SDS6000L
Low Profile Digital Storage Oscilloscope

SIGLENT®

Data Sheet

EN01C

SIGLENT TECHNOLOGIES CO., LTD.

SDS6208L / SDS6204L
SDS6108L / SDS6104L
SDS6058L / SDS6054L

Product Overview

SIGLENT's SDS6000L series Low Profile Digital Storage Oscilloscopes provide up to 8 analog channels + 16 digital channels in a space-saving chassis size. This series is available in bandwidths of 2 GHz / 1 GHz / 500 MHz, feature a maximum sample rate of 5 GSa/s (10 GSa/s ESR) for each channel, and a maximum record length of 500 Mpts/ch.

The SDS6000L series employs Siglent's SPO technology with a maximum waveform capture rate of up to 170,000 wfm/ s (normal mode, up to 750,000 wfm/s in Sequence mode), 256-level intensity grading display function plus a color temperature display mode. It also employs an innovative digital trigger system with high sensitivity and low jitter. The trigger system supports multiple powerful triggering modes including serial bus triggering. Tools such as History waveform recording, Search and Navigate functions, Mask Test, Power Analysis and Eye/ Jitter Analysis allow for extended waveform records to be captured, stored, and analyzed. An impressive array of measurement and math capabilities, options for a 25 MHz arbitrary waveform generator, and serial decoding are also features of the SDS6000L.

It can be used as a stand-alone oscilloscope by being connected to an external display and a mouse. It can also be remotely controlled over LAN thanks to the convenient built-in web server. Combined with a 64-channel synchronization distributor (SYN64), multiple SDS6000L modules can be organized as a high-speed acquisition system with up to 512 channels. A complete SCPI command set over the standard 1000M LAN connection provides very fast data acquisition to speed automated test applications.

Key Features

- 8/4 analog channels + 1 external trigger. Designed for expansion. Combine multiple units for a high-speed acquisition system with up to 512 channels.
- Up to 2 GHz bandwidth with 5 GSa/s (10 GSa/s ESR) sample rate at each channel
- Low background noise, supports 0.5 mV/div to 10 V/div vertical scales
- SPO technology
- Waveform capture rates up to 170,000 wfm/s (normal mode), and 750,000 wfm/s (sequence mode)
- Supports 256-level intensity grading and color temperature display modes
- 500 Mpts Record length in total for all 4 channels
- Digital trigger system
- Intelligent trigger: Edge, Slope, Pulse, Window, Runt, Interval, Dropout, Pattern, Qualified, Nth edge, Setup / hold, Delay and Video (HDTV supported). Zone Trigger simplifies advanced triggering
- Serial bus triggering and decoder, supports protocols I^2C, SPI, UART, CAN, LIN, CAN FD, CAN XL, FlexRay, I^2S, MIL-STD-1553B, SENT, ARINC429,   Manchester etc.
- Segmented acquisition (Sequence) mode, dividing the maximum record length into multiple segments (up to 80,000), according to trigger conditions set by the user, with a very small dead time between segments to capture the qualifying event
- History waveform record (History) function, the maximum recorded waveform length is 80,000 frames
- Automatic measurements on 50+ parameters, supports statistics with histogram, track, trend, Gating measurement, and measurements on Math, History, Memory and Ref
- 8 Math traces (8 Mpts FFT, addition, subtraction, multiplication, division, integration, differential, square root, etc.), supports formula editor
- Abundant data analysis functions such as Search, Navigate, Digital Voltmeter, Counter, Waveform Histogram, Power Analysis and Eye/Jitter Analysis
- 16 digital channels
- 25 MHz function / arbitrary waveform generator, built-in multiple predefined waveforms
- Interfaces include: 4x USB Hosts, USB Device (USBTMC), 1000M LAN（VXI-11/ Telnet/ Socket）, micro SD card, Pass/Fail, Trigger Out, HDMI, 10MHz In, 10MHz Out
- Built-in web server supports remote control over the LAN port using a web browser. Supports SCPI remote control commands. Supports external mouse and keyboard.

Models and Key Specifications

Model / Channel	2 GHz	1 GHz	500 MHz
8	SDS6208L	SDS6108L	SDS6058L
4	SDS6204L	SDS6104L	SDS6054L

Model	SDS6208L SDS6204L	SDS6108L SDS6104L	SDS6058L SDS6054L
Channel	8/4 + EXT		
Bandwidth	2 GHz	1 GHz	500 MHz
Sample rate (Max.)	5 GSa/s (10 GSa/s ESR) @ each channel		
Memory depth (Max.)	500 Mpts/ch (single-channel) 250 Mpts/ch (dual-channel) 125 Mpts/ch (3 or 4 channels)		
Waveform capture rate (Max.)	Normal mode: 170,000 wfm/s; Sequence mode: 750,000 wfm/s		
Vertical resolution	8-bit Up to 12-bit in ERES mode, equivalent to 16-bit Hi-Res mode		
Trigger type	Edge, Slope, Pulse width, Window, Runt, Interval, Dropout, Pattern, Video, Qualified, Nth edge, Setup/hold, Delay, Serial		
Serial trigger and decode	Standard: I2C, SPI, UART, CAN, LIN Optional: CAN FD, CAN XL (decode only), FlexRay, I2S, MIL-STD-1553B, SENT, Manchester (decode only), ARINC429 (decode only), SpaceWire (decode only), USB2.0 (decode only)		
Measurement	50+ parameters, statistics, histogram, trend, and tracking supported		
Math	8 traces 8 Mpts FFT(magnitude and phase), +, -, x, ÷, ∫dt, d/dt, √ , Identity, Negation, Absolute, Sign, ex, 10x, ln, lg, Interpolation, MaxHold, MinHold, ERES, Average, tan, atan, envelope, filter. Supports formula editor		
Data analysis	Search, Navigate, History, Mask Test, Digital Voltmeter, Counter, Waveform Histogram, Power Analysis, Eye / Jitter Analysis, SignalScan		
Digital channel	16-channel; maximum sample rate up to 1 GSa/s; record length up to 50 Mpts		
Waveform generator (optional)	Built-in single-channel waveform generator, frequency up to 25 MHz, 125 MSa/s sample rate, 16 kpts waveform memory		
I/O	HDMI (1280*800), USB 3.0 Host x2, USB 2.0 Host x2, USB 2.0 Device (USBTMC), 1000M LAN (SCPI over VXI-11, SCPI over Telnet (port:5024), SCPI over Socket (port:5025), micro SD card, External trigger, Auxiliary output (TRIG OUT,PASS / FAIL), 10 MHz In, 10 MHz Out		
Probe (Standard)	1x 500 MHz passive probe supplied for each channel		

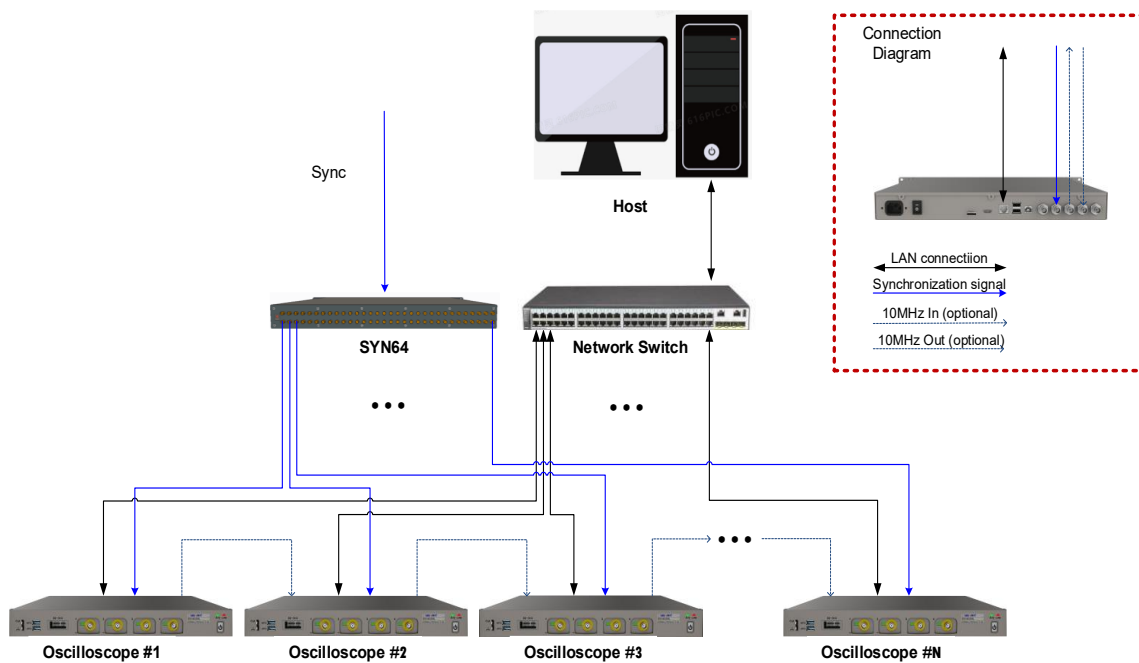| Multiple-channel Acquisition System	
Channel	Up to 512
Jitter	Within a unit: < 100 ps,rms Between units:< 250 ps,rms
Skew	Without skew calibration, within a unit: < 100 ps Between units: < 500 ps With skew calibration, within a unit: < 100 ps Between units: < 150 ps

Functions &Characteristics

Up-to 8 analog channels
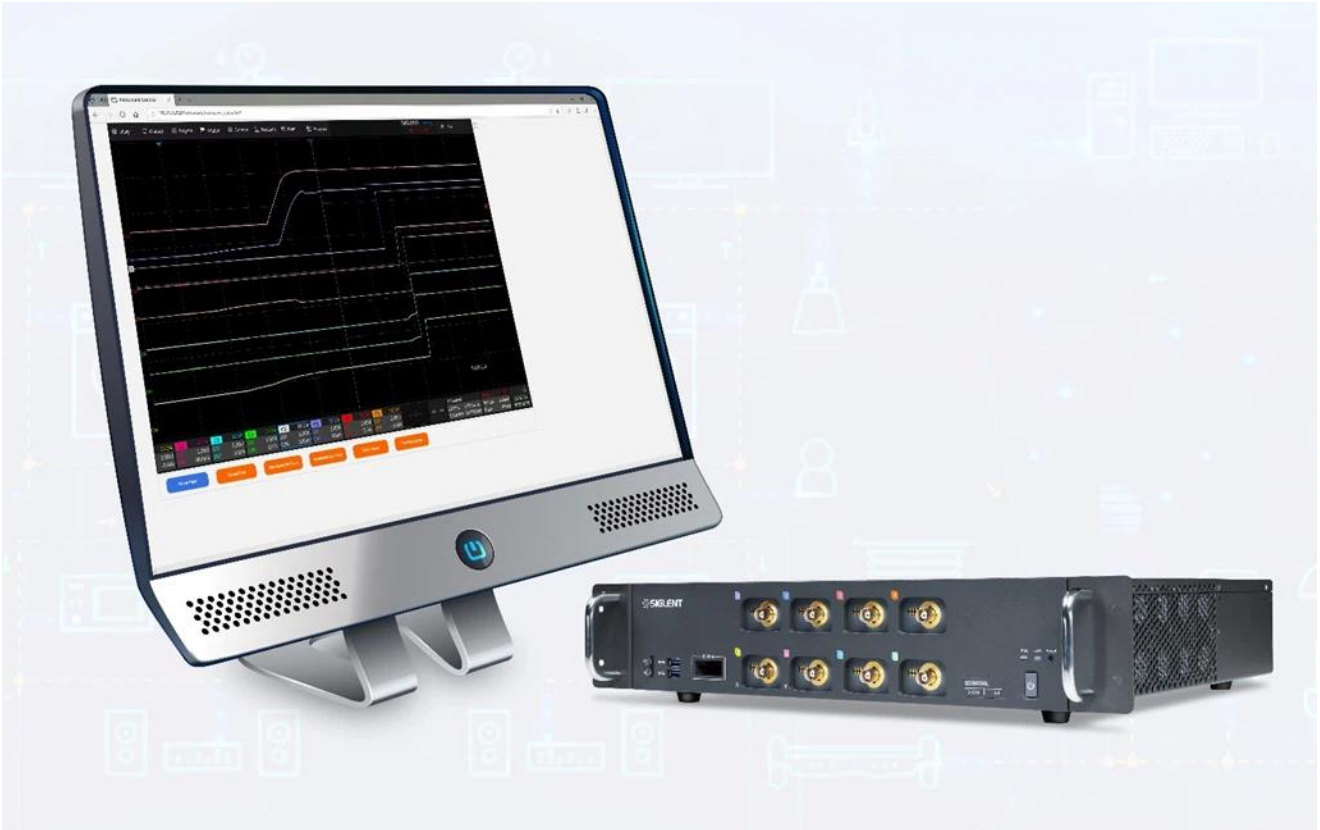
Monitor and control up-to 8 analog channels and 16 logic channels with one SDS6000L mainframe. Easily view all data using the convenient VNC web control

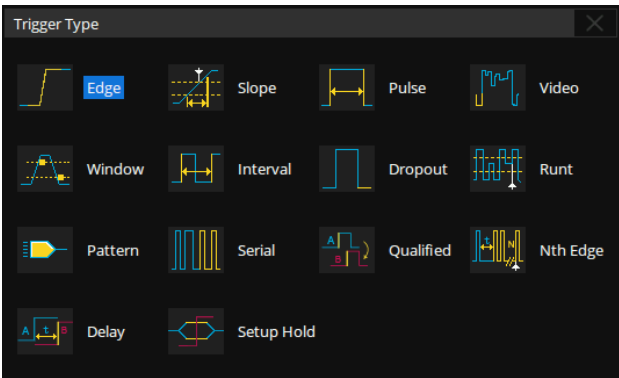## Flexible Multi-channel High-speed Acquisition System

- Standard sizes: 4 – channel models – 1U,8-channel models – 2U
- Multiple units are combined to create a high-speed acquisition system with up to 512 channels by being triggered with low-skew synchronization signals from the 64-channel synchronization distributor SYN64
- The host can access each unit over 1000M LAN. A complete SCPI command set as well as LabVIEW and IVI drivers are provided for easy data acquisition. The LAN port is LXI compliant.
- Sample clocks are synchronized between all units in the test system by cascading the 10 MHz In and 10 MHz Out clocks in a daisy chain
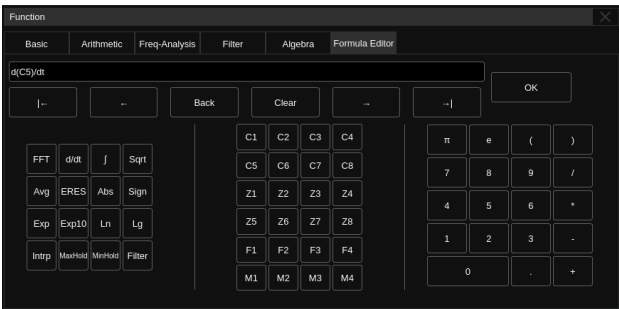
High Waveform Update Rate
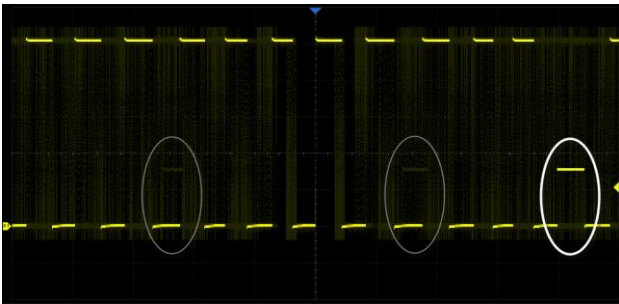
With a waveform update rate of up to 170,000 wfm/s, the oscilloscope can easily capture unusual or low-probability events. In Sequence mode, the waveform capture rate can reach 750,000 wfm/s

Deep Record Length

Using a hardware-based Zoom technique and record length of up to 500 Mpts, users can select a slower timebase without compromising the sample rate, and then quickly zoom in to focus on the area of interest.
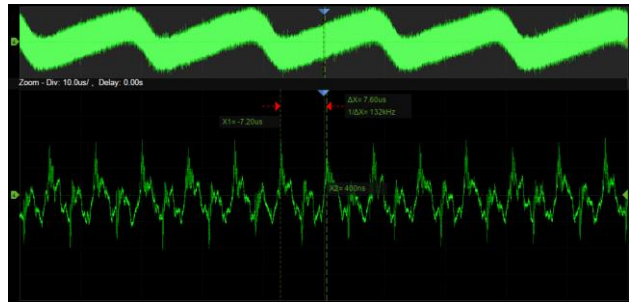
Multiple Trigger Functions

Edge, Slope, Pulse, Video, Windows, Runt, Interval, Dropout, Pattern, Qualified, Nth edge, Setup/ hold, Delay, and serial trigger.

Trigger Zone

Trigger Zone is available for advanced triggering.
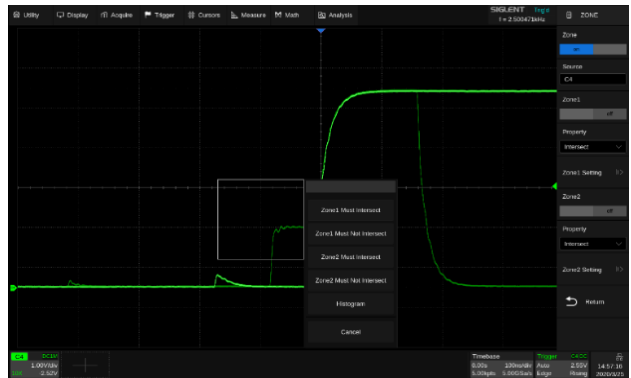
Advanced Math Function

In addition to the traditional (+, −, X, /) operations, FFT, integration, differential, square root, and more are supported. Formula Editor is available for more complex operations. 8 math traces are available.
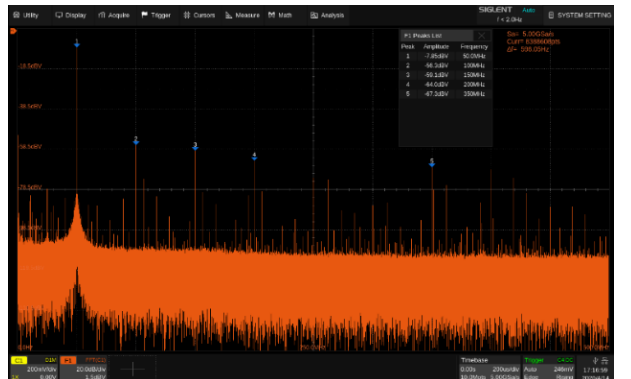
Hardware-accelerated FFT supports up to 8 Mpts operation. This provides high-frequency resolution with a fast refresh rate. The FFT function also supports a variety of window functions so that it can adapt to different spectrum measurement needs. Three modes (Normal, Average, and Max hold) can satisfy different requirements for observing the power spectrum. Auto peak detection and markers are supported.

Measurements of a Variety of Parameters
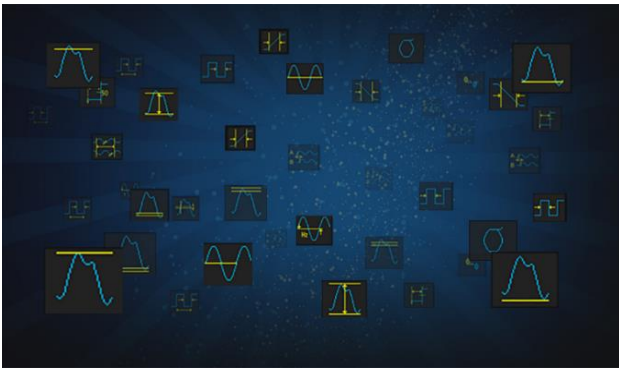
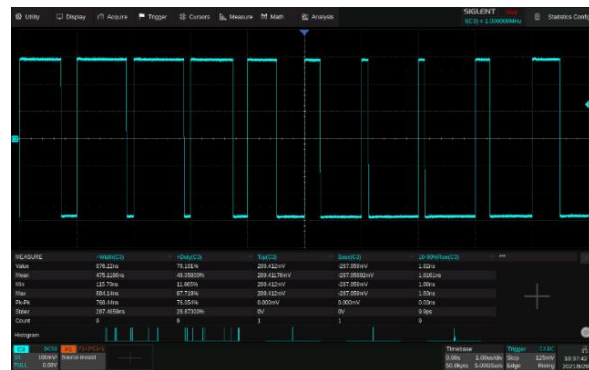Parameter measurements include 4 categories: horizontal, vertical, miscellaneous, and CH delay providing a total of 60+ different types of measurements. Measurements can be performed within a specified gate period. Measurements on Math, Reference, and History frames are supported.

Parameter Statistics Function

Statistics show the current value, maximum value, minimum value, standard deviation, and mean value of up to 12 parameters simultaneously. A histogram is available to show the probability distribution of a parameter. Trend and Track are available to show the parameter value vs. time.

For horizontal parameters such as period, all results are extracted from a frame, instead of just calculating the first one. This accelerates statistics on horizontal measurements much more and enables distribution observation in a frame using Histogram and Track.

History Mode
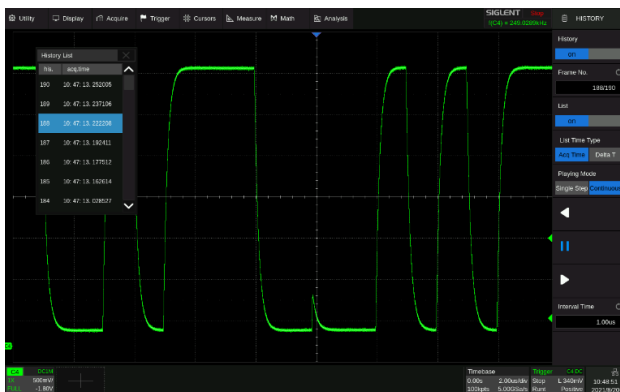
The history function can record up to 80,000 frames of waveforms. The recording is executed automatically so that the customer can playback the history waveforms at any time to observe unusual events and quickly locate the area of interest using cursors or measurements. The failed frames of the Mask Test can be stored as history frames.

Sequence Mode
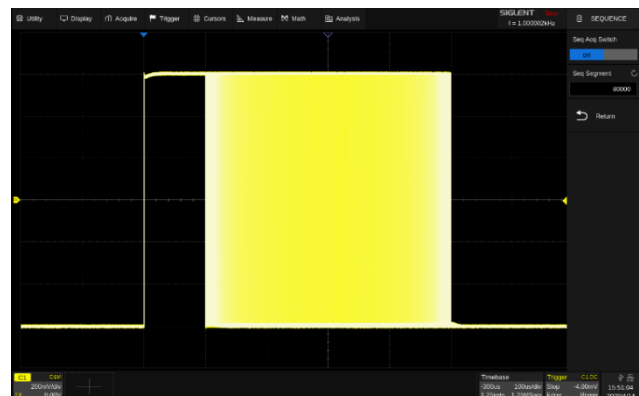
Segmented memory collection will store the waveform into multiple memory segments (up to 80,000) and each segment will store a triggered waveform as well as the dead time information. The interval between segments can be as small as 1.3µs. All of the segments can be played back using the History function.

Search and Navigate
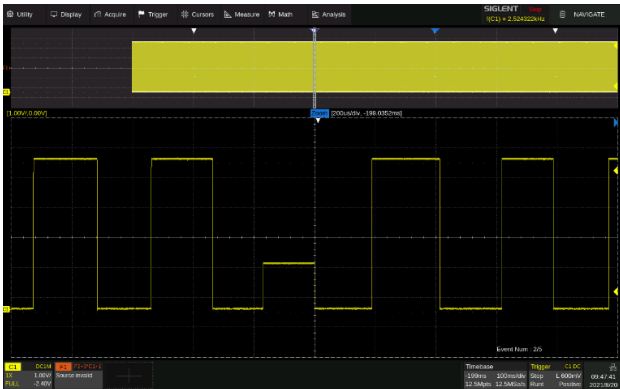
The oscilloscope can search events specified by the user in a frame. Events flagged by the Search can be recalled automatically using Navigate. It can also navigate by time (delay position) and history frames.

Serial Bus Decode

Display the decoded characters through the events list. Bus protocol information can be quickly and intuitively displayed in tabular form. I2C, SPI, UART, CAN, LIN, CAN FD, CAN XL, FlexRay, I2S, MIL-STD-1553B, SENT, ARINC429, SpaceWire, USB2.0 and Manchester are supported.

Hardware-based High Speed Mask Test Function
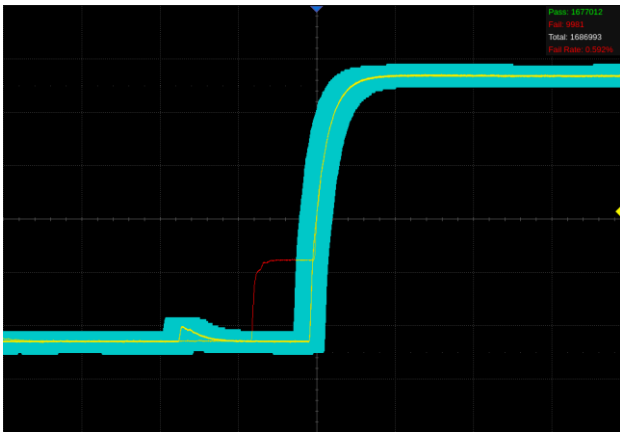
The oscilloscope utilizes a hardware-based Mask Test function, performing up to 18,000 Pass / Fail decisions each second. It is easy to generate user-defined test templates to provide trace mask comparisons, making it suitable for long-term signal monitoring or automated production line testing.
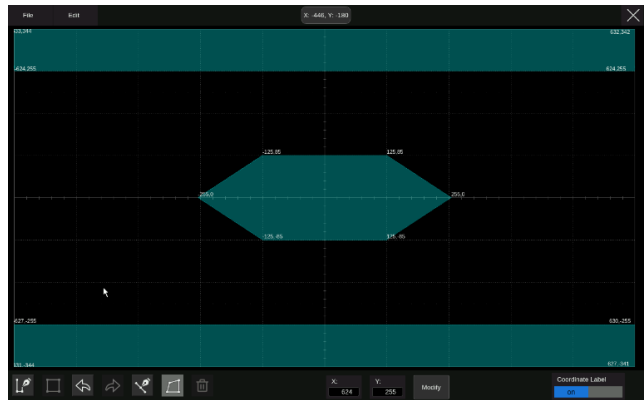
Built-in Mask Editor application helps to create custom masks.

Eye / Jitter Analysis
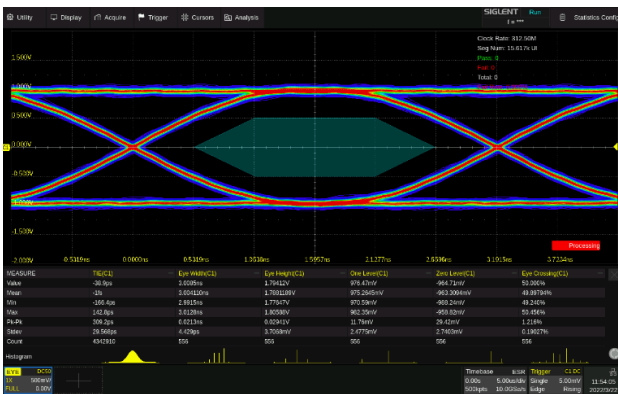
Supports eye diagram and jitter analysis / measurement. It can automatically extract the embedded reference clock from serial data and create an eye diagram. Measurement on multiple eye / jitter parameters is provided and mask testing of eye diagrams is supported.

Power Analysis (Optional)

The Power Analysis option provides a full suite of power measurements and analysis, which greatly improves the measurement efficiency in switching power supplies and power devices design.

Digital Channels / MSO

Four analog channels plus 16 digital channels enable users to acquire and trigger the waveforms and then analyze the pattern, simultaneously with one instrument.

25 MHz Function/Arbitrary Waveform Generator (Optional)
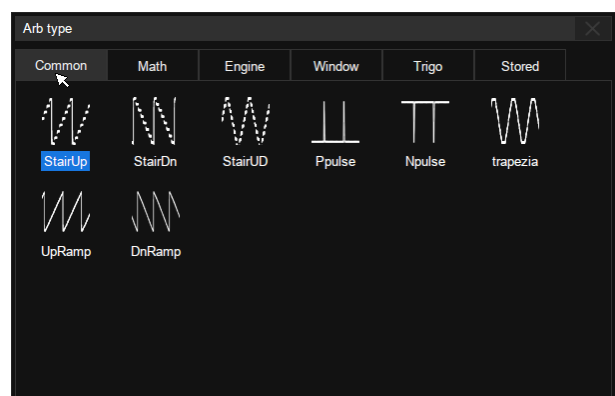
The built-in Function / Arbitrary waveform generator can output waveform with up to 25 MHz frequency and ±3V amplitude. Six basic waveforms plus multiple types of arbitrary waveforms are built-in.

Complete Connectivity

HDMI (1280 x 800) x1, USB Host 3.0 x2, USB Host 2.0 x2, USB Device 2.0 (USBTMC) x1, 1000M LAN (VXI–11 / Telnet / Socket)x1, micro SD card x1, Auxiliary output (Pass / Fail, Trigger Out) x1, 10 MHz In x1, 10 MHz Out x1

Specifications

Unless otherwise specified, all specifications can be guaranteed to meet the following conditions:

- Within the validity period of product calibration.
- Within the ambient temperature range of 18 ℃ ~ 28 ℃.
- The instrument is powered on and operating for more than 30 minutes.

Acquire (analog)	
Sample rate	5 GSa/s (10 GSa/s (ESR[*1]) @ each channel
Memory depth [*2,3]	500 Mpts/ch (single-channel) 250 Mpts/ch (dual-channel) 125 Mpts/ch (3 or 4 channels)
Waveform update rate	Normal mode: up to 170,000 wfm/s Sequence mode: up to 750,000 wfm/s
Intensity grading	256-level
Peak detect	200 ps
Average	4, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192
ERES	Enhanced bit: 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4 bit
Sequence	Up to 80,000 segments, interval between triggers = 1.3 μs min.
History	Up to 80,000 frames
Interpolation	sinx/x, x

* 1: ESR: Enhanced Sample Rate provides better measurement accuracy by using 2x interpolation

* 2: In Average and ERES modes, the memory depth is 25 Mpts/ch

* 3: C1~C4 as a group and C5~C8 as another group. In a group:

    Single-channel: Only one channel is enabled in a group

    Dual-channel: Two channels are enabled in a group

Vertical (analog)	SDS6208L SDS6204L	SDS6108L SDS6104L	SDS6058L SDS6054L
Channel	8/4 + EXT		
Resolution	8-bit Up to 12-bit in ERES mode, equivalent to 16-bit Hi-Res mode		
Bandwidth (–3dB)@50Ω	2 GHz [*1]	1 GHz	500 MHz
Rise time@50Ω (typical)	≤0.1V/div : 240 ps >0.1V/div : 260 ps	400 ps	700 ps
Bandwidth (–3dB)@1MΩ, with probe	500 MHz		
Bandwidth in ERES mode (typical)	0.5-bit: 0.25*Sample rate, up to the analog bandwidth 1-bit: 0.115*Sample rate, up to 1.15 GHz, limited by the analog bandwidth 1.5-bit: 0.055*Sample rate, up to 550 MHz, limited by the analog bandwidth 2-bit: 0.028*Sample rate, up to 280 MHz 2.5-bit: 0.014*Sample rate, up to 140 MHz 3-bit: 0.007*Sample rate, up to 70 MHz 3.5-bit: 0.0035*Sample rate, up to 35 MHz 4-bit: 0.0017*Sample rate, up to 17 MHz		

Range	8 divisions
Vertical scale (probe 1X)	1 MΩ: 0.5 mV/div – 10 V/div 50 Ω: 0.5 mV/div – 1 V/div
DC gain accuracy	± 1.5%
Offset accuracy	± (1% of the offset setting + 0.5% of full scale + 0.02% of max offset + 1mV)

Offset range (probe 1X)	1MΩ: 0.5 mV/div ~ 5 mV/div: ± 1.6 V
	     5.1 mV/div ~ 10 mV/div: ± 4 V
	     10.2 mV/div ~ 20 mV/div: ± 8 V
	     20.5 mV/div ~ 100 mV/div: ± 16 V
	     102 mV/div ~ 200 mV/div: ± 80V
	     205 mV/div ~ 1 V/div: ± 160 V
	     1.02 V/div ~ 10 V/div: ± 400 V
	
	50 Ω: 0.5 mV/div ~ 5 mV/div: ± 1.6 V
	     5.1 mV/div ~ 10 mV/div: ± 4 V
	     10.2 mV/div ~ 20 mV/div: ± 8 V
	     20.5 mV/div ~ 1 V/div: ± 10 V

Bandwidth limit	Hardware Bandwidth limit: 20 MHz ± 20%, 200 MHz ± 20%
Low-frequency response (AC coupling –3 dB)	6 Hz (typical)
Overshoot (100 mV/div, 150 ps edge @50 Ω, typical)	22%	10%	5%
Coupling	DC, AC, GND
Impedance	(1 MΩ ± 2%) ‖ (20 pF ± 3pF) 50 Ω: 50 Ω ± 2%
Max. Input voltage	1 MΩ < 400 Vpk(DC + AC), DC~10 kHz 50 Ω < 5 Vrms, ±10V Peak
SFDR	> 45 dBc
CH to CH Isolation (@50Ω)	70 dB up to 200 MHz 60 dB up to 500 MHz 50 dB up to 1 GHz 40 dB up to 2 GHz
Probe Attenuation	1X, 10X, 100X, custom

* 1: The bandwidth is 1 GHz below 2.3 mV/div

Horizontal	SDS6208L SDS6204L	SDS6108L SDS6104L	SDS6058L SDS6054L
Time scale	0.1 ns/div – 1000 s/div	0.2 ns/div – 1000 s/div	0.5 ns/div – 1000 s/div
Range	10 divisions		
Display mode	Y–T, X–Y, Roll		
Roll mode	≥ 50 ms/div		
Skew (C1~C8)	< 100 ps		
Time base Accuracy	± 2 ppm initial (0~50℃); ± 0.5 ppm 1st year aging; ± 3 ppm 20-year aging		

Trigger	
Mode	Auto, Normal, Single
Level	Internal: ± 4.5 div from the center of the screen EXT: ± 0.61 V EXT/5: ± 3.05 V
Hold off range	By time: 8 ns ~ 30 s (8 ns step) By event: 1 ~ 108
Coupling	C1~C8 DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 15 Hz LFRJ: Attenuates the frequency components below 2.4 MHz HFRJ: Attenuates the frequency components above 1.3 MHz Noise RJ: Increases the trigger hysteresis EXT DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 15 Hz LFRJ: Attenuates the frequency components below 2.5 MHz HFRJ: Attenuates the frequency components above 1.3 MHz
Accuracy (typical)	C1 ~ C8: ± 0.2 div EXT: ± 0.3 div

Sensitivity			Noise RJ = OFF	Noise RJ = ON
	C1 ~ C8:	>10 mV/div:	0.52 div	0.66 div
		5 mV/div~10 mV/div:	0.52 div	0.66 div
		≤ 2 mV/div:	1 div	1 div
	EXT:	200 mVpp, DC ~ 10 MHz 300 mVpp, 10 MHz ~ bandwidth (300 MHz)		
	EXT/5:	1 Vpp, DC ~ 10 MHz 1.5 Vpp, 10 MHz ~ bandwidth (300 MHz)		

Jitter	C1 ~ C8: < 9 ps RMS (typical) for ≥ 300 MHz sine and ≥ 6 divisions peak to peak amplitude for vertical gain settings from 2.5 mV/div to 10 V/div < 5 ps RMS (typical) for ≥ 500 MHz sine and ≥ 6 divisions peak to peak amplitude for vertical gain settings from 2.5 mV/div to 10 V/div EXT: < 50 ps rms
Displacement	Pre-Trigger: 0 ~ 100% memory Delay-Trigger: 0 ~ 10,000 div
Zone	Up to 2 zones Source: C1~C8 Property: Intersect, Not Intersect
Edge Trigger	
Source	C1~C8 / EXT / (EXT/5) / AC Line / D0~D15
Slope	Rising, Falling, Rising & Falling
Slope Trigger	
Source	C1 ~ C8
Slope	Rising, Falling

Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Pulse Width Trigger	
Source	C1~C8 / D0~D15
Polarity	+wid, –wid
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Video Trigger	
Source	C1 ~ C8
Standard	NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, Custom
Synchronization	Any, Select
Trigger Condition	Line, Field
Window Trigger	
Source	C1 ~ C8
Window type	Absolute, Relative
Interval Trigger	
Source	C1 ~ C8 / D0~D15
Slope	Rising, Falling
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Dropout Trigger	
Source	C1 ~ C8 / D0~D15
Timeout type	Edge, State
Slope	Rising, Falling
Time range	2 ns ~ 20 s, Resolution = 1 ns
Runt Trigger	
Source	C1 ~ C8
Polarity	Positive, Negative
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Pattern Trigger	
Source	C1 ~ C8 / D0 ~ D15
Pattern Setting	Don't Care, Low, High
Logic	AND, OR, NAND, NOR
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Qualified Trigger	
Type	State, State with Delay, Edge, Edge with Delay
Qualified Source	C1~C8 / D0~D15
Edge Trigger Source	C1~C8 / D0~D15

Nth Edge Trigger	
Source	C1 ~ C8 / D0 ~ D15
Slope	Rising, Falling
Idle time	8 ns ~ 20 s, Resolution = 1 ns
Edge Number	1 ~ 65535
Delay Trigger	
Source A	C1 ~ C8 / D0~D15
Source B	C1 ~ C8 / D0~D15
Slope	Rising, Falling
Limit range	<, >, in range, out of range
Time range	2 ns ~ 20 s, Resolution = 1 ns
Serial Trigger	
Source	C1~C8 / D0~D15
Protocol	Standard: I2C, SPI, UART, CAN, LIN Optional: CAN FD, FlexRay, I2S, MIL–STD–1553B, SENT
I^2C	Type: Start, Stop, Restart, No Ack, EEPROM, Address & Data, Data Length
SPI	Type: Data
UART	Type: Start, Stop, Data, Parity Error
CAN	Type: All, Remote, ID, ID+Data, Error
LIN	Type: Break, Frame ID, ID+Data, Error
CAN FD(Optional)	Type: Start, Remote, ID, ID+Data, Error
FlexRay(Optional)	Type: TSS, Frame, Symbol, Errors
I^2S (Optional)	Type: Data, Mute, Clip, Glitch, Rising Edge, Falling Edge
MIL–STD–1553B (Optional)	Type: Transfer, Word, Error, Timing
SENT (Optional)	Type: Start, Slow channel, Fast channel, Error

Serial Decoder	
Decoders	2
Threshold	– 4.1 ~ 4.1 div
List	1 ~ 7 lines
Decoder type	Full duplex
I^2C	
Source	C1 ~ C8 / D0 ~ D15
Signal	SCL, SDA
Address	7–bit, 10–bit
SPI	
Source	C1 ~ C8 / D0 ~ D15
Signal	CLK, MISO, MOSI, CS
Edge Select	Rising, Falling
Chip select	Active high, Active low, Clock timeout

Bit Order	LSB, MSB
UART	
Source	C1 ~ C8 / D0 ~ D15
Signal	RX, TX
Data Width	5-bit, 6-bit, 7-bit, 8-bit
Parity Check	None, Odd, Even, Mark, Space
Stop Bit	1-bit, 1.5-bit, 2-bit
Idle Level	Low, High
Bit Order	LSB, MSB
CAN	
Source	C1 ~ C8 / D0 ~ D15
LIN	
LIN Version	Ver 1.3, Ver 2.0
Source	C1 ~ C8 / D0 ~ D15
Baud Rate	600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, Custom
CAN FD（Optional）	
Source	C1 ~ C8 / D0 ~ D15
Nominal Baud Rate	10 kbps, 25 kbps, 50 kbps, 100 kbps, 250 kbps, 1 Mbps, Custom
Data Baud Rate	500 kbps, 1 Mbps, 2 Mbps, 5 Mbps, 8 Mbps, 10 Mbps, Custom
CAN XL（Optional）	
Source	C1 ~ C8 / D0 ~ D15
Type	SIC Mode/Fast Mode
Nominal Baud	10 kbps, 25 kbps, 50 kbps, 100 kbps, 250 kbps, 1 Mbps, 2 Mbps, 5 Mbps, 8 Mbps, 10 Mbps, Custom
FD Baud	500 kbps, 1 Mbps, 2 Mbps, 5 Mbps, 8 Mbps, 10 Mbps, Custom
XL Baud	500 kbps, 1 Mbps, 2 Mbps, 5 Mbps, 8 Mbps, 10 Mbps, 12 Mbps, 15 Mbps, 20 Mbps, Custom
FlexRay（Optional）	
Source	C1 ~ C8 / D0 ~ D15
Baud Rate	2.5 Mbps, 5 Mbps, 10 Mbps, Custom
I^{2}S（Optional）	
Source	C1 ~ C8 / D0 ~ D15
Signal	BCLK, WS, DATA
Audio Variant	Audio-I^{2}S, Audio-LJ, Audio-RJ
Start Bits	0 ~ 31
Data Bits	1 ~ 32
MIL-STD-1553B（Optional）	
Source	C1 ~ C8
SENT（Optional）	
Source	C1 ~ C8 / D0 ~ D15
Manchester（Optional）	
Source	C1 ~ C8

Baud Rate	500 bps ~ 5 Mbps
ARINC429（Optional）	
Source	C1~C8
Baud Rate	12.5 kbps~100 kbps, tolerance 1%~20%
Word format	L/SDI/D/SSM，L/D/SSM，L/D
SpaceWire（Optional）	
Source	C1 ~ C4
Signal	Data，Strobe
Clock Recovery	Fixed speed, Auto detect
Baud Rate	2 Mbps, 5 Mbps, 10 Mbps, 20 Mbps, 50 Mbps, 100 Mbps, 200 Mbps, 400 Mbps, Custom
Sync Mode	Auto, Nulls, Pattern, Manual
View mode	N/L-char, Packet
USB2.0（Optional）	
Source	Full speed/low speed: C1 ~ C4/D0 ~ D15 High speed: C1 ~ C8
Speed	Low speed (1.5 Mbps), Full speed (12 Mbps), High speed (480 Mbps)

Measurement	
Automatic Measurement	
Source	C1 ~ C8, D0 ~ D15, Z1 ~ Z8, F1 ~ F8, M1 ~ M4, Ref, History
Mode	Simple, Advanced
Range	Screen Gated: inside screen, definable with separate Gate cursors
Custom Threshold	Upper, Middle, Lower
No. of Measurements	Display 12 measurements at the same time (Display mode = M2)
Vertical Parameters	Max, Min, Pk-Pk, Top, Base, Amplitude, Mean, Cycle Mean, Stdev, Cycle Stdev, RMS, Cycle RMS, Median, Cycle Median, FOV, FPRE, ROV, RPRE, Level@Trigger, UpperLower
Horizontal Parameters	Period, Frequency, Time@max, Time@min, +Width, -Width, 10-90%Rise time, 90-10%Fall time, Rise time, Fall time, +Burst Width, -Burst Width, +Duty Cycle, -Duty Cycle, Delay, Time@Middle, Cycle-Cycle jitter
Miscellaneous Parameters	+Area@DC, -Area@DC, Area@DC, Absolute Area@DC, +Area@AC, -Area@AC, Area@AC, Absolute Area@AC, Cycles, Rising Edges, Falling Edges, Edges, Positive pulses, Negative pulses, Positive Slope, Negative Slope
Delay Parameters	Phase, FRFR, FRFF, FFFR, FFFF, FRLR, FRLF, FFLR, FFLF, Skew, Tsu@R, Tsu@F, Th@R, Th@F, △Time1-4
Statistics	Current, Mean, Min, Max, Sdev, Count, Histogram, Trend, Track
Statistics Count	Unlimited, 1~1024
Cursors	
Source	C1~C8, D0~D15, F1~F8, M1~M4, Ref, Histogram
Type	Manual: Time X1, X2, (X1-X2), (1/ΔT); Vertical Y1, Y2, (Y1-Y2) Track: Time X1, X2, (X1-X2) Measure: Indicates the measurement of a specific parameter

Math	
Trace	F1~F8

Source	C1~C8, Z1~Z8, F1~F8, M1~M4
Operation	FFT(magnitude and phase), +, −, x, ÷, ∫dt, d/dt, √ , Identity, Negation, Absolute, Sign, ex, 10x, ln, lg, Interpolation, MaxHold, MinHold, ERES, Average, tan, atan, envelope, filter, formula editor
FFT	Length: 8 Mpts, 4 Mpts, 2 Mpts, 1 Mpts, 512 kpts, 256 kpts, 128 kpts, 64 kpts, 32 kpts, 16 kpts, 8 kpts, 4 kpts, 2 kpts Window: Rectangular, Blackman, Hanning, Hamming, Flattop, Blackman-Harris, Gaussian Display: Full Screen, Split, Exclusive Mode: Normal, Max hold, Average Tools: Peaks, Markers

Analysis	
Search	
Source	C1 ~ C8, History
Mode	Edge, Slope, Pulse, Interval, Runt
Copy setting	Copy from trigger, Copy to trigger
Navigate	
Type	Search event, Time, History frame
Mask Test	
Source	C1 ~ C8, Z1 ~ Z8
Mask creating	Auto (Create mask), Customized (Mask Editor)
Mask test speed	Up to 18,000 frames/s
DVM	
Source	C1 ~ C8
Mode	DC mean, DC RMS, AC RMS, Peak-peak, Amplitude
Plot	Bar, Histogram, Trend
Gate	20 ms
Bode Plot	
Source	C1 ~ C4
Supported signal sources	SAG1021I (Connection: USB), SDG series waveform generators (Connection: USB, LAN)
Power Analysis (optional)	
Source	C1 ~ C4
Measure	Power quality, Current Harmonics, Inrush current, Switching loss, Slew rate, Modulation, Output ripple, Turn on/turn off, Transient response, PSRR, Efficiency, SOA
Histogram	
Source	C1 ~ C8
Type	Horizontal, Vertical, Both
Counter	
Source	C1 ~ C8
Frequency resolution	7 digits
Totalizer	Counter on edges, supports Gate and Trigger
SignalScan	
Source	C1 ~ C4, F1 ~ F4, M1 ~ M4, D0 ~ D15
Mode	Edge, Non-monotonic, Runt, Measure, Serial pattern, Bus pattern, Protocol Decode
Eye Diagram (optional)	

Source	C1 ~ C8
Clock recovery	Constant frequency, PLL
Measure	Eye height, "1" level, "0" level, Eye amplitude, Eye width, Eye crossing, Average power, Q factor, TIE, Rise time, Fall time, Vpp
Mask Test	Supported
Jitter Analysis (optional)	
Source	C1 ~ C8
Clock recovery	Constant frequency, PLL
Measure	Period, Frequency, +Width, –Width, +Duty cycle, –Duty cycle, Cycle–cycle jitter, Cycle–cycle +width, Cycle–cycle –Width, Cycle–cycle +Duty cycle, Cycle–cycle –Duty cycle, Bit Rate, Unit interval
Jitter decomposition	TIE, RJ, DJ, DCD, DDJ, PJ, TJ@BER Statistics: Histogram, Track, Spectrum

Digital Channels

Max. Sampling Rate	1 GSa/s
Memory Depth	50 Mpts/ch
Min. Detectable Pulse Width	3.3 ns
Level Group	D0~D7, D8~D15
Level Range	–10 V~10 V
Logic Type	TTL, CMOS, LVCMOS3.3, LVCMOS2.5, Custom
Skew	D0~D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns)

Waveform Generator (optional)

Channels	1
Max. Output Frequency	25 MHz
Sampling Rate	125 MSa/s
Frequency Resolution	1 µHz
Frequency Accuracy	± 50 ppm
Vertical Resolution	14–bit
Amplitude Range	–1.5 V ~ +1.5 V (into 50 Ω) –3 V ~ +3 V (into High–Z)
Waveforms	Sine, Square, Ramp, Pulse, DC, Noise, 45 Arbitrary
Output Impedance	50 Ω ± 2%
Protection	Over–voltage protection, Current limit
Sine	
Frequency	1 µHz ~ 25 MHz
Offset accuracy (10 kHz)	± (1%*offset setting value +3 mVpp)
Amplitude flatness	± 0.3 dB, compared to 10 kHz, 2.5 Vpp into 50 Ω
SFDR	DC ~ 1 MHz –60 dBc

	1 MHz ~ 5 MHz −55 dBc
	5 MHz ~ 25 MHz −50 dBc
Harmonic distortion	DC ~ 5 MHz −50 dBc
	5 MHz ~ 25 MHz −45 dBc
Square / Pulse	
Frequency	1 µHz ~ 10 MHz
Duty cycle	1% ~ 99%
Edge	< 24 ns (10% ~ 90%)
Overshoot	< 3% (typical, 1 kHz, 1 Vpp)
Pulse width	> 50 ns
Jitter (cycle-cycle)	< 500 ps + 10 ppm
Ramp	
Frequency	1 µHz ~ 300 kHz
Linearity	< 0.1% of Pk–Pk (typical, 1 kHz, 1 Vpp, 50% symmetry)
Channels	0% ~ 100%
DC	
Offset range	± 1.5 V (into 50 Ω)
	± 3 V (into Hi–Z)
Accuracy	± (|setting value|*1% + 3 mV)
Noise	
Bandwidth (−3 dB)	>25 MHz
Arb	
Frequency	1 µHz ~ 5 MHz
Waveform memory	16 kpts
Sample rate	125 MSa/s
Wave import	From EasyWaveX, from U-disk, directly from waveform data of analog channels

I/O	
Front	USB 3.0 Host x2 , Calibration Signal: 1 kHz,3 V Square
Rear	USB 2.0 Host x2, USB 2.0 Device, LAN: 10 / 100M / 1000M BaseT (RJ45), Micro SD Card, External Trigger, EXT: ≤1.5 Vrms, EXT/5: ≤ 7.5Vrms, Auxiliary Output: TRIG OUT (3.3 V LVCMOS), PASS/FAIL OUT (3.3 V TTL), HDMI 10 MHz In, 10 MHz Out AWG

Display Setting	
Range	8 x 10 grid
Display Type	Dot, Vector
Persistence Time	OFF, 0.1 s, 0.2 s, 0.5 s, 1 s, 5 s, 10 s, 30 s, infinite

Color Display	Normal, Color; Supports customer trace color
Language	Simplified Chinese, Traditional Chinese, English, French, Japanese, German, Spanish, Russian, Italian, Portuguese
Built-in Help System	Simplified Chinese, English

Environmental			
Temperature	Operating: 0℃ ~ 50℃ Non-operating: –30℃ ~ 70℃		
Humidity	Operating: 5% ~ 90%RH, 30℃, degraded to 50%RH at 40℃ Non-operating: 5% ~ 95%		
Altitude	Operating: ≤ 3,048 m, 25℃ Non-operating: ≤12,192 m		
Electromagnetic Compatibility	Meets EMC directive (2014/30/EU), meets or exceeds IEC 61326–1:2012/EN61326–1:2013 (Basic)		
	Conducted disturbance	CISPR 11 / EN 55011	CLASS A group 1 150 kHz – 30 MHz
	Radiated disturbance	CISPR 11 / EN 55011	CLASS A group 1 30 MHz – 1 GHz
	Electrostatic discharge (ESD)	IEC 61000–4–2 / EN 61000–4–2	4.0 kV (Contact), 8.0 kV (Air)
	Radio-frequency electromagnetic field Immunity	IEC 61000–4–3 / EN 61000–4–3	10 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7GHz)
	Electrical fast transients (EFT)	IEC 61000–4–4 / EN 61000–4–4	2kV (Input AC Power Ports)
	Surges	IEC 61000–4–5 / EN 61000–4–5	1kV (Line to line) 2kV (Line to ground)
	Radio-frequency continuous conducted Immunity	IEC 61000–4–6 / EN 61000–4–6	3 V, 0.15–80MHz
	Voltage dips and interruptions	IEC 61000–4–11/EN 61000–4–11	Voltage Dips: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Voltage interruptions: 0% UT during 250/300 cycles
Safety	UL 61010–1:2012/R: 2018–11; CAN/CSA–C22.2 No. 61010–1:2012/A1:2018–11. UL 61010–2–030:2018; CAN/CSA–C22.2 No. 61010–2–030:2018.		
RoHS	EU 2015/863		

Power Supply	8-channel	4-channel
Input Voltage & Frequency	100 ~ 240 Vrms 50/60Hz 100 ~ 120 Vrms 400 Hz	
Power consumption	380 W max., 240 W typical, 8 W typical in standby mode	193 W max., 120 W typical, 4 W typical in standby mode

Mechanical	8-channel	4-channel
Dimensions	Length × Height × Width = 395 mm × 86 mm × 414 mm Including rear I/O: 395 mm × 86 mm × 431 mm	Length × Height × Width = 395 mm × 43 mm × 414 mm Including rear I/O: 395 mm × 43 mm × 431 mm
Weight	Net Weight 9.1 kg	Net Weight 6.1 kg

Ordering Information

Product Model	Description
SDS6208L	2 GHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 8-channel
SDS6204L	2 GHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 4-channel
SDS6108L	1 GHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 8-channel
SDS6104L	1 GHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 4-channel
SDS6058L	500 MHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 8-channel
SDS6054L	500 MHz bandwidth, 5 GSa/s sample rate, 8-bit, 500 Mpts memory depth, 4-channel

Standard Accessories	Quantity
USB cable	1
Quick start	1
Passive probe	1/channel
Certificate of calibration	1
Wireless mouse	1
Power cord	1

Optional Accessories	Description
SP6150A	High-speed passive probe: 1.5 GHz, 10X, Input impedance 1.8 pF ‖ 500 Ω
SAP1000	High-speed active probe: 1 GHz, 10X, Input impedance 1.2 pF ‖ 1 MΩ, Input dynamic range ± 8 V, Offset range ±12 V, SAPBus interface
SAP2500	High-speed active probe: 2.5 GHz, 10X, Input impedance 1.1 pF ‖ 1 MΩ, Input dynamic range ±8 V, Offset range ±12 V, SAPBus interface
SAP2500D	High-speed differential probe: 2.5 GHz, 10X, Input impedance (differential) 1 pF ‖ 200 kΩ, Input dynamic range ±4 V, Offset range ±8 V, SAPBus interface
HPB4010	High voltage passive probe: DC-40MHz, 1000X, Input impedance 3.0 pF ‖ 100 MΩ, Max. measurement voltage DC: 0~10 kVDC, AC: ≤ 7 kVrms (Sinewave), 20 kVp-p (Pulse)
DPB1300	High voltage differential probe: 50 MHz, 50X/500X, Max differential test voltage (DC + Peak AC) ±1300 V, Max input common mode voltage CATⅢ 600 V / CATII 1000 V, 12 V adapter power supply
DPB5150	High voltage differential probe: 70 MHz, 50X/500X, Max differential test voltage (DC + Peak AC) ±1500 V, Max input common mode voltage CATⅢ 600 V / CATII 1000 V, USB 5V adapter power supply
DPB5150A	High voltage differential probe: 100 MHz, 50X/500X, Max differential test voltage (DC + Peak AC) ±1500 V, Max input common mode voltage CATⅢ 600 V / CATII 1000 V, USB 5V adapter power supply
DPB5700	High voltage differential probe: 70 MHz, 100X/1000X, Max differential test voltage (DC + Peak AC) ±7000 V, Max input common mode voltage CATⅢ 1000 V, USB 5V adapter power supply
DPB5700A	High voltage differential probe: 100 MHz, 100X/1000X, Max differential test voltage (DC + Peak AC) ±7000 V, Max input common mode voltage CATⅢ 1000 V, USB 5V adapter power supply

SCP5030	Current probe: DC–50 MHz, Conversion factor 1 V/A, 0.1 V/A, Max current 30 Arms/50 Apk, 300V, SAPBus interface
SCP5030A	Current probe: DC–100 MHz, Conversion factor 1 V/A, 0.1 V/A, Max current 30 Arms/50 Apk, 300V, SAPBus interface
SCP5150	Current probe: DC–12 MHz, Conversion factor 0.1 V/A, 0.01 V/A, Max current 150 Arms/300 Apk, CAT Ⅲ 300 V/CAT Ⅱ 600 V, SAPBus interface
SCP5500	Current probe: DC–2 MHz, Conversion factor 0.1 V/A, 0.01 V/A, Max current 500 Arms/750 Apk, CAT Ⅲ 300 V/CAT Ⅱ 600 V, SAPBus interface
CPL5100	Current probe: DC–600 kHz, Conversion factor 0.1 V/A, 0.01 V/A, Current range 50 mA –100 Apk, 12 V adapter power supply
CP4020	Current probe: DC–200 kHz, Conversion factor 5 mV/A, 50 mV/A, Max current 20 Arms/60 Ap-p, CAT Ⅲ 600 V/CAT Ⅱ 600 V, 9 V adapter power supply
CP4050	Current probe: DC–1 MHz, Conversion factor 50 mV/A, 500 mV/A, Max current 50 Arms/140 Ap-p, CAT Ⅲ 300 V/CAT Ⅱ 600 V, 9 V adapter power supply
CP4070	Current probe: DC–300 kHz, Conversion factor 5 mV/A, 50 mV/A, Max current 70 Arms/200 Ap-p, CAT Ⅲ 300 V/CAT Ⅱ 600 V, 9 V adapter power supply
CP4070A	Current probe: DC–300 kHz, Conversion factor 10 mV/A, 100 mV/A, Max current 70 Arms/200 Ap-p, CAT Ⅲ 600 V/CAT Ⅱ 600 V, 9 V adapter power supply
CP6030	Current probe: DC–50 MHz, Conversion factor 1 V/A, 0.1 V/A, Max current 30 Arms/50 Apk, 300V, 12 V adapter power supply
CP6030A	Current probe: DC–100 MHz, Conversion factor 1 V/A, 0.1 V/A, Max current 30 Arms/50 Apk, 300V, 12 V adapter power supply
CP6150	Current probe: DC–12 MHz, Conversion factor 0.1 V/A, 0.01 V/A, Max current 150 Arms/300 Apk, CAT Ⅲ 300 V/CAT Ⅱ 600 V, 12 V adapter power supply
CP6500	Current probe: DC–5 MHz, Conversion factor 0.1 V/A, 0.01 V/A, Max current 500 Arms/750 Apk, CAT Ⅲ 300 V/CAT Ⅱ 600 V, 12 V adapter power supply
SAP4000P	Power rail probe: DC – 4 GHz, 1.1X, Input impedance: 50 kΩ @ low frequency, 50 Ω @ high frequency, Input dynamic range ± 600 mV, Offset range ± 24 V, SAPBus interface
SPL2016	16-channel logic probe: Input impedance 100 kΩ ‖ 18 pF, Input dynamic range ±20 V, Min. input swing 800 mVpp, Max. data rate 300 Mbps (without lead), 100 Mbps (with lead)
SYN64	64-channel synchronization distributor
DF2001A	Power Analysis deskew fixture
STB3	STB3 demo signal source

Options	Part No.
Waveform generator (software)	SDS6000L-FG
Power Analysis (software)	SDS6000L-PA
Eye Diagram/Jitter Analysis (software)	SDS6000L-EJ
I²S trigger & decode (software)	SDS6000L-I²S
MIL-STD-1553B trigger & decode (software)	SDS6000L-1553B
FlexRay trigger & decode (software)	SDS6000L-FlexRay

CAN FD trigger & decode (software)	SDS6000L-CANFD
CAN XL decode (software)	SDS6000L-CANXL
SENT trigger & decode (software)	SDS6000L-SENT
Manchester decode (software)	SDS6000L-Manch
SpaceWire decode (software)	SDS6000L-SpaceWire
USB2.0 decode (software)	SDS6000L-USB20
ARINC429 decode (software)	SDS6000L-ARINC

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, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope 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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