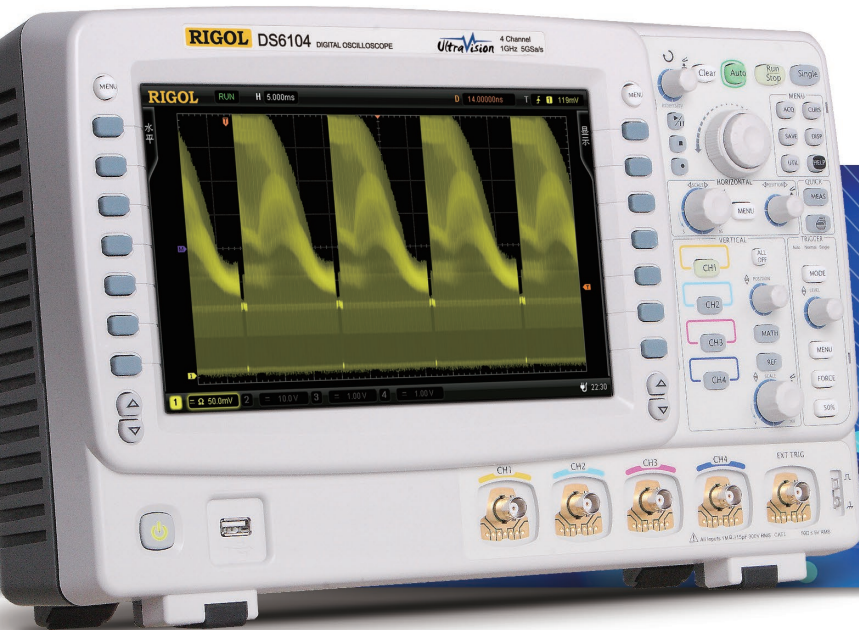


**RIGOL**  
Innovation or nothing

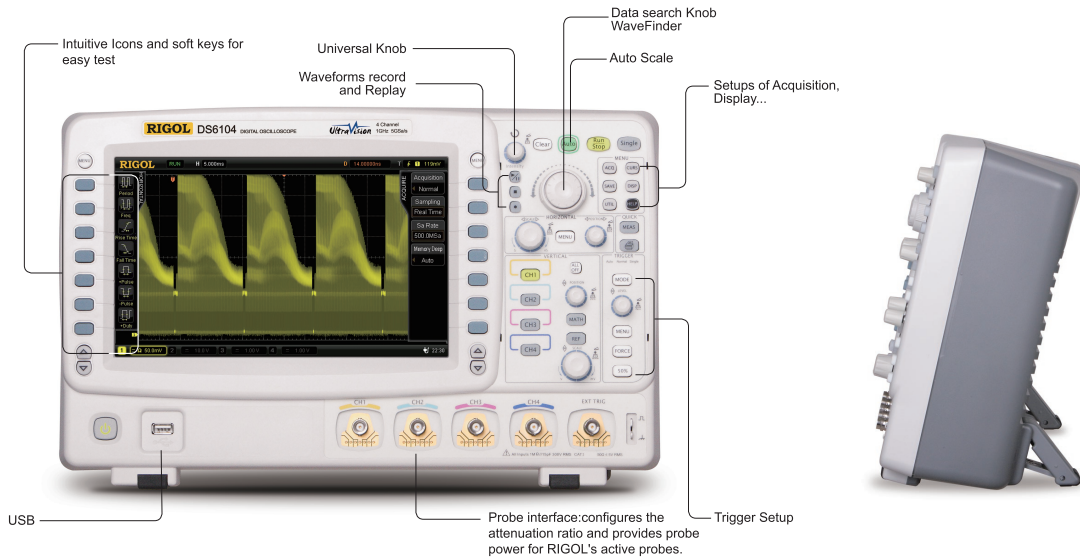


# DS6000 Series Digital Oscilloscope

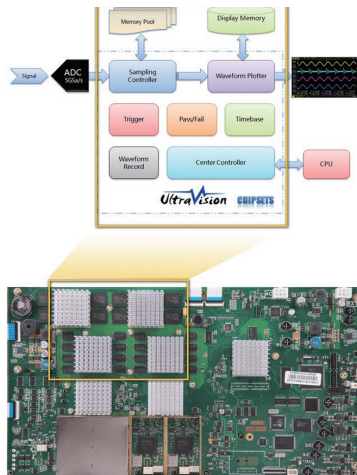
- Bandwidth 1GHz, 600 MHz
- Sample Rate Up to 5 GSa/s
- 2 or 4 channels
- Memory depth up to 140 Mpts(Std.)
- Waveform capture rate Up to 180,000 waveforms per second,
- Real Time Waveform Record, Replay & Analysis(Std. up to 200,000 frames)
- Innovative “UltraVision” technology
- A variety of Trigger functions and Automatic measurements with statistics
- Support serial bus trigger(Std.) and decoding(Opt.)
- Dedicated data search knob “WaveFinder”
- Battery Option (China Only)
- Complete Connectivity: USB, LAN(LXI-C), VGA, AUX, GPIB(Option)
- Built-in 1 GBytes Flash Memory
- 10.1-inch WVGA(800X480) Display

DS6000 series adopts many today's new technologies to achieve high performance, abundant features in the same class. It's designed to aim at the largest digital oscilloscope market segment in the fields of communications, semiconductor, computing, aerospace defense, instrumentation, research/education, industrial electronics, consumer electronics and automotive industries with its innovative technology, industry leading specifications, powerful trigger functions and broad analysis capabilities.

# DS6000 Series Digital Oscilloscope



Product Dimensions: Width x Height x Depth=399mm x 255.3mm x 123.8mm Weight:5.35 kg



**UltraVision**

- Deeper Memory Depth(Std.140Mpts)
- Higher Waveform capture rate (Up to 180,000 wfms/s)
- Real Time waveform Record,Replay & Analysis (Up to 200,000 frames)
- Multi-level intensity grading display

## ► Models and key Specs

Model	DS6104	DS6102	DS6064	DS6062
Bandwidth	1 GHz	1 GHz	600 MHz	600 MHz
Max. Sample rate	5 GSa/s	5 GSa/s	5 GSa/s	5 GSa/s
Memory(Standard)	140 Mpts	140 Mpts	140 Mpts	140 Mpts
Channels	4	2	4	2
Waveform capture rate	Up to 180,000 waveforms per second			
Frames recorded	Up to 200,000 frames			

## ► Features and Benefits

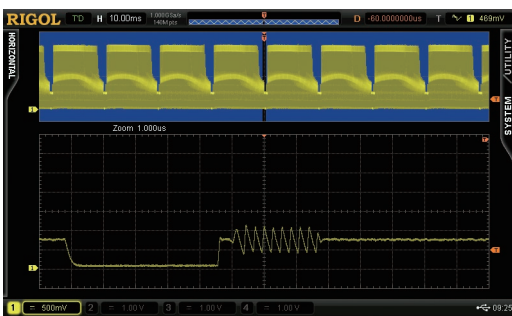
UltraVision: Up to 180K Waveforms/s Waveform capture rate



UltraVision: Real time waveform Record,Replay & Analysis



UltraVision: Multi-Level intensity grading display



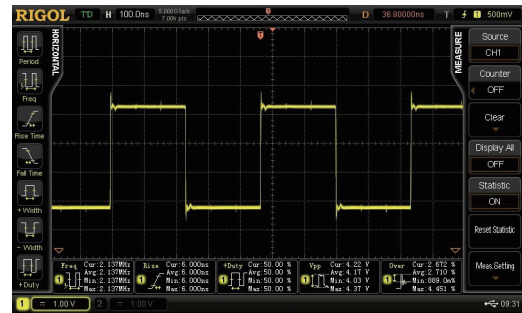
Advanced math function



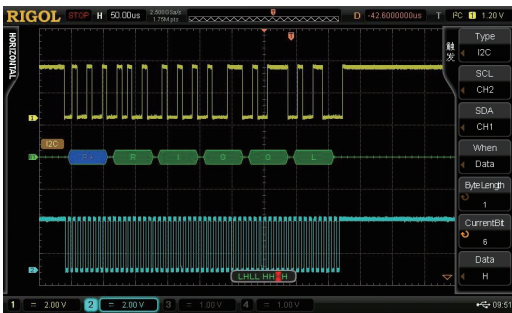
Standard Mask test function



Auto measurements with statistics(Measure up to 5 parameters simultaneously)



Standard Serial Bus trigger functions (RS232,I2C,SPI,CAN etc.)




Optional Serial bus decoding function with listing display




## The probes supported by DS6000 series:

### ▶ RIGOL Passive Probes

Model Number	Type	Description
 RP2200	High Z Probe	1X: DC~7MHz 10X:DC~150MHz Compatibility: All RIGOL Scopes.
 RP3300A	High Z Probe	1X: DC~8MHz 10X:DC~350MHz Compatibility: All RIGOL Scopes.
 RP3500A	High Z Probe	DC~500MHz Compatibility: All RIGOL Scopes.
 RP5600A	High Z Probe	DC~600MHz Compatibility: DS4000,6000 Series.
 RP6150A	Low Z Probe	DC~1.5GHz Compatibility: DS4000,6000 Series.
 RP1300H	High Voltage Probe	DC~300MHz CATI 2000V(DC+AC), CATII 1500 V(DC+AC) Compatibility: All RIGOL Scopes.
 RP1050H	High Voltage Probe	DC~50MHz DC:0~15KV DC,AC:pulse <=30KVp-p, AC:sine wave <=10KVrms Compatibility: All RIGOL Scopes.

### ▶ RIGOL Active & Current Probes

Model Number	Type	Description
 RP7150	Differential /Single ended Probe	BW:DC~1.5GHz,30V Peak, CAT I Compatibility: DS4000, 6000 series.
 RP1001C	Current Probe	BW:DC~300kHz, Max.DC: ± 100A, AC P-P:200A,AC RMS:70A Compatibility: All RIGOL Scopes.
 RP1002C	Current Probe	BW:DC~1MHz, Max.DC: ± 70A, AC P-P:140A,AC RMS:50A Compatibility: All RIGOL Scopes.
 RP1003C	Current Probe	BW:DC~50MHz, Max.AC RMS:30A AC Peak:50A(Noncontinuous) Compatibility: All RIGOL Scopes. Must order RP1000P Power supply.
 RP1004C	Current Probe	BW:DC~100MHz, Max. AC RMS:30A, AC Peak:50A(Noncontinuous) Compatibility: All RIGOL Scopes. Must order RP1000P Power supply.
 RP1005C	Current Probe	BW:DC~10MHz, Max.150 A rms, 300 A peak (Noncontinuous), 500 A peak (@pulse width <=30 ms) Compatibility: All RIGOL Scopes. Must order RP1000P Power supply.
 RP1000P	Power Supply	Power supply for RP1003C,RP1004C,RP1005C, support 4 channels.
 RP1025D	High Voltage Differential Probe	BW:25MHz; Max. Voltage ≤ 1400Vpp Compatibility: All RIGOL Scopes.
 RP1050D	High Voltage Differential Probe	BW:50MHz; Max. Voltage ≤ 7000Vpp Compatibility: All RIGOL Scopes.
 RP1100D	High Voltage Differential Probe	BW:100MHz; Max. Voltage ≤ 7000Vpp Compatibility: All RIGOL scopes

► Other accessories



ARM option



Optional USB-GPIB adapter for remote control



Rack mount kit option

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 bit 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, GND
Input Impedance	$(1 \text{ M}\Omega \pm 1\%) \parallel (13 \text{ pF} \pm 3 \text{ pF})$ or $50 \Omega \pm 1.5\%$
Probe Attenuation Coefficient	0.01X to 1000X, in 1-2-5 step
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 RP3300A 10:1 probe: CAT II 300 Vrms with RP3500A 10:1 probe: CAT II 300 Vrms with RP5600A 10:1 probe: CAT II 300 Vrms

Horizontal	
Timebase Scale	DS606X: 1 ns to 1000 s DS610X: 500 ps to 1000 s
Deviation Between Channels	$\pm 0.5 \text{ div} \cdot \text{minimum time base}$
Max Recording Length	140 Mpts
Timebase Accuracy	$\leq \pm 4 \text{ ppm}$
Clock Drift	$\leq \pm 2 \text{ ppm/year}$
Delay Range	Pre-trigger (negative delay): memory depth/sample rate Post-trigger (positive delay): 1 s to 100,000 s
Timebase Mode	Y-T, X-Y, Roll, Delayed Sweep
Number of X-Ys	2 paths simultaneously (four-channel models)
Waveform Capture Rate <sup>(1)</sup>	150,000 wfms (vector display); 180,000 wfms (dots display)
Zero Point Offset	$\pm 0.5 \text{ div} \cdot \text{minimum time base}$

<b>Vertical</b>	
Bandwidth (-3 dB) (1M $\Omega$ )	DC to 500 MHz
Single-shot Bandwidth (1M $\Omega$ )	DC to 500 MHz
Bandwidth (-3 dB) (50 $\Omega$ )	DS606X: DC to 600 MHz DS610X: DC to 1 GHz (single channel)
Single-shot Bandwidth (50 $\Omega$ )	DS606X: DC to 600 MHz DS610X: DC to 1 GHz (single channel)
Vertical Resolution	8 bits, 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 124 mV/div: $\pm 1.2$ V (50 $\Omega$ ) 126 mV/div to 1 V/div: $\pm 12$ V (50 $\Omega$ ) 2 mV/div to 225 mV/div: $\pm 2$ V (1 M $\Omega$ ) 230 mV/div to 5 V/div: $\pm 40$ V (1 M $\Omega$ )
Bandwidth Limit <sup>[2]</sup>	20 MHz or 250 MHz
Low Frequency Response (AC Coupling -3 dB)	$\leq 5$ Hz (on BNC)
Calculated Rise Time <sup>[5]</sup> (10%-90%,50 $\Omega$ )	DS606X: 600 ps (single channel) DS610X: 400 ps (single channel)
DC Gain Accuracy	$\pm 2\%$ full scale
DC Offset Accuracy	200 mV/div to 5 V/div: $\pm 0.1$ div $\pm 2$ mV $\pm 0.5\%$ offset value 1 mV/div to 195 mV/div: $\pm 0.1$ 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

<b>Trigger</b>		
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	
<b>Edge Trigger</b>		
Edge Type	Rising, Falling, Rising&Falling	
<b>Pulse Trigger</b>		
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	
<b>Slope Trigger</b>		
Slope Condition	Positive Slope (greater than, lower than, within specific interval) Negative Slope (greater than, lower than, within specific interval)	
Time Setting	10 ns to 1 s	
<b>Video Trigger</b>		
Signal Standard	Support standard NTSC, PAL and SECAM broadcasting standards; support 480P, 576P, 720P, 1080P and 1080I HDTV standards	
<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	
Polarity	Normal, Invert	
Baud Rate	2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, 230400 bps, 460800 bps, 921600 bps, 1 Mbps, 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, 8 bit, 10 bit	

Address Range	0 to 127, 0 to 255, 0 to 1023
Byte Length	1 to 5
<b>SPI Trigger</b>	
Trigger Condition	CS, Timeout
Timeout Value	100 ns to 1 s
Data Bits	4 bit to 32 bit
Data	H, L, X
Clock Edge	Rising Edge, Falling Edge
<b>CAN Trigger</b>	
Signal Type	Rx, Tx, CAN_H, CAN_L, Differential
Trigger Condition	SOF, EOF, Frame Type, Frame Error
Baud Rate	10 kbps, 20 kbps, 33.3 kbps, 50 kbps, 62.5 kbps, 83.3 kbps, 100 kbps, 125 kbps, 250 kbps, 500 kbps, 800 kbps, 1 Mbps, User
Sample Point	5% to 95%
Frame Type	Data, Remote, Error, OverLoad
Error Frame Type	Bit Fill , Answer Error, Check Error, Format Error, Random Error
<b>FlaxRay Trigger</b>	
Baud Rate	2.5 Mb/s, 5 Mb/s, 10 Mb/s
Trigger Condition	Frame, Symbol, Error, TSS
<b>USB Trigger</b>	
Signal Speed	Low Speed, Full Speed
Trigger condition	SOP, EOP, RC, Suspend , ExitSuspend

## 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	Max imum, Minimum, Peak-Peak Value, Top Value, Base Value, Amplitude, Average, Vrms-N, Vrms-1, Overshoot, Pre-shoot, Area, Period Area, Frequency, Period, Rise Time, Fall Time, Positive Pulse Width, Negative Pulse Width, Positive Duty Cycle, Negative Duty Cycle, Delay A $\rightarrow$ B, Delay A $\rightarrow$ B, Delay A $\rightarrow$ B, Delay A $\rightarrow$ B, Phase A $\rightarrow$ B, Phase A $\rightarrow$ B, Phase A $\rightarrow$ B, Phase A $\rightarrow$ B	
Number of Measurements	Display 5 measurements at the same time.	
Measurement Range	Screen, Cursor	
Statistic Mode	Extremum, Difference	
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
FFT Vertical Scale	Vrms, dB
Anti-aliasing	OFF
Logic Operation	AND, OR, NOT, XOR
Math Function	Intg, Diff, Lg , Exp, Sqrt, Sine, Cosine, Tangent
Number of Buses for Decoding	2
Decoding Type	Parallel (standard), RS232/UART (option), I2C (option) , SPI (DS6XX4 option), CAN (option), FlaxRay (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, 50 ms, 100 ms, 200 ms, 500ms, 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	Dual USB HOST , USB device , LAN, VGA Output, 10 MHz Input/Output, Aux output (TrigOut, Fast, GND, PassFail)
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	100-127 V, 45-440 Hz 100-240 V, 45-65 Hz
Power	Maximum 150W
Fuse	3 A, T Degree, 250 V

### Environment

Temperature Range	Operating: 0°C to +50°C Non-ope rating: -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

### Mechanical Characteristics

Size <sup>[3]</sup>	W × H × D = 399.0 mm × 255.3 mm × 123.8 mm	
Weight <sup>[4]</sup>	Package Excluded	5.345 kg ± 0.2 kg
	Package Included	10.8 kg ± 1 kg

### Calibration Interval

The recommended calibration interval is one year.

### Regulatory Information

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

**Note**<sup>[1]</sup>: Maximum value. In single-channel mode, sine signal with 10 ns horizontal scale, 4 div input amplitude and 10 MHz frequency, edge trigger.

**Note**<sup>[2]</sup>: Typical.

**Note**<sup>[3]</sup>: Supporting legs and handle folded, knob height included, front panel cover excluded.

**Note**<sup>[4]</sup>: DS6104 model, standard configuration.

**Note**<sup>[5]</sup>: Typical. In equivalent-time sampling, the calculated rising time =  $\sqrt{(\text{measured rising time})^2 - (\text{rising time of the fast-edge source})^2}$



Regulatory Information		
Electromagnetic compatibility	Meets EMC Directive(2014/30/EU), meets or exceeds IEC61326-1:2013/EN 61326-1:2013 Group 1 Class A requirement	
	CISPR 11/EN 55011	
	IEC 61000-4-2:2008/EN 61000-4-2	±4.0 kV(contact discharge), ±8.0 kV(air discharge)
	IEC 61000-4-3:2002/EN 61000-4-3	3 V/m(80 MHz to 1 GHz); 3 V/m(1.4 GHz to 2 GHz); 1 V/m(2.0 GHz to 2.7 GHz)
	IEC 61000-4-4:2004/EN 61000-4-4	1 kV power line
	IEC 61000-4-5:2001/EN 61000-4-5	0.5 kV(phase to neutral point voltage); 1 kV(phase to ground voltage); 1 kV(neutral to ground voltage)
	IEC 61000-4-6:2003/EN 61000-4-6	3 V, 0.15-80 MHz
	IEC 61000-4-11:2004/EN 61000-4-11	Voltage drop: 0% UT during half cycle; 0% UT during 1 cycle; 70% UT during 25 cycles Short supply interruption: 0% UT during 250 cycles
Safety	IEC 61010-1:2010 (Third Edition)/EN 61010-1:2010, UL 61010-1:2012 R4.16 and CAN/CSA-C22.2 NO. 61010-1-12+ GI1+ GI2	

## ► Ordering Information

	Description	Order Number
Model	DS6104 (1 GHz, 4-channel)	DS6104
	DS6102 (1 GHz, dual-channel)	DS6102
	DS6064 (600 MHz, 4-channel)	DS6064
	DS6062 (600 MHz, dual-channel)	DS6062
Standard Accessories	Power Cord conforming to the standard of the country	--
	Front Panel Cover	FPCS-DS6000
	USB Cable	CB-USBA-USBB-FF-150
	2 or 4 Passive Probes (600 MHz)	RP5600A
	1 or 2 Passive Probes (1.5 GHz)	RP6150A (for DS610X)
	Quick Guide	--
Optional Accessories	Active Differential Probe (1.5 GHz)	RP7150
	Passive Probes (500 MHz)	RP3500A
	11.1 V, 147 Wh Lithium Battery Set	BAT
	USB to GPIB Interface Converter	USB-GPIB
	Desk Mount Instrument Arm	ARM
	Rack Mount Kit	RM-DS6000
	TekProbe Interface Adaptor	T2R1000
Decoding Options	RS232/UART Decoding Kit	SD-RS232-DS6000
	I2C /SPI Decoding Kit	SD-I2C/SPI-DS6000
	CAN Decoding Kit	SD-CAN-DS6000
	FlexRay Decoding Kit	SD-FLEXRAY-DS6000

## Warranty

Three-year warranty, excluding probes and accessories.

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