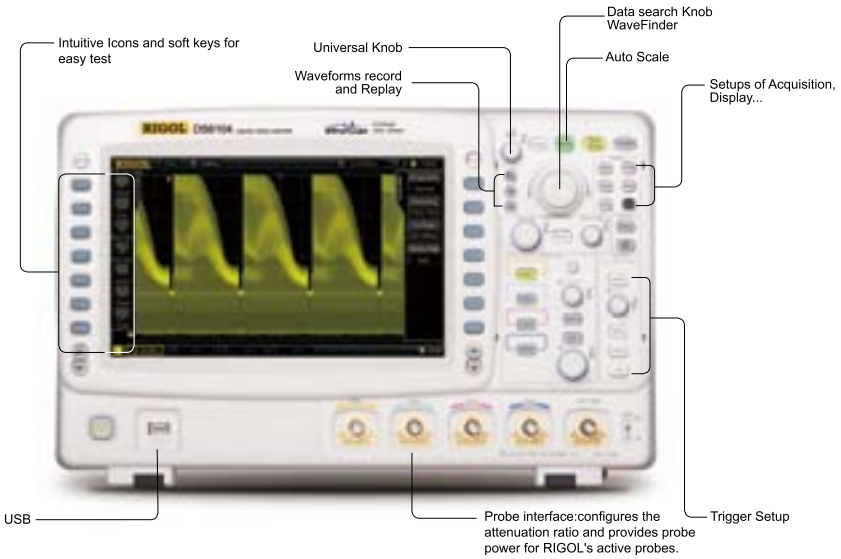
RIGOL
Beyond Measure

DS6000 Series
Digital Oscilloscope

- Bandwidth 1GHz, 600 MHz
- Sample Rate Up to 5 GSa/s
- Channels 2 or 4
- Memory 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 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.

DS6000 Series Digital Oscilloscope



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

UltraVision

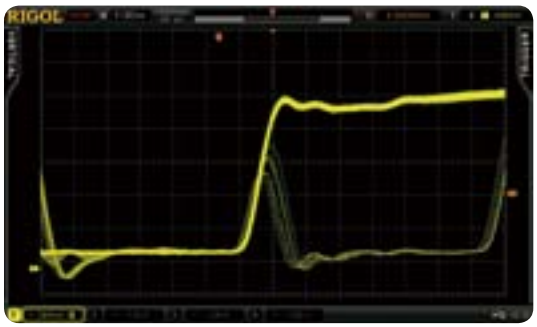
- Deeper Memory Depth(Std.140Mpts)
- Higher Waveform capture rate (Up to 180,000 wfms/s)
- Real Time waveform Record,Replay & Analysis (Up to 200,000 frames)
- Multi-level intensity grading display

► 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			

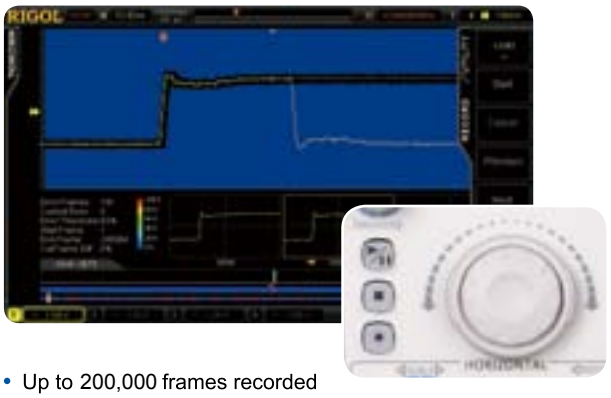
► Features and Benefits

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



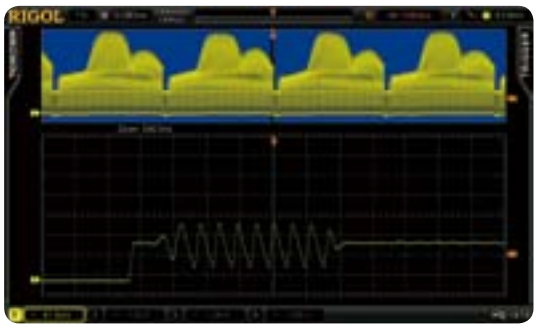
Find the infrequent problem easily

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



- Up to 200,000 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

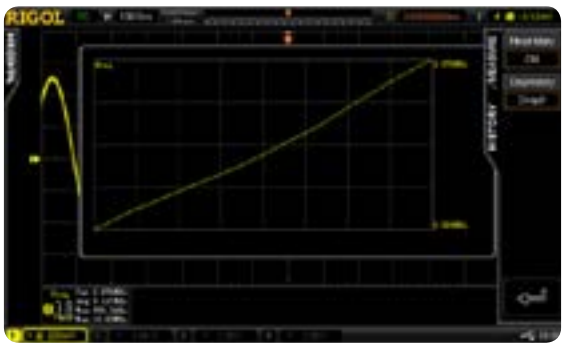
User defined Mask,Pass/Fail counts,Stop on Fail,Fail Alarm

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

Standard serial bus trigger functions(RS232, I2C,SPI,CAN,FlexRay,USB)

Measurement History: Show the trend of the parameters



Optional Serial bus Decording functions support Event Table display

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
RP5600A	10:1	DC~600 MHz	10 MΩ±2%	CAT II 300VAC	General purpose test
RP6150A	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±2% Single ended mode: 24 kΩ±2%	30V Peak, CAT I	Differential /Single ended high frequency signal test

RP2200 150MHz Passive Probe

RP3300 350MHz Passive Probe

RP6150A 1.5GHz Passive Probe

RP3500 500MHz Passive Probe

RP5600A 600MHz Passive Probe

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

RP7150 1.5GHz Active Probe

- Active probe support 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

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
Input Impedance	(1 MΩ±1%) || (14 pF±3 pF)
	or 50 Ω±1.5%
Probe Attenuation Coefficient	0.01X-1000X,1-2-5 step
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 1000 s/div
	DS610X: 500 ps/div to 1000 s/div
Time Base Accuracy	≤ ± 4 ppm
Time Base Drift	≤ ± 2 ppm/Year
Delay Range	Pre-trigger (negative delay): ≥1 screen width
	Post-trigger (positive delay): 1 s to 100,000 s
Timebase Mode	Y-T, X-Y, Roll, Time Delayed
Number of XYs	2 simultaneously (four channels model)
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 124 mV/div: ± 1.2V (50 Ω)	
	126 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)	
Calculated Rise Time[2]	DS606X: 600 ps	
	DS610X: 400 ps	
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
Line Frequency	broadcasting standards
Range	upport 480P,576P,720P,1080P and 1080I high definition standards
Pattern Trigger	
Pattern Setting	H, L, X, Rising Edge, Falling Edge
RS232/UART Trigger	
Trigger Condition	Start, Error, Check Error, Data
Polarity	Normal,Invert
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, 8 bit ,10 bit
Address Range	0 to 127, 0 to 255,0 to 1023
Byte Length	1 to 5
SPI Trigger	
Trigger Condition	CS, Timeout
Timeout Value	100ns to 1s
Data Bits	4 bit to 32 bit
Data Line Setting	H, L, X
Clock Edge	Rising Edge, Falling Edge

CAN Trigger	
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 Type	Bit Fail,Answer Error,Check Error,Format Error,Random Error
FlexRay Trigger	
Baud Rate	2.5Mb/s, 5Mb/s, 10Mb/s
Trigger Condition	Frame, Symbol, Error, TSS
USB Trigger	
Signal Speed	Low Speed, Full Speed
Trigger condition	SOP, EOP, RC, Suspended, ExitSuspend

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, Area, PeriodArea,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 are selectable)

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	dB,Vrms
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), CAN (option), FlexRay (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	USB DEVICE, two USB HOST ports, LAN, VGA Output, 10 MHz Input/Output, Aux output (TrigOut,Fast, GND, PassFail, Calibration)
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/50Hz/60Hz/400Hz	
	100-240 V/50 Hz/60Hz	
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	5.3 kg± 0.2 kg
	Package Included	10.8 kg± 1.0 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	

Note[1]:Maximum value. In single-channel mode, sine signal with 10 ns horizontal scale, 4 div input amplitude and 10 MHz frequency, edge trigger.
Note[2]:Typical.
Note[3]:Tilt tabs and handle folded, knob height included, front panel cover excluded.
Note[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	RP5600A
	1.5GHz BW Passive Probe,2 sets for DS6104,1 set for DS6102	RP6150A
	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)	RP5600A
	1.5GHz BW Passive Probe(Support all models)	RP6150A
	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/SPI Decording kit	SD-I2C/SPI-DS6
	CAN Decording kit	SD-CAN-DS6
	FlexRay Decording kit	SD-FlexRay-DS6

Warranty

Three-year warranty,excluding probes and accessories.

RIGOL

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July,2012