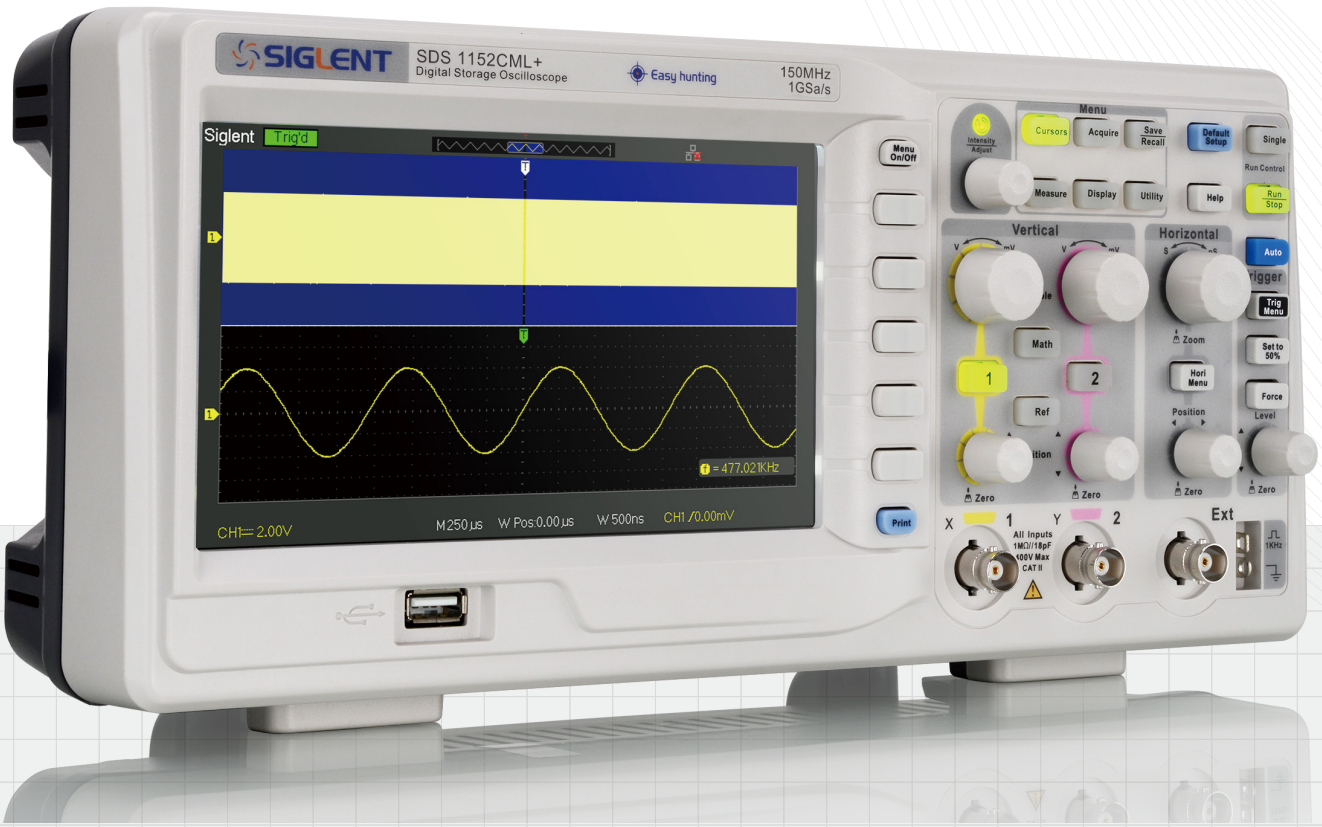
SDS1000DL+/CML+ Series Digital Oscilloscope

SIGLENT®

DataSheet-2016.3



SIGLENT TECHNOLOGIES CO.,LTD

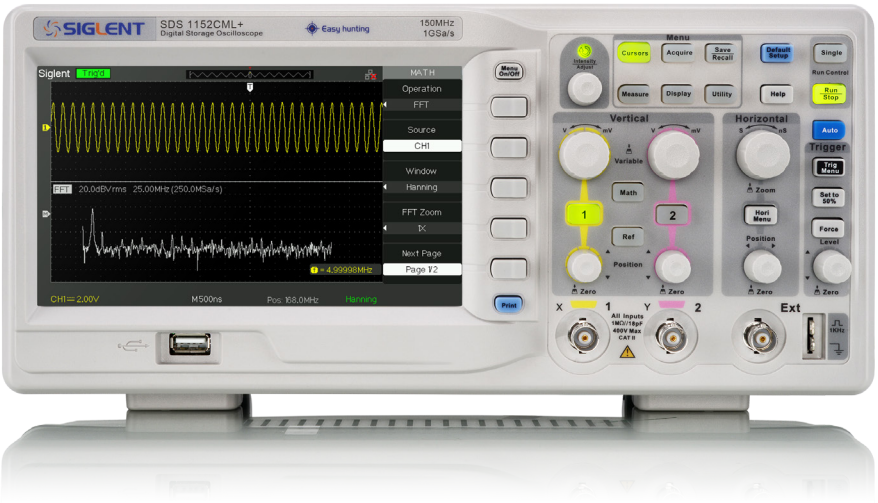
SDS1052DL+
SDS1072CML+
SDS1102CML+
SDS1152CML+

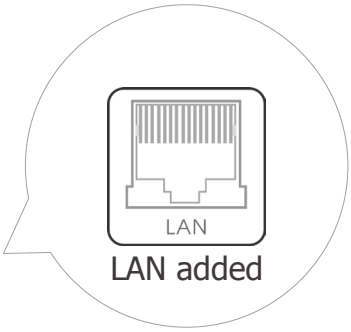
Product overview

SDS1000DL+/CML+ series is a dual-channel universal digital oscilloscope, available in 50 MHz, 70 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, 70 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 digital 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



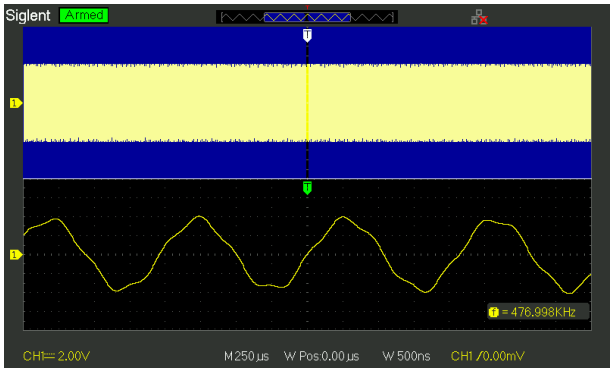


Models and Key Specifications

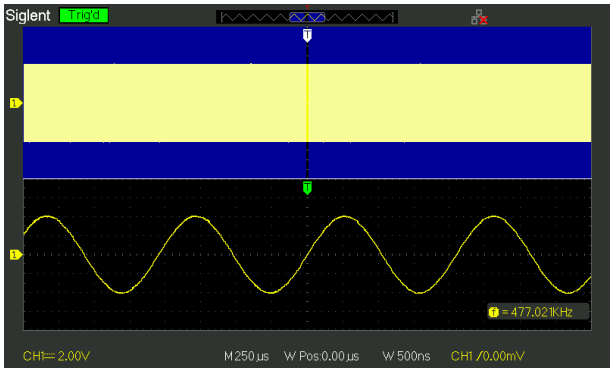
Model	SDS1052DL+	SDS1072CML+	SDS1102CML+	SDS1152CML+
Bandwidth	50 MHz	70 MHz	100 MHz	150 MHz
Sampling Rate (Max.)	500 MSa/s	1 GSa/s		
Channels	2+EXT			
Memory Depth (Max.)	32 Kpts	2 Mpts		
Trigger Types	Edge, Pulse, Video, Slope, Alternate			
I/O	USB Host, USB Device, LAN, Pass/Fail			
Probe (Std)	2 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



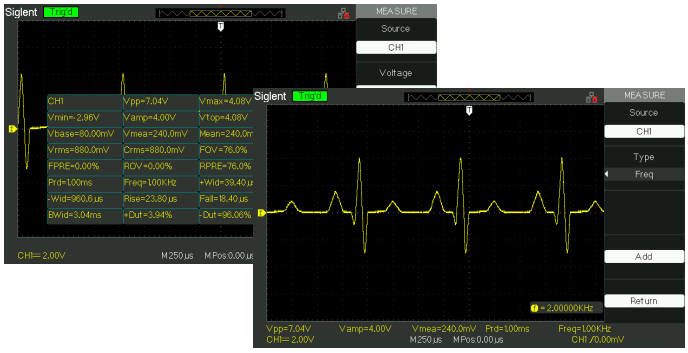
Normal Memory (40 Kpts)



Long Memory (2 Mpts)

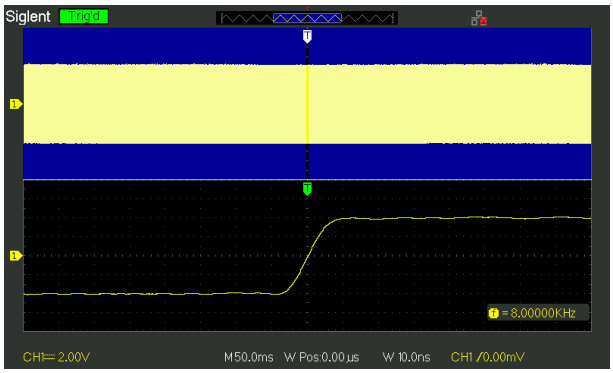
Using the long memory mode, users are able to use a higher sampling rate to capture more of the signal, and quickly zoom to focus on the area of interest.

32 parameters auto measurements and 5 parameters display



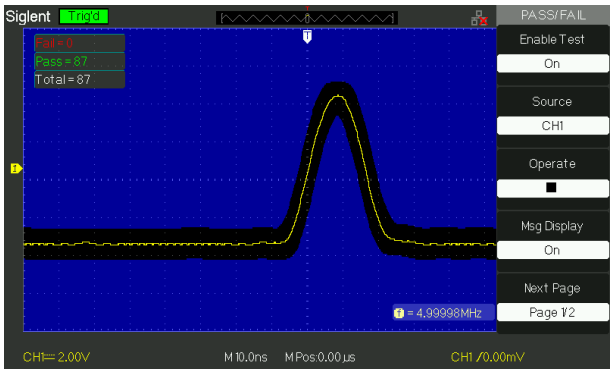
The SDS1000DL+/CML+ support voltage, time and delay measurement types, with a total of 32 different parameters. The user is able to select five measurements to display on the screen. All measurement parameters can also be displayed simultaneously.

Zoom Function



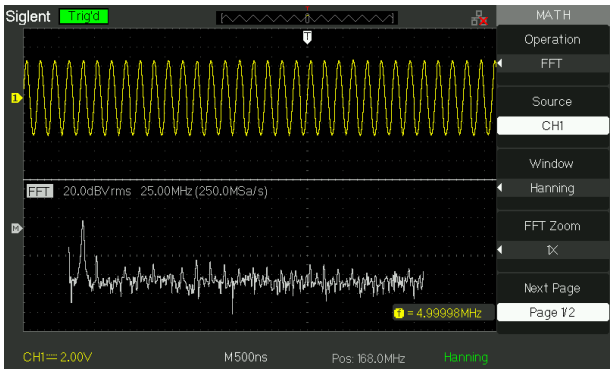
Zoom can extend a partial segment of the waveform, giving the user not only an overview of the whole signal but also a detailed view of the zoomed-in segment. The Zoom feature is a convenient way to locate a specific segment of a signal while zooming in to see the details.

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.

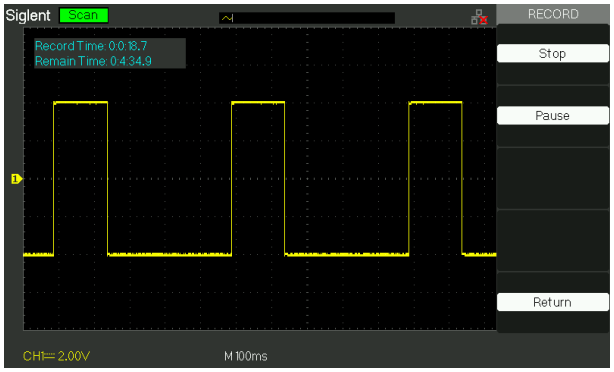
Math Function



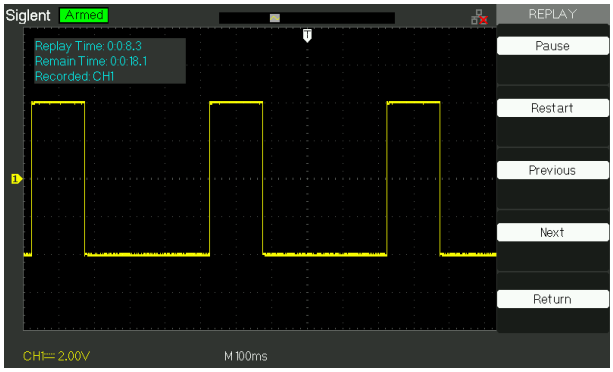
SDS1000DL+/CML+ provides 5 kinds of math operation: +, -, *, /, FFT, supporting channel waveform and FFT waveform in either split display windows or both signals appearing on the full screen.

Characteristics

Digital Recorder

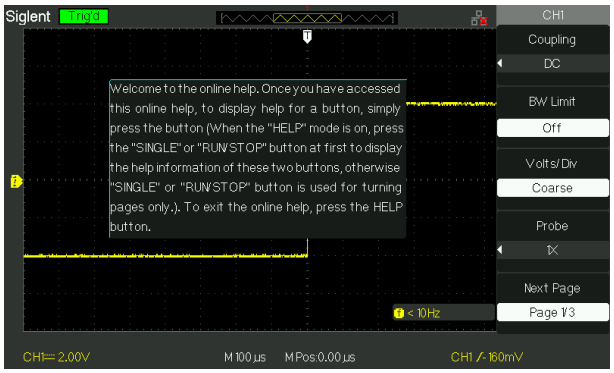


The digital recorder is able to record data in real-time and without any dead time. SDS1000DL+/CML+ supply 7 M of memory for the recorder and support a USB disk.



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 SDS1072CML+/SDS1102CML+/SDS1152CML+ : 1 GSa/s
Memory Depth	SDS1052DL+ : 32 Kpts SDS1072CML+/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 70 MHz 5.0 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+) 70 MHz (SDS1072 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 5.0 ns (SDS1072 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 ℃ ~ +40 ℃ Non-operating: -20 ℃ ~ +60 ℃
Humidity	Operating: 85% RH, 40 ℃ , 24 Hours Non-operating: 85% RH, 65 ℃ , 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 current750 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+
70 MHz, 2 CH, 1 GSa/s (Max.) , 2 Mpts, 7 inch (800*480) LCD	SDS1072CML+
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
USB-GPIB Adapter	USB-GPIB Adapter
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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