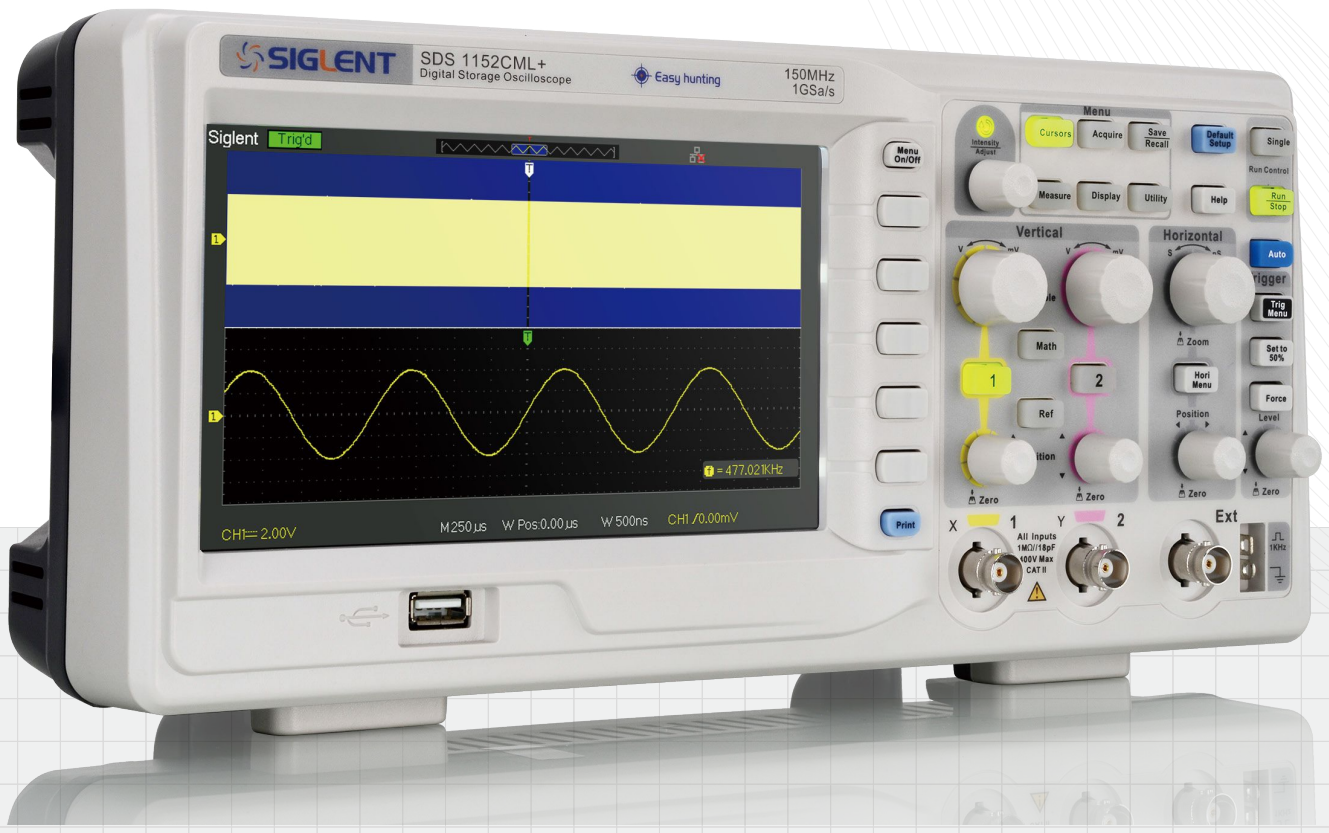


SDS1000DL+/CML+ Series Digital Oscilloscope



DataSheet-2016.5

SDS1052DL+













SDS1102CML+

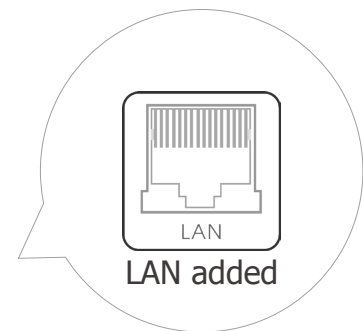
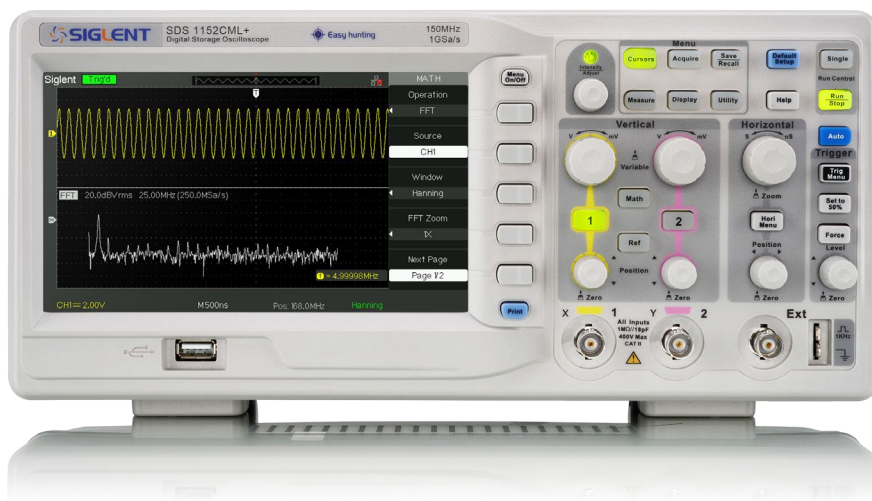
SDS1152CML+

Product overview

SDS1000DL+/CML+ series is a dual-channel universal digital oscilloscope, available in 50 MHz, 100 MHz and 150 MHz bandwidth models. It includes a 2 Mpts memory depth that helps to ensure accurate waveform resolution and to capture longer signal lengths. With its 7 inch TFT-LCD (800 * 480) screen, there is adequate screen space to help better see and analyze waveform details. Along with a 1 GSa/s sampling rate, the SDS1000CML+ supports 32 parameters measurements and common mathematical operations to speed up complex / repetitive measurements.

Key Features

-  150 MHz, 100 MHz, 50 MHz bandwidth models
-  Real-time sampling rate up to 1 GSa/s, Equivalent-time sampling rate up to 50 GSa/s
-  Memory Depth up to 2 Mpts
-  Trigger types: Edge, Pulse, Video, Slope, Alternate
-  Waveform math functions: +, -, *, /, FFT
-  6 digits frequency counter
-  Supports Multi-language display and embedded online help
-  Screensaver from 1 minute to 5 hours
-  Digital filter and waveform recorder function
-  Shortcut storage function key
-  7 inch TFT-LCD display with 800 * 480 resolution
-  Multiple interfaces: USB Host, USB Device (USBTMC), LAN (VXI-11), Pass / Fail

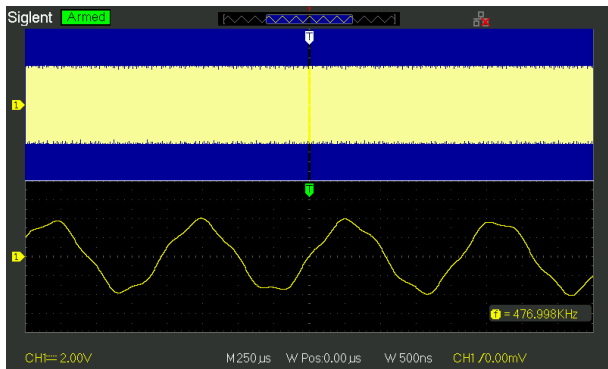


Models and Key Specifications

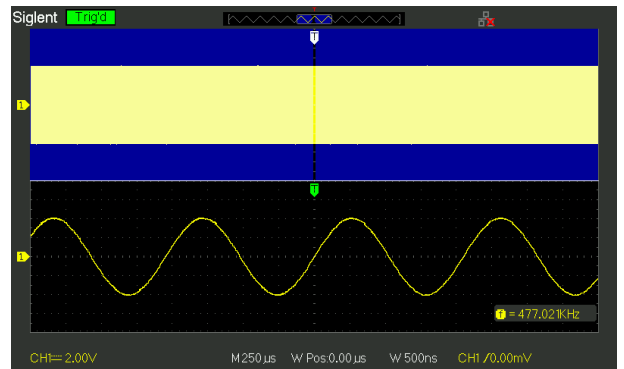
| Model | SDS1052DL+ | SDS1102CML+ | SDS1152CML+ |
|----------------------|--------------------------------------|----------------------------|----------------------------|
| Bandwidth | 50 MHz | 100 MHz | 150 MHz |
| Sampling Rate (Max.) | 500 MSa/s | 1 GSa/s | |
| Channels | 2+EXT | | |
| Memory Depth (Max.) | 32 Kpts | 2 Mpts | |
| Trigger Types | Edge, Pulse, Video, Slope, Alternate | | |
| I/O | USB Host, USB Device, LAN, Pass/Fail | | |
| Probe (Std) | 2 pcs passive probe, PB470 | 2 pcs passive probe, PP510 | 2 pcs passive probe, PP215 |
| Display | 7 inch TFT LCD (800x480) | | |
| Net Weight | 2.5 Kg | | |

Function & Characteristic

Memory Depth up to 2 Mpts



Normal Memory (40 Kpts)



Long Memory (2 Mpts)

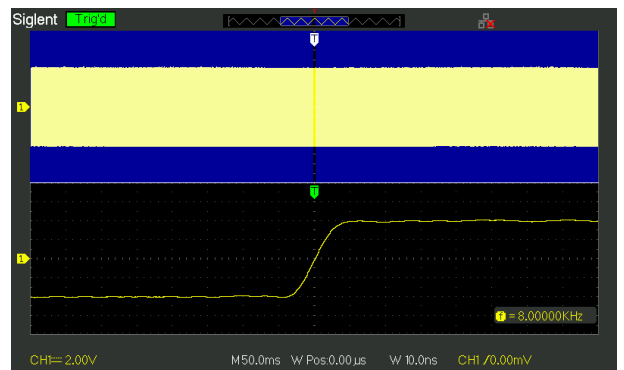
Using the long memory mode, users are able to use a higher sampling rate to capture more of the signal, and quickly zoom to focus on the area of interest.

32 parameters auto measurements and 5 parameters display



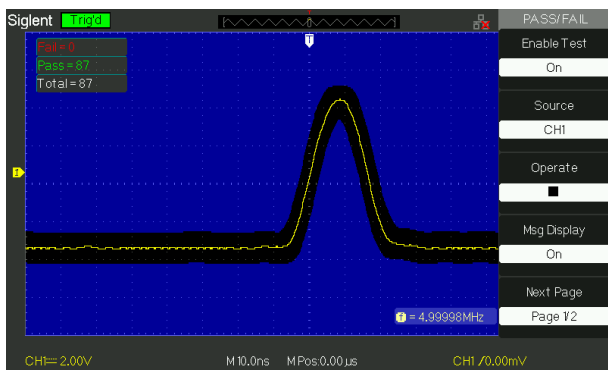
The SDS1000DL+/CML+ support voltage, time and delay measurement types, with a total of 32 different parameters. The user is able to select five measurements to display on the screen. All measurement parameters can also be displayed simultaneously.

Zoom Function



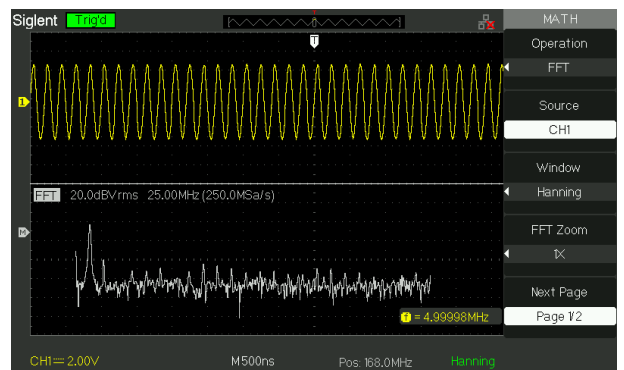
Zoom can extend a partial segment of the waveform, giving the user not only an overview of the whole signal but also a detailed view of the zoomed-in segment. The Zoom feature is a convenient way to locate a specific segment of a signal while zooming in to see the details.

Pass/Fail Function



With easy to generate user-defined test templates, the SDS1000DL+/CML+ compares the current measured trace to the template mask trace making it suitable for long-term signal monitoring or automated production line testing.

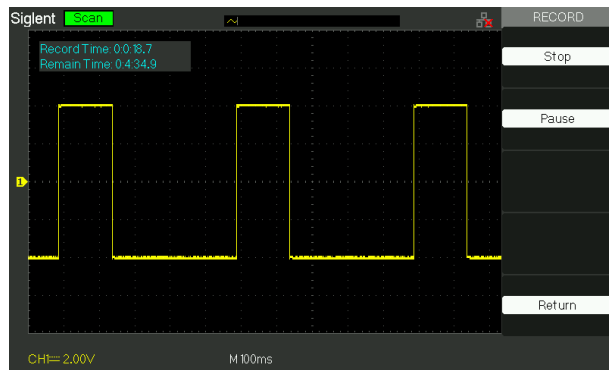
Math Function



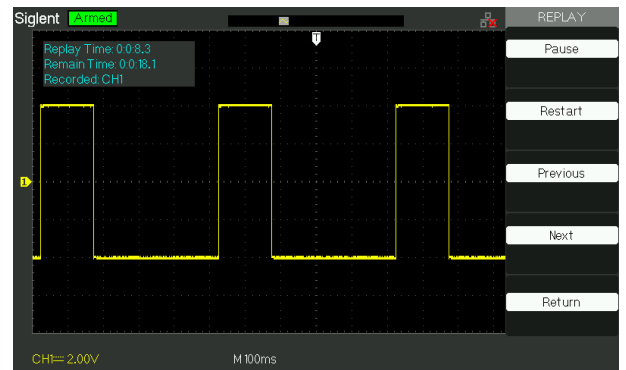
SDS1000DL+/CML+ provides 5 kinds of math operation: +, -, *, /, FFT, supporting channel waveform and FFT waveform in either split display windows or both signals appearing on the full screen.

Characteristics

Digital Recorder

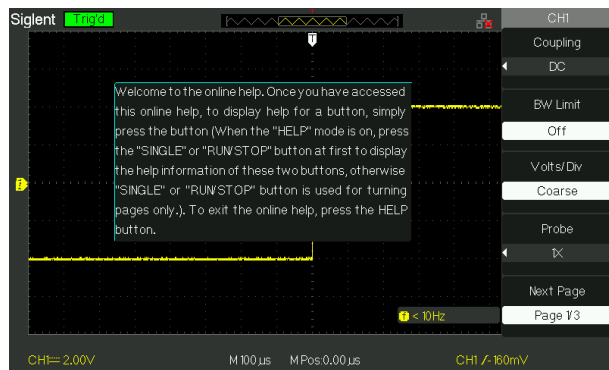


The digital recorder is able to record data in real-time and without any dead time. SDS1000DL+/CML+ supply 7 M of memory for the recorder and support a USB disk.



Replaying the data for user to observe and analyze.

Embedded Online Help



Supports Multi-language display and embedded online help, familiarizes the user with all the functions of in a short time.

Abundant interfaces



SDS1000DL+/CML+ support USB Host, USB Device (USBTMC), LAN (VXI-11), Pass / Fail.

Specifications

| Acquire System | |
|-------------------------|---|
| Real-time Sampling Rate | SDS1052DL+ : 500 MSa/s SDS1102CML+/SDS1152CML+ : 1 GSa/s |
| Memory Depth | SDS1052DL+ : 32 Kpts SDS1102CML+/SDS1152CML+ : 40 Kpts (Normal Mode) ; 2 Mpts (Long Memory Mode) |
| Acquire Mode | Normal, Peak Detect, Average |
| Average | Averages: 4, 16, 32, 64, 128, 256 |
| Waveform interpolation | Sinx,X |
| Input | |
| Channel | 2 |
| Coupling | DC, AC, GND |
| Impedance | DC: (1 MΩ±2%) {(18 pF ±3 pF) 50 Ω: 50 Ω±2% |
| Max. Input voltage | 400 V , 1 MΩ |
| Channel Isolation | > 100:1 |
| Probe attenuator | 1 X, 10 X, 50 X, 100 X, 500 X , 1000 X |

Horizontal System

| | |
|-------------------|--|
| Timebase Scale | 150 MHz 2.5 ns/div - 50 s/div 100 MHz 2.5 ns/div - 50 s/div 50 MHz 5.0 ns/div - 50 s/div |
| Channel Skew | <500 ps |
| Display Format | Y-T, X-Y, Scan |
| Timebase Accuracy | ±50 ppm |
| Scan Mode | 100 ms/div ~ 50 s/div |

Vertical System

| | |
|----------------------------------|---|
| Bandwidth (-3 dB) | 150 MHz (SDS1152 CML+) 100 MHz (SDS1102 CML+) 50 MHz (SDS1052 DL+) |
| Vertical Resolution | 8 bit |
| Vertical Scale (Probe 1 X) | 2 mV/div - 10 V/div (1-2-5) |
| Offset Range (Probe 1 X) | 2 mV - 200 mV: ± 1.6 V; 206 mV ~ 10 V: ± 40 V |
| Bandwidth Limit | 20 MHz ±40% |
| Bandwidth Flatness | DC - 10%(BW): ± 1 dB 10% - 50%(BW): ± 2 dB 50% - 100%(BW): + 2 dB/-3 dB |
| Low Frequency Response (AC-3 dB) | ≤10 Hz (at input BNC) |
| Noise | STDEV≤0.6 div (≥ 5 mV/div) STDEV≤0.7 div (2 mV/div) |
| DC Gain Accuracy | ≤ ±3.0%: 5 mV/div ~10 V/div ≤±4.0%: ≤2 mV/div |
| DC Measurement Accuracy | ± [3%× (reading + offset) +1%× offset +0.2 div+2 mV] , ≤100 mV/div ±[3%× (reading + offset) +1%× offset +0.2 div+100 mV] , >100 mV/div |
| Rise time | Typical 2.3 ns (SDS1152 CML+) Typical 3.5 ns (SDS1102 CML+) Typical 7.0 ns (SDS1052 DL+) |
| Overshoot (500 ps Pulse) | <10% |

Trigger System

| | |
|----------------------|--|
| Trigger Mode | Auto, Normal, Single |
| Trigger Level Range | Internal: ±6 divisions from center of screen EXT: ±1.2 V EXT/5: ±6 V |
| Hold off Range | 100 ns ~ 1.5 s |
| Trigger Coupling | AC, DC, LF Rej, HF Rej |
| Trigger Sensitivity | 1 Divisions: DC-10 MHz 1.5 Divisions: 10 MHz - Max BW |
| Trigger Displacement | Pre-trigger: Memory depth/ (2*sampling) Delay Trigger: 260 div |

Edge Trigger

| | |
|--------|-----------------------------------|
| Slope | Rising, Falling, Rising & Falling |
| Source | CH1/CH2/EXT/(EXT/5)/AC Line |

Slope Trigger

| | |
|-------------|-----------------|
| Slope | Rising, Falling |
| Limit Range | <, >, = |
| Source | CH1/CH2 |
| Time Range | 20 ns ~ 10 s |

Pulse Trigger

| | |
|-------------|--------------|
| Polarity | +wid , -wid |
| Limit Range | <, >, = |
| Source | CH1/CH2 |
| Pulse Range | 20 ns - 10 s |

Video Trigger

| | |
|-------------------|--|
| Signal Standard | NTSC, PAL/Secam |
| Source | CH1/CH2 |
| Trigger condition | odd field, even field, all lines, line num |

| Measure System | | |
|--|--|---|
| Source | CH1, CH2 | |
| Measurement Parameters (32 Types) | | |
| Vertical (Voltage) | Vmax | Highest value in input waveform |
| | Vmin | Lowest value in input waveform |
| | Vpp | Difference between maximum and minimum data values |
| | Vamp | Difference between top and base in a bimodal signal ,or between max and min in an unimodal signal |
| | Vtop | Value of most probable higher state in a bimodal waveform |
| | Vbase | Value of most probable lower state in a bimodal waveform |
| | Mean | Average of all data values |
| | Vmean | Average of data values in the first cycle (Condition: there is an entire period) |
| | Vrms | Root mean square of all data values |
| | Crms | Root mean square of all data values in the first cycle (Condition: there is an entire period) |
| | FOV | Overshoot after a falling edge; (base-min)/Amplitude |
| | FPRE | Overshoot before a falling edge; (max-top)/Amplitude |
| | ROV | Overshoot after a rising edge;(max-top)/Amplitude |
| RPRE | Overshoot before a rising edge; (base-min)/Amplitude | |
| Horizontal (Time) | Period | Period for every cycle in waveform at the 50% level ,and positive slope |
| | Freq | Frequency for every cycle in waveform at the 50% level, and positive slope |
| | +Wid | Width measured at 50% level and positive slope |
| | -Wid | Width measured at 50% level and negative slope |
| | Rise Time | Duration of rising edge from 10-90% |
| | Fall Time | Duration of falling edge from 90-10% |
| | Bwid | Time from the first rising edge to the last falling edge, or the first falling edge to the last rising edge at the 50% crossing |
| | +Dut | Ratio of positive width to period |
| | -Dut | Ratio of negative width to period |
| Delay | Phase | Calculates the phase difference between two edges (Condition: there is an entire period) |
| | FRR | Time between the first rising edges of the two channels |
| | FRF | Time from the first rising edge of channel A ,to the first falling edge of channel B |
| | FFR | Time from the first falling edge of channel A ,to the first rising edge of channel B |
| | FFF | Time from the first falling edge of channel A ,to the first falling edge of channel B |
| | LRR | Time from the first rising edge of channel A ,to the last rising edge of channel B (Condition: there is an entire period) |
| | LRF | Time from the first rising edge of channel A, to the last falling edge of channel B (Condition: there is an entire period) |
| | LFR | Time from the first falling edge of channel A, to the last rising edge of channel B (Condition: there is an entire period) |
| LFF | Time from the first falling edge of channel A, to the last falling edge of channel B | |
| Cursors | Manual mode, Track mode and Auto mode | |
| Counter | Hardware Counter (Resolution 1 Hz) | |

Math Function

| | |
|-------------|---|
| Operation | + , - , * , / , FFT |
| FFT | Rectangular, Blackman, Hanning, Hamming |
| FFT display | Full Screen, Split |

Save/Recall

| | |
|------|---|
| Type | Setting, Waveform, Bmp, CSV 2 refs, 20 settings, 10 waveforms internal Save to USB disk |
|------|---|

I/O

| | |
|--------------|--------------------------------------|
| Standard I/O | USB Host, USB Device, LAN, Pass/Fail |
| Pass/Fail | 3.3 V TTL Output |

Display (Screen)

| | |
|--------------------|--|
| Display Type | 7 inch TFT-LCD |
| Display Resolution | 800×480 |
| Display Color | 24 bit |
| Contrast (Typical) | 500:1 |
| Backlight | 300 nit |
| Wave display range | 8 x 16 div |
| Wave Display Mode | Dots, Vectors |
| Persist | Off, 1 s, 2 s, 5 s, Infinite |
| Menu Display | 2 sec, 5 sec, 10 sec, 20 sec, Infinite |
| Screen-Saver | Off, 1 min, 2 min, 5 min, 10 min, 15 min, 30 min, 1 hour, 2 hour, 5 hour |
| Color mode | Normal , Invert |
| Language | English, Simplified Chinese, Traditional Chinese, Arabic, French, German, Russian, Portuguese Spanish, Japanese, Korean, Italian |

Environments

| | |
|-------------|--|
| Temperature | Operating: 10 °C ~ +40 °C Non-operating: -20 °C ~ +60 °C |
| Humidity | Operating: 85% RH, 40 °C , 24 Hours Non-operating: 85% RH, 65 °C , 24 Hours |
| Height | Operating: ≤3000 m Non-operating: ≤15,266 m |













Power Supply







| | |
|-------|--|
| Input | 100 ~ 240 Vrms 50/60 Hz 100 ~ 120 Vrms 400 Hz |
| Power | 50 W Max |

Mechanical

| | |
|------------|--|
| Dimensions | Length 323.1 mm Width 135.6 mm Height 157 mm |
| Weight | N.W: 2.5 Kg |

SDS1000DL+/CML+ Probes & Accessories

| Type | Model | Picture | Specifications |
|---------------------------------|----------|---|--|
| Passive Probe | PB470 |  | 70 MHz Bandwidth 1 X/10 X, 1 M/10 Mohm, 300 V/600 V |
| | PP510 | | 100 MHz Bandwidth 1 X/10X, 1 M/10 Mohm, 300 V/600 V |
| | PP215 | | 200 MHz Bandwidth 1 X/10X, 1 M/10 Mohm, 300 V/600 V |
| Current Probe | CP4020 |  | Bandwidth: 100 KHz, Max. continuous current: 20 Arms, Peak current: 60 A Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: 50 mV/A (0.4A-10ApK)±2%, 5 mV/A (1A-60ApK) ±2%, 9 V battery source |
| | CP4050 |  | Bandwidth: 1 MHz; Maximum continuous current 50 Arms; Peak current 140 A; Switching ratio: 500 mV/A; 50 mV/A; DC measurement accuracy: 500 mV/A (20 mA-14 ApK) ±3%±20 mA; 50 mV/A (200 mA-100 ApK) ±4%± 200 mA; 50 mV/A (100 A-140 ApK)±15% max; 9 V battery-powered |
| | CP4070 |  | Bandwidth: 150 KHz; Maximum continuous current 70 Arms; Peak current 200 A; Switching ratio: 50 mV/A; 5 mV/A; DC measurement accuracy: 50 mV/A (0.4 A-10 ApK) ±2%, ±5 mV/A (1 A-200 ApK)±2%; 9 V battery-powered |
| | CP4070A |  | Bandwidth: 300 KHz; Maximum continuous current 70 Arms; Peak current 200 A; Switching ratio: 100 mV/A; 10 mV/A; DC measurement accuracy: 100 mV/A (50 mA-10 ApK) ±3%±50 mA; 10 mV/A (500 mA-40 ApK) ±4%±50 mA; 10 mV/A (40 A-200 ApK) ±15% max; 9 V battery-powered |
| | CP5030 |  | Bandwidth: 50 MHz; Maximum continuous current 30 Arms; Peak current 50 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 1 A (±1%±1 mA); 100 mV/A (±1%±10 mA); Standard DC12 V/1.2 A power adapter |
| | CP5030A |  | Bandwidth: 100 MHz; Maximum continuous current 30 Arms; Peak current 50 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 1 A (±1%±1 mA); 100 mV/A (±1%±10 mA); Standard DC12 V/1.2 A power adapter |
| | CP5150 |  | Bandwidth: 12 MHz; Maximum continuous current 150 Arms; Peak current 300 A; Switching ratio: 100 mV/A, 1 V/A; AC/DC measurement accuracy: 100 mV/A (±1%±1 mA); 10 mV/A (±1%±10 mA); Standard DC12 V/1.2 A power adapter |
| | CP5500 |  | Bandwidth: 5 MHz; Maximum continuous current 500 Arms; Peak current 750 A; Switching ratio: 100 mV/A, 10 mV/A; AC/DC measurement accuracy: 100 mV/A (±1%±1 mA); 10 mV/A (±1%±10 mA); Standard DC12 V/1.2 A power adapter |
| High Voltage Differential Probe | DPB4080 |  | Bandwidth: 50 MHz; Maximum input differential voltage 800 V (DC + Peak AC); Range selection (attenuation ratio): 10 X/100 X; Accuracy: ±1%; Standard DC 9 V/1 A power adapter |
| | DPB5150 |  | Bandwidth: 70 MHz; Maximum input differential voltage 1500 V (DC + Peak AC); Range selection (attenuation ratio): 50 X/500 X; Accuracy: ±2%; Standard 5 V/1 A USB power adapter |
| | DPB5150A |  | Bandwidth: 100 MHz; Maximum input differential voltage 1500 V (DC + Peak AC); Range selection (attenuation ratio): 50 X/500 X; Accuracy: ±2%; Standard 5 V/1 A USB power adapter |

| Type | Model | Picture | Specifications |
|--|----------------|--|---|
| High Voltage Differential Probe | DPB5700 |  | Bandwidth: 70 MHz; Maximum input differential voltage 7000 V (DC + Peak AC); Range selection (attenuation ratio): 100 X/1000 X; Accuracy: ±2%; Standard 5 V/1 A USB power adapter |
| | DPB5700A |  | Bandwidth: 100 MHz; Maximum input differential voltage 7000 V (DC + Peak AC); Range selection (attenuation ratio): 100 X/1000 X; Accuracy: ±2%; Standard 5 V/1 A USB power adapter |
| High Voltage Probe | HPB4010 |  | Bandwidth: 40 MHz; Maximum measurement voltage DC: 10 KV; AC (rms) : 7 KV (sine) ;AC (Vpp) :20 KV (Pulse); attenuation ratio1:1000; Accuracy: ≤3% |
| Isolated front end | ISFE |  | USB 5 V power supply, plug and play, the maximum input voltage 600 Vp-p, floating test. Work with oscilloscopes. |
| GPIB | USB-GPIB |  | USB-GPIB Adapter, USB Device expanded into GPIB interface. |
| Demo board | STB Test Board |  | Optional accessories For experimental teaching and product demos |

Ordering information

| Description | Model |
|--|---|
| 50 MHz, 2 CH, 500 MSa/s (Max.) , 32 Kpts, 7 inch (800*480) LCD | SDS1052DL+ |
| 100 MHz, 2 CH, 1 GSa/s (Max.) , 2 Mpts, 7 inch (800*480) LCD | SDS1102CML+ |
| 150 MHz, 2 CH, 1 GSa/s (Max.) , 2 Mpts, 7 inch (800*480) LCD | SDS1152CML+ |
| Standard Accessories | |
| USB Cable -1 | |
| Quick Start -1 | |
| Certificate of Calibration -1 | |
| Passive Probe -2 | |
| Quality Certificate -1 | |
| Power Cord -1 | |
| CD (Included User Manual and EasyScopeX software) -1 | |
| Optional Accessories | |
| Isolated Front End | ISFE |
| STB Demo board | STB |
| High Voltage Probe | HPB4010 |
| Current Probe | CP4020/CP4050/CP4070/CP4070A/CP5030/CP5030A/ CP5150/CP5500 |
| Differential Probe | DPB4080/DPB5150/DPB5150A/DPB5700/DPB5700A |

SDS1000DL+/CML+ Series Digital Oscilloscope



About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, isolated handheld oscilloscopes and other general purpose test instrumentation. Since its first oscilloscope, the ADS7000 series, was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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