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**

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 200,000 frames for waveform record and replay

2. **Innovative UltraVision technology**
   - Deeper Memory Depth (Std. 140M pts)
   - Higher Waveform capture rate (Up to 180 wfms/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

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

---

**Recommended RIGOL probes**

<table>
<thead>
<tr>
<th>Model</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP5600</td>
<td>600MHz Passive Probe (Standard for all models, 4 sets for 4 channel models, 2 sets for 2 channel models)</td>
</tr>
<tr>
<td>RP6150</td>
<td>1.5GHz Passive Probe (Standard for 1GHz models: 2 sets for DS6104, 1 set for DS6102)</td>
</tr>
<tr>
<td>RP7150</td>
<td>1.5GHz Active Probe (Optional for all models)</td>
</tr>
<tr>
<td>RP3500</td>
<td>500MHz Passive Probe (Optional for all models)</td>
</tr>
</tbody>
</table>
Features and Benefits

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

- Find the infrequent problem easily

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

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
The probes supported by DS6000 series:

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Attenuation Ratio</th>
<th>Bandwidth</th>
<th>Input R</th>
<th>Max. Input Voltage</th>
<th>Recommended applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP2200</td>
<td>1:1 or 10:1</td>
<td>1X: DC<del>7 MHz, 10X: DC</del>150 MHz</td>
<td>1X: 1MΩ ±2%, 10X: 10 MΩ±2%</td>
<td>1X: CAT II 150 V AC, 10X: CAT II 300V AC</td>
<td>Small signal test (1X), General purpose test</td>
</tr>
<tr>
<td>RP3300</td>
<td>1:1 or 10:1</td>
<td>1X: DC<del>8 MHz, 10X: DC</del>350 MHz</td>
<td>1X: 1 MΩ ±2%, 10X: 10 MΩ±2%</td>
<td>1X: CAT II 150 V AC, 10X: CAT II 300V AC</td>
<td>Small signal test (1X), General purpose test</td>
</tr>
<tr>
<td>RP3500</td>
<td>10:1</td>
<td>DC~500 MHz</td>
<td>10 MΩ±2%</td>
<td>CAT II 300VAC</td>
<td>General purpose test</td>
</tr>
<tr>
<td>RP5600</td>
<td>10:1</td>
<td>DC~600 MHz</td>
<td>10 MΩ±2%</td>
<td>CAT II 300VAC</td>
<td>General purpose test</td>
</tr>
<tr>
<td>RP6150</td>
<td>10:1</td>
<td>DC~1.5 GHz</td>
<td>500 Ω±10 Ω</td>
<td>CAT I 10VAC</td>
<td>High frequency single ended signal test</td>
</tr>
<tr>
<td>RP1300H</td>
<td>100:1</td>
<td>DC~300 MHz</td>
<td>100 MΩ</td>
<td>CAT I 2000V (DC+AC), CAT II 1500 V (DC+AC)</td>
<td>High voltage test</td>
</tr>
<tr>
<td>RP1050H</td>
<td>1000:1</td>
<td>DC~50 MHz</td>
<td>10 MΩ±0.5%</td>
<td>DC: 0~15KV DC AC: pulse &lt;=30 KVp-p AC: sine wave &lt;=10 KVrms</td>
<td>High voltage test</td>
</tr>
<tr>
<td>RP7150</td>
<td>10:1</td>
<td>DC~1.5 GHz</td>
<td>Differential mode: 50 kΩ±2%, Single ended mode: 24 kΩ±2%</td>
<td>30V Peak, CAT I</td>
<td>Differential /Single ended high frequency signal test</td>
</tr>
</tbody>
</table>

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

Optional Serial bus Decoding functions support Event Table display

Measurement History: Show the trend of the parameters

Complete Connectivity

RP2200 150MHz Passive Probe

RP3300 350MHz Passive Probe
RP6150 1.5GHz Passive Probe

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

RP5600 600MHz Passive Probe

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

RP3500 500MHz Passive 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

RP7150 1.5GHz Active Probe

RP1300H 300MHz High Voltage Probe

RP1050H 50MHz High Voltage Probe
### Other accessories

<table>
<thead>
<tr>
<th>ARM option</th>
<th>Optional USB-GPIB adapter for remote control</th>
<th>Rack mount kit option</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Sample Mode</th>
<th>Real-time Sample, Equivalent Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Time</td>
<td>5 GSa/s (single-channel)</td>
</tr>
<tr>
<td>Sample Rate</td>
<td>2.5 Gsa/s (dual-channel)</td>
</tr>
<tr>
<td>Equivalent Sample Rate</td>
<td>100 Gsa/s</td>
</tr>
</tbody>
</table>

### Peak Detect

- 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.
- Resolution: 12 bits of resolution when ≥5 μs/div @ 5 GSa/s (or ≥10 μs/div @ 2.5 GSa/s).

### Input

- **Number of Channels**
  - DS6XX4: four channels
  - DS6XX2: two channels
- **Input Coupling**
  - DC, AC or GND (1 MΩ±1%) || (14 pF±3 pF)
  - or 50 Ω±1.5%
- **Input Impedance**
  - 0.01X-1000X, 1-2-5 step

### Maximum Input Voltage (1MΩ)

- **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
- **Time Base Accuracy**
  - ± 4 ppm/year
- **Time Base Drift**
  - Pre-trigger (negative delay): ≥1 screen width
  - Post-trigger (positive delay): 1 s to 1000 s
- **Delay Range**
  - Y-T, X-Y, Roll, Time Delayed
- **Timebase Mode**
  - 2 simultaneously (four channels model)
- **Number of XYs**
  - 150,000 wfms (vector display); 180,000 wfms (dots display)
- **Waveform Capture Rate**
  - 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
- **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)
  - 230 mV/div to 5 V/div: ± 40V (1MΩ)

### Bandwidth Limit²

- **Low Frequency Response (AC Coupling -3dB)**
  - 20 MHz or 250 MHz
- **Calculated Rise Time²**
  - ≤5 Hz (on BNC)

### 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 Rejection²**
  - 50 kHz
- **Low Frequency Rejection²**
  - 5 kHz
- **Edge Trigger**
  - 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
- **Line Frequency Range**: 480P, 576P, 720P, 1080P and 1080i high definition standards

## Pattern Trigger
- **Pattern Setting**: H, L, X, Rising Edge, Falling Edge

## RS232/UART Trigger
- **Triggers**: 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**: 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
- **SPI Trigger**: 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

## CAN Trigger
- **Signal Type**: Rx, Tx, CAN_H, CAN_L, Differential
- **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
- **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
- **Signal Speed**: Low Speed, Full Speed
- **Trigger condition**: SOF, EOF, RC, Suspended, ExitSuspend

## Math Operation
- **FFT 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 (DS6XX4 option), CAN (option), FlexRay (option)

## Frequency Counter
- **FFT Window Function**: Rect, Hanning, Blackman, Hamming
- **FFT Display**: Split, Full Screen
- **FFT Vertical Scale**: Linear RMS, dBV RMS
- **Math 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 (DS6XX4 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, Quick Edge, PassFail, Calibration, GND)
- **Printer Compatibility**: PictBridge

## General Specifications
- **Probe Compensation Output**: About 3 V, peak-peak
- **Frequency**: 1 kHz
- **Power**: 100-120 V/50Hz/60Hz/400Hz
- **Power Voltage**: 100-240 V/50Hz/60Hz/400Hz
- **Fuse**: 3 A, T Degree, 250 V

## Environment
- **Temperature Range**: 0°C to +50°C
- **Cooling Method**: Fan cooling
- **Humidity Range**: Under +35°C: ≤90% Relative Humidity
- **Altitude**: Operation: under 15,000 meters
- **Physical Characteristics**: 10.8 kg ± 1.0 kg
- **Size**: 399.0 mm × 255.3 mm × 123.8 mm
- **Weight**: 5.3 kg ± 0.2 kg
- **Calibration Interval**: About 1.0 kg

## Safety
- **Certification**: 2004/108/EC
- **Execution standard**: EN 61326-1:2006 EN 61326-2-1:2006

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS6104</td>
<td>DS6104 (1 GHz, 4-channel)</td>
<td>DS6104</td>
</tr>
<tr>
<td>DS6102</td>
<td>DS6102 (1 GHz, dual-channel)</td>
<td>DS6102</td>
</tr>
<tr>
<td>DS6064</td>
<td>DS6064 (600 MHz, 4-channel)</td>
<td>DS6064</td>
</tr>
<tr>
<td>DS6062</td>
<td>DS6062 (600 MHz, dual-channel)</td>
<td>DS6062</td>
</tr>
<tr>
<td>Standard Accessories</td>
<td>Power Cord conforming to the standard of the country</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Front Panel Cover</td>
<td>CB-USB-150</td>
</tr>
<tr>
<td></td>
<td>USB Data Cable</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>600MHz BW Passive Probe, 4 sets for 4 channel models, 2 sets for 2 channel models</td>
<td>RP5600</td>
</tr>
<tr>
<td></td>
<td>1.5GHz BW Passive Probe, 2 sets for DS6104, 1 set for DS6102</td>
<td>RP6150</td>
</tr>
<tr>
<td></td>
<td>Quick Guide</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Resource CD (User’s Guide and Application Software)</td>
<td>-</td>
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<tr>
<td>Optional Accessories</td>
<td>1.5GHz Active Differential Probe</td>
<td>RP7150</td>
</tr>
<tr>
<td></td>
<td>500MHz BW Passive Probes (Support all models)</td>
<td>RP3500</td>
</tr>
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<td>RP6150</td>
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<tr>
<td></td>
<td>USB to GPIB Module</td>
<td>USB-GPIB</td>
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<td></td>
<td>Desk Mount Instrument Arm</td>
<td>ARM</td>
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<tr>
<td></td>
<td>Rack Mount Kit</td>
<td>RM-DS-6</td>
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<tr>
<td>Decoding Options</td>
<td>RS232/UART Decoding kit</td>
<td>SD-RS232-DS6</td>
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<tr>
<td></td>
<td>I2C Decoding kit</td>
<td>SD-I2C-DS6</td>
</tr>
<tr>
<td></td>
<td>SPI Decoding kit</td>
<td>SD-SPI-DS6 (For DS6XX4)</td>
</tr>
<tr>
<td></td>
<td>CAN Decoding kit</td>
<td>SD-CAN-DS6</td>
</tr>
<tr>
<td></td>
<td>FlexRay Decoding kit</td>
<td>SD-FlexRay-DS6</td>
</tr>
</tbody>
</table>

November, 2011

For further information, please contact Rigol local Distributors