RIGOL
Beyond Measure

2011

No.2

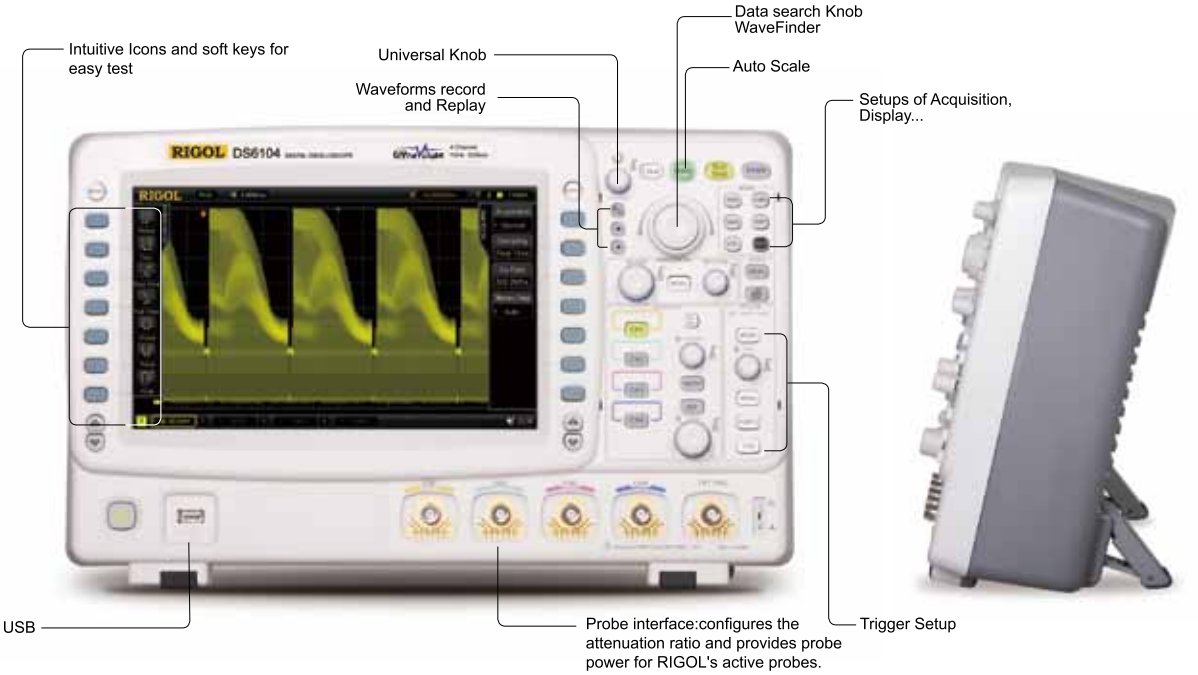
DS6000 Series Digital Oscilloscope

- Bandwidth 1 GHz, 600 MHz
- Sample Rate Up to 5 GSa/s
- Channels 2 or 4
- Memory 140 Mpts (Standard)
- Capture rate Up to 180,000 waveforms per second
- Waveform recording Up to 180,000 frames
- Innovative “UltraVision” technology
- A variety of Trigger functions and Automatic measurements with statistics
- Support serial bus trigger and decode
- Dedicated data search knob“ WaveFinder ”
- Complete Connectivity USB,LAN(LXI-C),WVGA ,GPIB(Option)...
- Built-in 1GBytes Flash Memory
- Battery power option

DS6000 series adopt many today's new technologies to achieve high performance, abundant features in the same class. It's designed to aim at the requirements of the largest digital oscilloscope market segment from the 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.

RIGOL TECHNOLOGIES, INC.

DS6000 Series Digital Oscilloscope



Product Dimensions：Width × Height × Depth=399mm × 255.3mm × 123.8mm Weight:5.35 kg(without battery)

► Key features of DS6000 series

1. Industry-leading specifications

- Up to 1 GHz BW with 5 GSa/s sample rate
- Standard 140 Mpts deep memory
- Up to 180,000 waveforms per second capture rate
- Up to 180,000 frames for waveform record and replay

2. Innovative UltraVision technology

- Deeper Memory Depth(Std.140M pts)
- Higher Waveform capture rate (Up to 180wfms/s)
- Real Time waveform record & replay
- Multi-level intensity grading display

3.Broad applications

- A variety of Trigger functions and Automatic measurements with statistics
- Serial bus trigger and decode such as I2C, SPI, RS232, CAN…
- Advanced math function
- Complete Connectivity
- A variety of Probes and accessories

4. Attractive profile

- Large display: 10.1 inch WVGA (800x480), LED backlight
- Shallow depth: reduces the space occupied
- Light weight: easy for hand carry even with battery power option

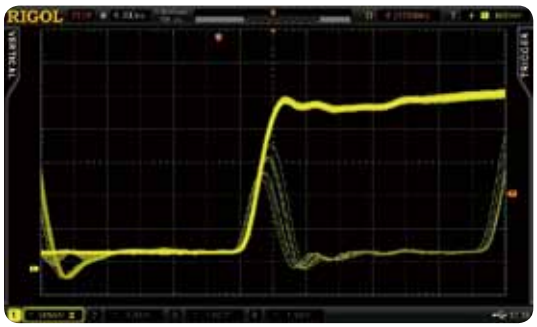
Model	DS6104	DS6102	DS6064	DS6062
Bandwidth	1 GHz	1 GHz	600 MHz	600 MHz
Max. Sample rate	5 GSa/s	5 GSa/s	5 GSa/s	5 GSa/s
Memory(Standard)	140 Mpts	140 Mpts	140 Mpts	140 Mpts
Channels	4	2	4	2
Waveform capture rate	Up to 180,000 waveforms per second			
Frames recorded	Up to 180,000 frames			

► Recommended RIGOL probes

Model	Descriptions
RP5600	600MHz Passive Probe (Standard for all models, 4 sets for 4 channel models, 2 sets for 2 channel models)
RP6150	1.5GHz Passive Probe(Standard for 1GHz models:2 sets for DS6104, 1 set for DS6102)
RP7150	1.5GHz Active Probe(Optional for all models)
RP3500	500MHz Passive Probe(Optional for all models)

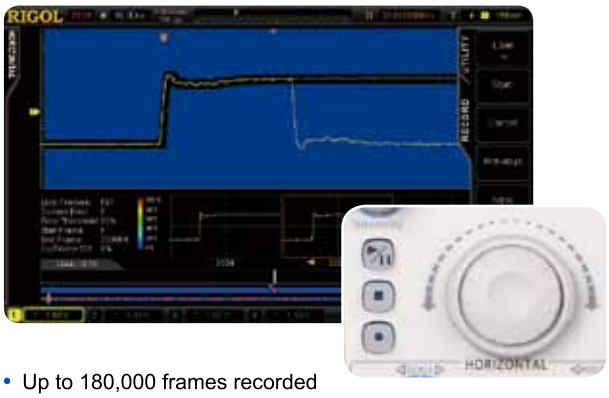
► Features and Benefits

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



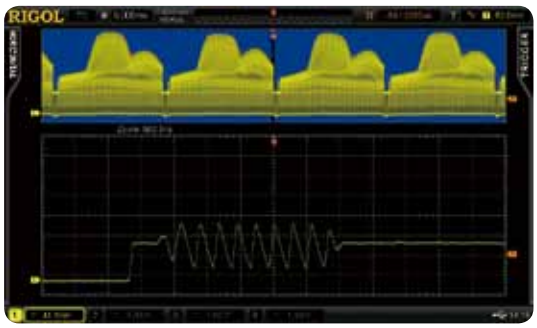
Find the infrequent problem easily

UltraVision: Realtime waveform record,replay, analysis function (std.)



- Up to 180,000 frames recorded
- "WaveFinder"--Dedicated data search knob
- Replay and analyze the recorded waveforms

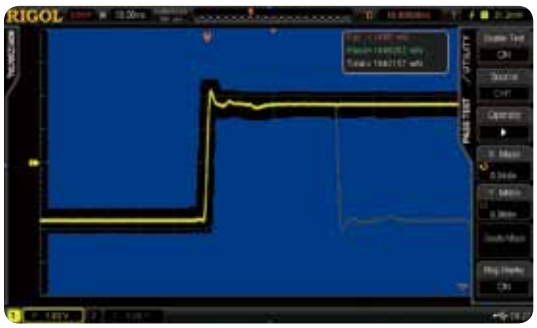
UltraVision: Deeper Memory with Multi-Level intensity grading display



Provide the capability to see both the panorama and detail simultaneously

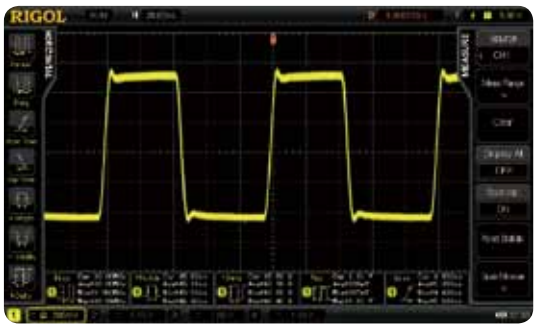
Advanced math function (user defined)

Mask test functions



User defined Mask,Pass/Fail counts,Stop on Fail,Fail Alarm

Automatic measurements with statistics

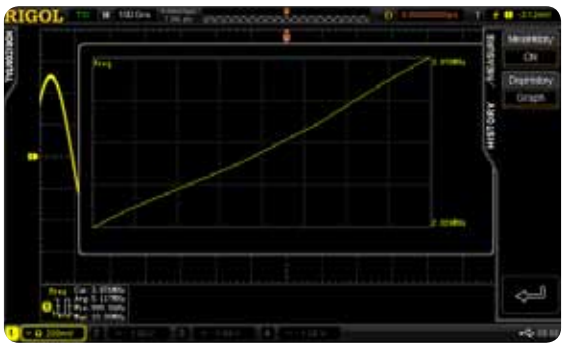


- Automatic measurements for Horizontal and vertical parameters
- Display up to 5 measurement items with statistics simultaneously
- Display all measurement items with the current value in the screen
- Intuitive icon and soft key operation for simplified testing

Serial bus decoding functions

I2C Decoding

Measurement History: Show the trend of the parameters



RS232/UART

Complete Connectivity

► The probes supported by DS6000 series:

Model Number	Attenuation Ratio	Bandwidth	Input R	Max.Input voltage	Recommended applications
RP2200	1:1 or 10:1	1X: DC~7 MHz 10X:DC~150 MHz	1X: 1MΩ ±2% 10X: 10 MΩ±2%	1X: CAT II 150 V AC 10X: CAT II 300V AC	Small signal test (1X) General purpose test
RP3300	1:1 or 10:1	1X: DC~8 MHz 10X:DC~350 MHz	1X: 1 MΩ ±2% 10X: 10 MΩ±2%	1X: CAT II 150 V AC 10X: CAT II 300V AC	Small signal test (1X) General purpose test
RP3500	10:1	DC~500 MHz	10 MΩ±2%	CAT II 300VAC	General purpose test
RP5600	10:1	DC~600 MHz	10 MΩ±2%	CAT II 300VAC	General purpose test
RP6150	10:1	DC~1.5 GHz	500 Ω±10 Ω	CAT I 10VAC	High frequency single ended small signal test
RP1300H	100:1	DC~300 MHz	100 MΩ	CAT I 2000V (DC+AC), CAT II 1500 V (DC+AC)	High voltage test
RP1050H	1000:1	DC~50 MHz	10 MΩ±0.5%	DC: 0~15KV DC AC: pulse <=30 KVp-p AC: sine wave <=10 KVrms	High voltage test
RP7150	10:1	DC~1.5 GHz	Differential mode: 50 kΩ±1% Single ended mode: 37 kΩ±1%	30V Peak, CAT I	Differential /Single ended high frequency signal test

RP2200 150MHz Passive Probe

RP3300 350MHz Passive Probe

RP6150 1.5GHz Passive Probe

RP3500 500MHz Passive Probe

RP5600 600MHz Passive Probe

- 600MHz Bandwidth
- 10:1 passive probe
- Shipped with probe positioner and its accessories
- Identified by DS6000 automatically

RP7150 1.5GHz Active Probe

- 1.5GHz Bandwidth
- Active probe supports both differential and single-ended measurements
- Shipped with the browser probe head
- Provides many kinds of probe connection accessories
- Identified by DS6000 automatically

RP1300H 300MHz High Voltage Probe

RP1050H 50MHz High Voltage Probe

▶ Other accessories

ARM option

Optional USB-GPIB adapter for remote control

Rack mount kit option

Battery power 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)
Equivalent Sample Rate	2.5 Gsa/s (dual-channel)
Peak Detect	100 Gsa/s
	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 ≥5 μs/div @ 5 GSa/s (or ≥10 μs/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 (Ground)
Input Impedance	(1 MΩ±1%) || (14 pF±3 pF)
	or 50 Ω±1.5%
Probe Attenuation Coefficient	0.001X, 0.01X, 0.1X, 1X, 2X, 5X, 10X, 20X, 50X, 100X, 200X, 500X, 1000X
Maximum Input Voltage (1MΩ)	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	≤ ±(15 + 2 ×instrument age in years) ppm
Delay Range	Pre-trigger (negative delay): ≥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[1]	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 MΩ)
	2 mV/div to 1 V/div (50 Ω)
Offset Range	2 mV/div to 120 mV/div: ± 1.2V (50 Ω)
	125 mV/div to 1 V/div: ± 12V (50 Ω)
	2 mV/div to 225 mV/div: ± 2V (1MΩ)
	230 mV/div to 5 V/div: ± 40V (1MΩ)
Bandwidth Limit[2]	20 MHz or 250 MHz
Low Frequency Response (AC Coupling -3dB)	≤5 Hz (on BNC)
DC Gain Accuracy	±2% full scale
DC Offset Accuracy	200 mV/div to 5 V/div:
	0.1 div ± 2 mV±0.5% offset value
	2 mV/div to 195 mV/div:
	0.1 div ± 2 mV±1.5% offset value
ESD Tolerance	±2 kV
Channel to Channel Isolation	DC to maximum band width: >40 dB

Trigger		
Trigger Level Range	Internal	± 6 div from center screen
	EXT	± 0.8 V
Trigger mode	Auto, Normal, Single	
Holdoff Range	100 ns to 10 s	
High Frequency Rejection[2]	50 kHz	
Low Frequency Rejection[2]	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)	
	Negative Slope (greater than, lower than, within specific interval)	
Time Setting	10 ns to 1 s	

Video Trigger		
Signal Standard	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)	
Line Frequency Range		
Pattern Trigger		
Pattern Setting	H, L, X, Rising Edge, Falling Edge	
RS232/UART Trigger		
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	
I2C Trigger		
Trigger Condition	Start, Restart, Stop, Missing ACK, Address, Data, A&D	
Address Bits	7 bit, 10 bit	
Address Range	1 to 127	
Byte Length	0 to 5	
Data Qualifier	Equal to, Greater than, Less than	
SPI Trigger		
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	
CAN Trigger		
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	
USB Trigger		
Signal Speed	Low Speed, Full Speed	
Trigger condition	SOP, EOP, RC, Suspended, Exit Suspended	

Measure		
Cursor	Manual Mode	Voltage Deviation between Cursors (△V)
		Time Deviation between Cursors (△T)
		Reciprocal of △T (Hz) (1/△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↓, Delay A~B↑, Phase A~B↓, Phase A~B↑	
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	
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(option),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[2]	About 3 V, peak-peak	
Frequency[2]	1 kHz	
Power		
Power Voltage	100-120 V/45-440 Hz	
	100-240 V/45-65 Hz	
Power	Maximum 150W	
Fuse	3 A, T Degree, 250 V	
Environment		
Temperature Range	Operation: 0℃to +50℃	
	Non-Operation: -20℃ to +70℃	
Cooling Method	fan cooling	
Humidity Range	Under +35℃: ≤90% Relative Humidity	
	+35℃ to +50℃: ≤60% Relative Humidity	
Altitude	Operation: under 3,000 meters	
	Non-Operation: under 15,000 meters	
Physical Characteristics		
Size[3]	Width×Height×Depth = 399.0 mm×255.3 mm×123.8 mm	
Weight[4]	Package Excluded	5.345 ± 0.2 kg
	Package Included	10.8 ± 1 kg
Calibration Interval		
The recommended calibration interval period 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	

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. DS6104 model, standard configuration.

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	FPC-DS-6
	USB Data Cable	CB-USB-150
	600MHz BW Passive Probe,4 sets for 4 channel models,2 sets for 2 channel models	RP5600
	1.5GHz BW Passive Probe,2 sets for DS6104,1 set for DS6102	RP6150
	Quick Guide	-
	Resource CD (User's Guide and Application Software)	-
Optional Accessories	1.5GHz Active Differential Probe	RP7150
	500MHz BW Passive Probes(Support all models)	RP3500
	600MHz BW Passive Probe(Support all models)	RP5600
	1.5GHz BW Passive Probe(Support all models)	RP6150
	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
Decoding Options	RS232/UART Decording kit	SD-RS232-DS6
	I2C Decording kit	SD-I2C-DS6
	SPI Decording kit	SD-SPI-DS6 (For DS6XX4)
	CAN Decording kit	SD-CAN-DS6

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www.rigol.com

For further information, please contact
Rigol local Distributors