

SDS1000X HD

digital oscilloscope

data sheet

CN01A



深圳市鼎阳科技股份有限公司
SIGLENT TECHNOLOGIES CO.,LTD

SDS1074X HD
SDS1104X HD
SDS1204X HD
SDS1072X HD
SDS1102X HD
SDS1202X HD

Product Overview

SDS1000X HD series high-resolution digital oscilloscope with the highest 12-bit vertical resolution, excellent noise floor performance and vertical measurement accuracy can meet higher precision measurement requirements. SDS1000X HD has a maximum bandwidth of 200 MHz, a sampling rate of up to 1 GSa/s, 2/4 analog channels and 16 digital channels, and a storage depth of up to 100 Mpts.

The SPO technology adopted by SDS1000X HD has a waveform capture rate as high as 400,000 frames per second, with 256 brightness levels and color temperature display;

New digital trigger system, high trigger sensitivity, small trigger jitter; support rich intelligent trigger, serial bus trigger and decoding; support history (History) mode, segmented acquisition (Sequence), template test, Advanced analysis modes such as search, navigation, Bode plot, and power analysis; with Rich measurement and mathematical operation functions. The SDS1000X HD incorporates 10.1-inch capacitive touch screen, supports a variety of gestures to realize the waveform and The common operation of the menu, combined with multiple one-key operation buttons on the front panel, greatly optimizes the efficiency of operating the oscilloscope and improves the user experience.



Features and Benefits

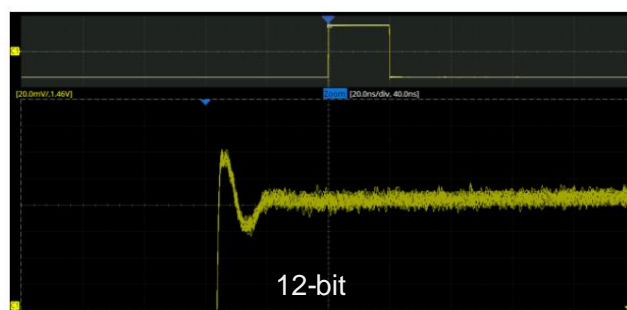
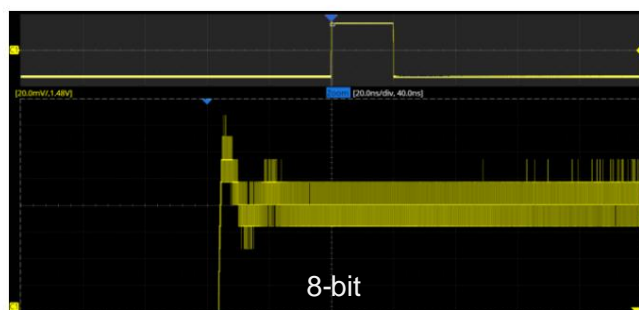
- Analog channel bandwidth: up to 200 MHz; real-time sampling rate up to 1 GSa/s
- Vertical resolution: 12-bit low noise floor, as low as 70 μ Vrms at full bandwidth of 200 MHz
- SPO technology
 - Waveform capture rate up to 400 000 frames per second (Sequence mode), 100 000 frames/sec (normal mode)
 - Support 256 levels of waveform brightness and color temperature display
 - Memory depth up to 100 Mpts/channel
 - Digital trigger
- Smart trigger: edge, slope, pulse width, window, runt, interval, Timeout, pattern, video trigger (support HDTV), etc.
- Serial bus triggering and decoding, supported protocols include standard I2C , SPI, UART, CAN, LIN
- Segmented acquisition (Sequence) mode, the maximum storage depth can be divided into 80,000 segments, according to the trigger conditions set by the user, with non-A very small dead time segment captures qualifying events. exist
- The waveform capture rate in Sequence mode is up to 400,000 frames/Second
- History mode (History), which can record up to 80,000 frames of waveform
- Dozens of automatic measurement functions, support measurement statistics, Gating measurement, Math measurement, History measurement, Ref measurement. Support for the histogram and trend graph statistics of measurement
- parameters 4 independent waveform calculations, support 2M point FFT and more than 20 kinds
- Commonly used time domain operations; support custom expressions to realize complex nesting operation
- Various advanced data analysis and processing functions: search and navigation, high-speed mask test, Bode plot, power analysis (option), counter, etc.
- 16 digital channels (option)
- 25 MHz Arbitrary Waveform Generator (Option)
- 10.1 inch capacitive touch screen, resolution 1024*600
- Rich interfaces: SBUS (Siglent logic analyzer interface), 3 USB Hosts, USB Device (USBTMC), LAN
 - VXI-11/Telnet/Socket+SCPI
 - Pass/Fail Trigger Out, etc. support
- external mouse and keyboard operations; built-in WebServer supports Controlling the Instrument via the Web
- Support rich SCPI remote control commands
- Multilingual display and embedded online help

Model and main parameters

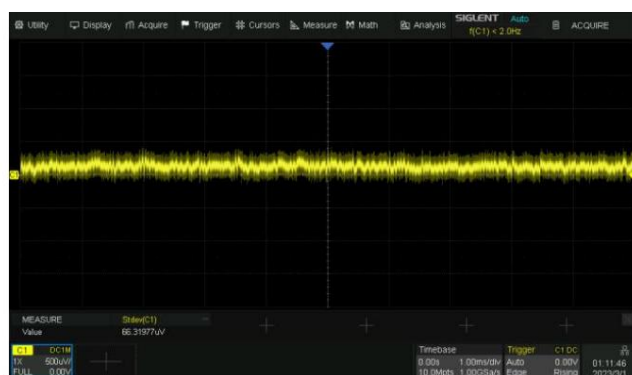
model	SDS1074X HD SDS1072X HD	SDS1104X HD SDS1102X HD	SDS1204X HD SDS1202X HD
number of channels	4+EXT (4-channel series: SDSxxx4X HD) 2+EXT (2-channel series: SDSxxx2X HD)		
bandwidth	70 MHz	100 MHz	200 MHz
Maximum real-time sampling rate (4 channel series)	Single channel mode: 1GSa/s Dual-channel mode (turn on any one of channels 1 and 2, and turn on any one of channels 3 and 4 at the same time): 500MSa/s Other modes: 250MSa/s		
Maximum real-time sampling rate (2-channel series)	Single channel mode: 1GSa/s Dual channel mode: 500MSa/s		
Maximum memory depth	100 Mpts/ch (interleaved mode)		
Waveform capture rate	Normal mode: up to 100,000 wfm/s; Sequence mode: up to 400,000 wfm/s		
vertical resolution	12-bit		
trigger type	Edge, Slope, Pulse width, Window, Runt, Interval, Dropout, Pattern, Video, Serial Line Trigger (IIC, SPI, UART, CAN, LIN)		
Serial triggering and decoding standard	I2C, SPI, UART, CAN, LIN		
Measurement	More than 50 kinds of parameter measurement, and support histogram, trend graph and track graph statistics		
computation	4-channel 2M-point FFT spectrum analysis; addition, subtraction, multiplication, division, integration, differentiation, square root, average, ERES, absolute value, sign, equivalent, negation, logarithm, exponent, interpolation, maximum hold, minimum hold, etc. time domain operations; Support the formula editor to realize complex nested operations		
data analysis and processing tool	Search, navigation, history, mask test, Bode plot, power analysis (optional), counter		
Digital channel (optional)	16 channels, 1GSa/s sampling rate, 10 Mpts/ch storage depth		
USB Arbitrary Waveform Generator (optional)	Single channel, maximum output frequency 25MHz, sampling rate 125MSa/s, waveform length 16kpts, isolated output		
interface	SBUS (Siglent logic analyzer interface), USB 2.0 Host x3, USB 2.0 Device, 10M/100M LAN, External trigger input, auxiliary output (TRIG OUT, PASS/FAIL)		
probe	4 sets/2 sets of passive probe PB470	4 sets/2 sets of passive probe PP510	4 sets/2 sets of passive probe PP215
show	10.1 inch capacitive touch screen, resolution 1024*600		

design feature

High-resolution oscilloscope to meet higher precision test requirements

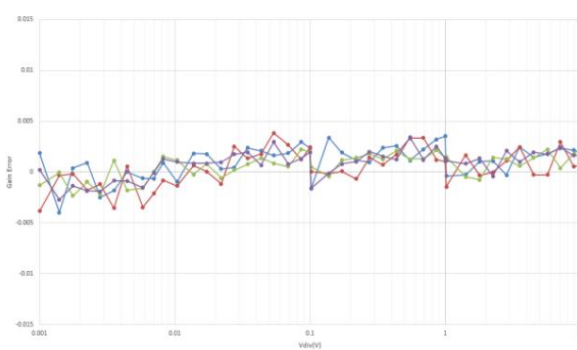


12-bit high-resolution sampling for better presentation of waveform details



Excellent noise floor performance, the noise floor value under the full bandwidth of 200 MHz is only

70 μ Vrms for full performance of 12-bit ADC



0.5% DC Gain Accuracy

Excellent UI and UX



• Equipped with a large 10.1-inch TFT-LCD display with a resolution of 1024*600 • Flat capacitive touch

screen, specially defined for oscilloscope operation

Various gestures, greatly improving the efficiency of instrument control

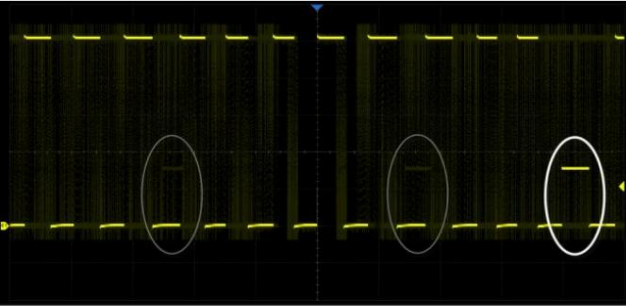
• Embedded WebServer, remote access directly through the webpage

and operating the oscilloscope

• Support mouse and keyboard operation



High refresh rate helps catch exceptions quickly

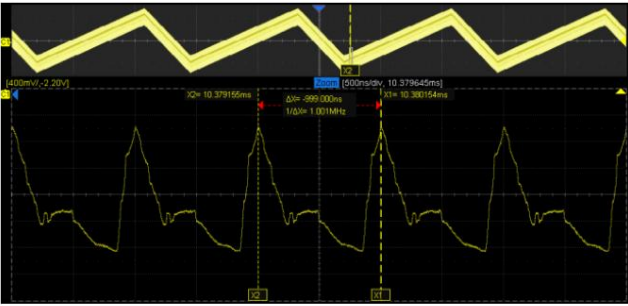


100000 frames per second in normal mode, 400000 in Sequence mode

The frame/second waveform refresh rate enables the oscilloscope to easily capture low-probability anomalies

regular event

Large storage depth takes into account the whole and details

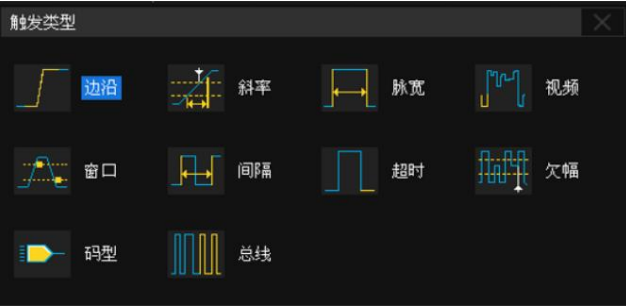


The maximum 100 Mpts/channel deep memory enables users to use higher

sampling rate to capture a longer period of time, combining horizontal and vertical

Zoom function, to achieve both the overall and the details

Rich advanced trigger functions



Rich trigger functions, including edge, slope, pulse width, video,

Window, interval, timeout, runt, pattern, and various bus triggers (serial

trigger)

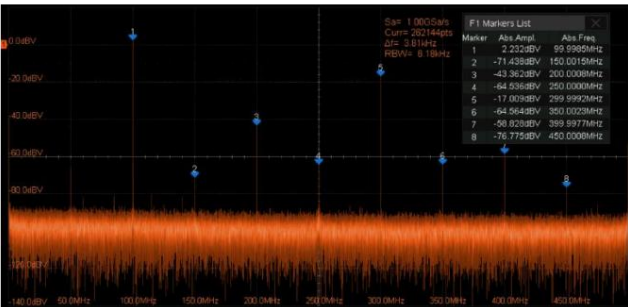
Various math functions



4 independent Math waveforms, supporting more than 20 common mathematical operations,

Support the formula editor to customize the calculation expression, which is used to realize complex embedding

Set of operations



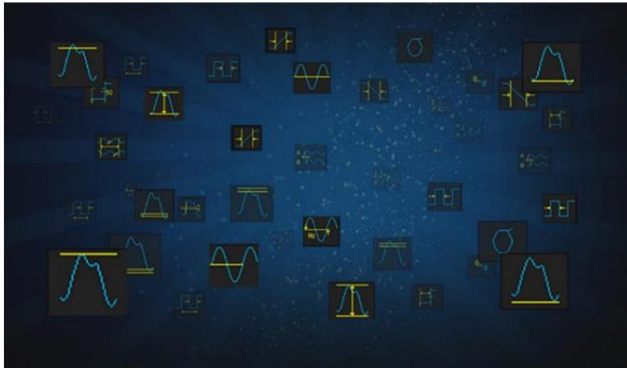
Through the hardware-accelerated FFT function, the maximum operation point is 2M points, which can

maintain a high frequency spectrum refresh rate while providing superior frequency spectrum resolution.

Support a variety of window functions, support normal, average, maximum

Value hold and other modes, support automatic marking of peak points

Rich measurement functions



Measurement types include horizontal, vertical, channel-to-channel delay and hybrid

There are more than 50 kinds of parameters in the quantity category. Measurement sources include analog channels, digital channels

channels, math operations, reference waveforms, historical frames, etc.

Statistical functions for measured parameters



The parameter statistics function can display five measured values of any parameter: current value,

Average value, minimum value, maximum value, standard deviation;

12 different parameters are counted. Histogram statistics can visually display parameters

The probability distribution of the parameter; the trend graph and the trajectory graph can reflect the change of parameters over time

The law of change.

In addition, for the measurement in the horizontal direction (such as period, pulse width, etc.), the traditional

method of obtaining only one measurement value in one frame is abandoned, and all

The measurement values of the specified level items are calculated and included in the statistics, which greatly improves the

High test efficiency

History Mode (History)

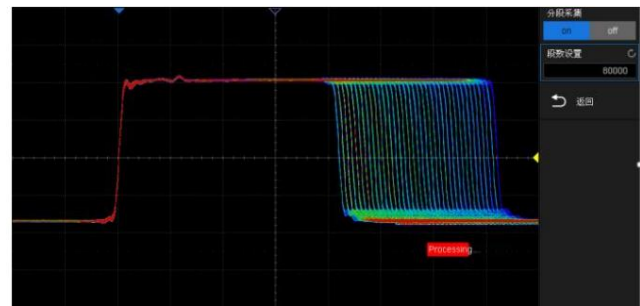


A maximum of 80,000 frames of waveform can be recorded; automatic real-time recording, which can be recalled at any time

Play historical waveforms to observe abnormal events, and use cursors or measurement parameters to quickly

Locate the source of the problem; the failed frame of the template test can be recorded

Segmented acquisition (Sequence)



Segmented acquisition divides the waveform storage space into multiple segments, and each segment stores a

The trigger frame can collect a maximum of 80,000 trigger events, and the interval time between trigger events can

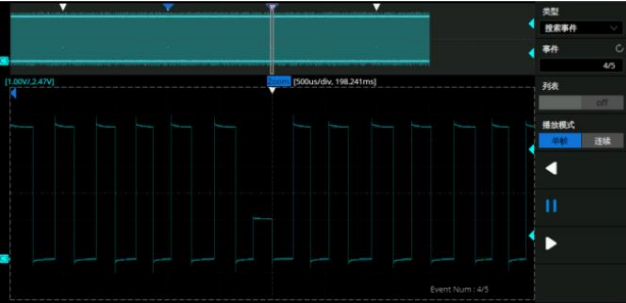
be minimized (as small as 2.5μs) within the Sequence cycle, improving the probability of capturing abnormal events.

All waveform segments acquired in Sequence mode can be

Mapped to the screen, single-frame playback can also be performed through History



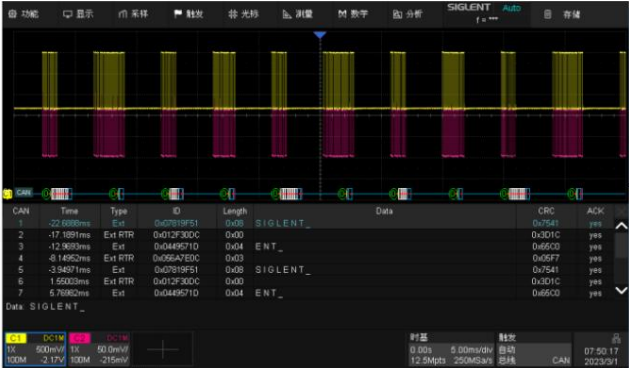
Search and Navigate



By specifying conditions, a frame of waveform is automatically searched, and events that meet the conditions are marked out. Combined with the navigation function, quickly locate the event of interest, and then use the analysis function of the oscilloscope to analyze the event in detail analysis, eliminating the time-consuming and inconvenient manual search. Navigation can search

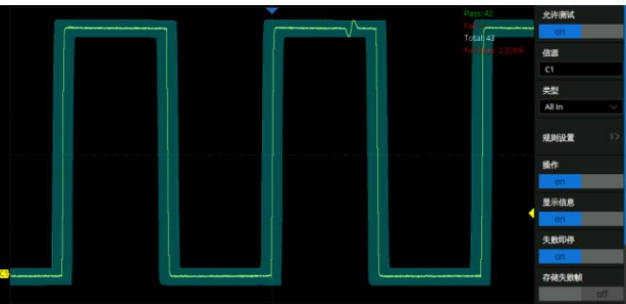
Navigate through events, as well as time and history frames

Serial bus decoding function



Through the event list display decoding, the protocol information of the bus can be quickly and intuitively displayed in the form of a table. Support I2C , SPI, UART, CAN, LIN Multiple Protocols

Hardware-implemented high-speed mask testing

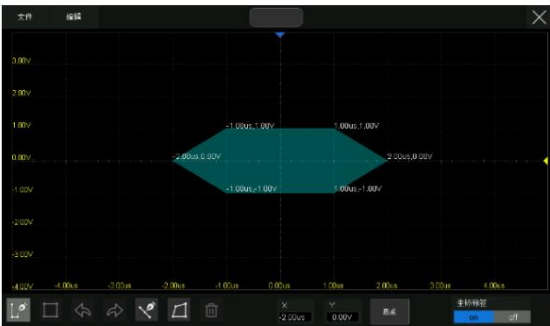


Hardware-based mask testing function, up to 70,000 times per second test. Generate templates based on user-defined vertical and horizontal tolerances, than

Compare whether the signal under test touches the template, if the signal under test touches the template, then measure

If the test fails, the collection stop and the buzzer alarm can be preset when the test fails, and the failed frame will be automatically captured or stored in the history frame, which is suitable for long-term

unattended monitoring of abnormal signals



Embedded Mask Editor tool (optional) for creating and editing user-defined masks

defined template

Bode plot



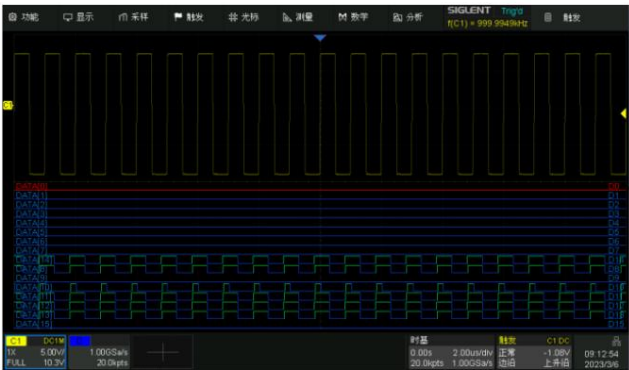
Use the Bode plot to test the frequency response or loop stability of the system, in a certain Field replaces expensive network analyzers. Compatible with optional waveform generators or SDG Series Arbitrary Waveform Generators

Power analysis (optional)



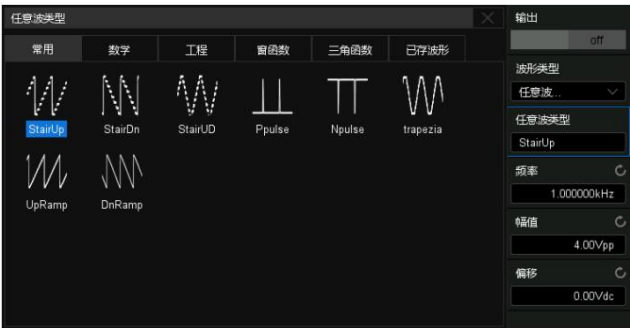
The power analysis option can help users quickly measure and analyze multiple items in the field of power electronics, such as power quality, harmonics, inrush current, switching loss, output ripple, transient response, power supply rejection ratio, power efficiency, etc.

16 digital channels (optional)



Using the 16-way logic analyzer probe SLA1016, 16-way Digital channel acquisition function. Combination of digital and analog channels for mixed signal acquisition and analysis

25MHz USB arbitrary waveform generator (optional)



Access 25MHz USB Arbitrary Waveform Generator via USB Host The module integrates sine wave, square wave, triangle wave, pulse wave, noise, DC and 45 built-in arbitrary waveforms. Users can also edit arbitrary waveforms through EasyWave PC software.

Specifications

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

• The product is within the calibration validity period

• In the range of ambient temperature 18 °C ~ 28 °C, and the instrument works continuously for more than 30 minutes

Acquisition (analog channel)	
Maximum real-time sampling rate (4 channel series)	Single channel mode: 1GSa/s Dual-channel mode (turn on any one of channels 1 and 2, and open any one of channels 3 and 4 at the same time): 500MSa/s Other modes: 250MSa/s
Maximum real-time sampling rate (2-channel series)	Single channel mode: 1GSa/s Dual channel mode: 500MSa/s
memory depth	100 Mpts (interleaved mode)
Waveform capture rate	Normal mode: up to 100,000 wfm/s Sequence mode: up to 400,000 wfm/s
Waveform Intensity Level	256 levels
peak detection	Minimum detectable pulse width 4 ns
Sequence mode	Maximum 80000 frames, minimum two-trigger interval = 2.5µs
History mode	Maximum 80000 frames
interpolation method	sinc/x/y

Vertical (analog channel)	
number of channels	4+EXT (4 channel series) 2+EXT (2 channel series)
Bandwidth (-3dB) @50µs	SDS1074X HD/SDS1072X HD/70 MHz SDS1104X HD/SDS1102X HD/100 MHz SDS1204X HD/SDS1202X HD/200 MHz*1
Bandwidth Flatness @50µs	DC ~ 10% (rated bandwidth): ± 1dB 10% ~ 50% (rated bandwidth): ± 2dB 50% ~ 100% (rated bandwidth): + 2dB/-3dB
bandwidth limit	20 MHz/20MHz ±40%
Rise Time@50µs (Typical)	SDS1074X HD, SDS1072X HD: 5.0ns typical SDS1104X HD, SDS1102X HD: 3.5ns typical SDS1204X HD, SDS1202X HD: 1.8ns typical
Effective number	12-bit
of bits of vertical resolution ENOB *2 (typ.)	8.4-bit
Noise Floor *3 (rms, @50µs, typical, 1 mV/div)	70 µV

Vertical Scale Range	8 grid	
vertical gear	1 M \ddot{y} 0.5 mV/div – 10 V/div	
(probe ratio 1X)	50 \ddot{y} 0.5 mV/div – 1 V/div	
DC Gain Accuracy	0.5 mV/div ~ 4.95 mV/div \ddot{y} 1.5 \ddot{y}	
(typical value)	5 mV/div ~ 10 V/div \ddot{y} 0.5 \ddot{y}	
DC Offset Accuracy	\pm (0.5% DC bias setting + 0.5% full scale + 1 mV)	
offset range (probe ratio 1X)	1 M \ddot{y}	0.5 mV/div ~ 5 mV/div \ddot{y} 1.6 V \ddot{y} 5.1 mV/div ~ 10 mV/div \ddot{y} 4 V \ddot{y} 10.2 mV/div ~ 20 mV/div \ddot{y} 8 V \ddot{y} 20.5 mV/div ~ 100 mV/div \ddot{y} 8 V \ddot{y} 102 mV/div ~ 200 mV/div \ddot{y} 80 V \ddot{y} 205 mV/div ~ 1 V/div \ddot{y} 80 V \ddot{y} 1.02 V/div ~ 10 V/div \ddot{y} 400 V \ddot{y}
	50 \ddot{y}	0.5 mV/div ~ 5 mV/div \ddot{y} 1.6V \ddot{y} 5.1 mV/div ~ 10 mV/div \ddot{y} 4 V \ddot{y} 10.2 mV/div ~ 20 mV/div \ddot{y} 8 V \ddot{y} 20.5 mV/div ~ 10 0mV/div \ddot{y} 8 V
AC Coupling Cutoff Frequency	2 Hz (typical)	
(-3dB) Overshoot (150 ps fast edge @50 \ddot{y} , typical)	8%	
input coupling	DC \ddot{y} AC \ddot{y} GND	
input resistance	1 M \ddot{y} (1 M \ddot{y} \pm 2%) (17 pF \pm 2 pF) 50 \ddot{y} : 50 \ddot{y} \pm 1%	
input voltage	1 M \ddot{y} \ddot{y} 400 Vpk (DC + AC) \ddot{y} DC~10 kHz 50 \ddot{y} \ddot{y} 5V rms	
SFDR (Spurious Free Dynamic Range)	\ddot{y} 35 dBc	
Channel Isolation	DC \ddot{y} Max BW \ddot{y} >40dB	
Probe Attenuation Coefficient	1X, 10X, 100X, custom	

*1: 200 MHz in 1-channel and 2-channel modes, 100 MHz in other modes

*2: 24.99 MHz, -0.25 dBFS input, 20 mV/div steps

*3: Take the standard deviation (Stdev) value of the vertical measurement

level	
horizontal gear	2 ns/div – 1000 s/div
Horizontal scale range	10 grids
display mode	Y-TyX-YyRoll
Roll mode	γ 50 ms/div
channel offset γCH1~CH4γ	< 100 ps
Time Base Accuracy	±25ppm

trigger		
trigger mode	auto, normal, single	
Trigger level range	Channel trigger: ± 4.5 divisions (from zero level position) EXTȳ±0.61 V EXT/5ȳ±3.05 V	
Trigger holdoff range	Time: 8 ns to 30 s (8 ns step)	
Coupling method	AC coupled AC DC coupled DC Low Frequency Rejection LFRJ High Frequency Rejection HFRJ Noise suppression Noise RJ	
Trigger Level Accuracy (typical value)	CH1ȳCH4ȳ± 0.2 div EXTȳ± 0.3 div	
trigger sensitivity	CH1ȳCH4ȳ	DCȳMax BW 0.6div
	EXTȳ	200 mVppȳDCȳ200 MHz
	EXT/5ȳ	1 VppȳDCȳ200 MHz
trigger jitter	CH1ȳCH4ȳ<100ps EXTȳ< 200 ps rms	
trigger displacement	Pre-trigger: 0ȳ100% memory depth Delay trigger: 0ȳ10000 div	
edge trigger		
source	CH1~CH4/EXT/(EXT/5)/AC Line/D0~D15	
trigger edge	Rising edge, falling edge, alternating	
slope trigger		
source	CH1~CH4	
trigger edge	Rising edge, falling edge	
limitation factor	less than, greater than, within range, outside range	
time setting	2 nsȳ20 s, resolution 2ns	
pulse width trigger		

source	CH1~CH4/D0~D15
polarity	Positive pulse width, negative pulse width
limitation factor	Less than, greater than, within range, outside
time setting	range 2 ns~20 s, resolution 2ns
video trigger	
source	CH1~CH4
standard	NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, custom
Synchronize	Arbitrary choice
Triggering conditions	row, field
window trigger	
source	CH1~CH4
window type	absolute, relative
interval trigger	
source	CH1~CH4/D0~D15
trigger edge	rising edge, falling edge
limitation factor	less than, greater than, within, outside of
time setting	2 ns~20 s, resolution 2ns
timeout trigger	
source	CH1~CH4/D0~D15
timeout type	edge, status
Triggering conditions	rising edge, falling edge
time setting	2 ns~20 s, resolution 2ns
runt trigger	
source	CH1~CH4
polarity	Positive pulse width, negative pulse width
limitation factor	Less than, greater than, within range, outside
time setting	range 2 ns~20 s, resolution 2ns
pattern trigger	
source	CH1~CH4/D0~D15
Pattern setting	don't care, low, high
Logic	and, or, and not, or not
limitation factor	Less than, greater than, within range, outside
time setting	range 2 ns~20 s, resolution 2ns
serial bus trigger	
source	CH1~CH4/D0~D15
bus type	Standard: I2C, SPI, UART, CAN, LIN
I2C Trigger	Trigger conditions: start, stop, restart, no response, address + data, EEPROM, data length
SPI trigger	Trigger condition: data

UART trigger	Trigger conditions: start, stop, data, checksum error
CAN trigger	Trigger conditions: start, remote frame, identifier, identifier+data, error
LIN trigger	Trigger conditions: interval, identifier, identifier+data, data error

serial bus decoding	
Number of decodes	2 way
threshold level	-4.5~4.5 div
list line	1~7 rows
I2C decoding	
source	CH1~CH4/D0~D15
Signal	SCL~SDA
address type	7-bit~10-bit
SPI decoding	
source	CH1~CH4/D0~D15
Signal	CLK,MISO,MOSI,CS
clock edge	rising edge, falling edge
Chip Select	Active High, Active Low, Clock Timeout
bit order	Least Significant Bit (LSB), Most Significant Bit (MSB)
UART decoding	
source	CH1~CH4/D0~D15
Signal	Rx~TX
data width	5 bits~6 bits~7 bits~8 bits
Parity	None, Odd bit, Even bit, 1 parity, 0 parity
stop bit	1 bit~1.5 bits~2 bits
idle level	high level, low level
bit order	Least Significant Bit (LSB), Most Significant Bit (MSB)
CAN decoding	
source	CH1~CH4/D0~D15
LIN decoding	
LIN protocol version	Ver 1.3~Ver 2.0
source	CH1~CH4/D0~D15
baud rate	600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, custom

Measurement	
automatic measurement	
source	CH1~CH4YD0~D15YZ1~Z4YF1~F4YRefYHistory
measurement mode	Basic Measurements, Advanced Measurements
Measuring range	screen, gated
Vertical Measurement Parameters	Maximum value, minimum value, peak-to-peak value, amplitude, top value, bottom value, average value, period average value, standard deviation, Period Std Dev, RMS, Period RMS, Median, Period Median, Decline Excessive, Decline Forward, Excessive Rise, Pre-Rise, Level@Trigger
Level Measurement Parameters	Period, frequency, maximum time, minimum time, positive pulse width, negative pulse width, 10-90% rise time, 90-10% Fall Time, Rise Time, Fall Time, Positive Burst Width, Negative Burst Width, Positive Duty Cycle, Negative Duty Cycle, Delay, Time@Middle, adjacent cycle jitter positive area, negative
Mixed measurement parameters	area, effective area, absolute area, AC positive area, AC negative area, AC effective area, AC absolute area, number of cycles, number of rising edges, number of falling edges, total number of edges, number of positive pulses, number of negative pulses, Rising edge slope, falling edge slope
Channel Delay Parameters	Phase, FRFR, FRFF, FFFR, FFFF, FRLR, FRLF, FFLR, FFLF, Delay, Tsu@R, Tsu@FyTh@RyTh@F
measurement statistics	Current value, average value, minimum value, maximum value, standard deviation, statistical times, histogram, trend graph, track graph
cursor measurement	
source	CH1~CH4YD0~D15YF1~F4YRef
cursor type	Manual cursor measurement time (X1, X2), time difference YT Display time difference reciprocal in Hz (1/YT) Manual cursor measurement voltage (Y1, Y2), voltage difference YV Automatic tracking cursor measurement cursor

operation	
aisle	F1YF4
source	CH1~CH4YZ1~Z4YF1~F4
operator	Addition, subtraction, multiplication, division, FFT, derivative, integral (support integral threshold), square root, average, ERES, absolute value, Sign, Identity, Inverse, Logarithm, Exponential, Interpolation, Maximum Hold, Minimum Hold, Equation Editor
FFT	Points: 1K-2M, variable Window Type: Rectangular window, Blackman window, Hanning window, Hamming window, flat top window Display: full screen, half screen, spectrum only Modes: Normal, Max Hold, Averaging Tools: Peak Search, Marker

data analysis	
search	
source	CH1~CH4
model	Edge, slope, pulse width, interval, runt
set up	copy from trigger, copy to trigger
navigation	
type	Search events, time, history frames
template test	
source	CH1~CH4&Z1~Z4
template	Automatically created according to the waveform, user-defined (created through Mask Editor)
mask test rate	Up to 70000 frames per second (point display), 20000 frames per second (line display)
Bode plot	
source	CH1~CH4
signal source	USB Arbitrary Waveform Generator, SDG Series Function/Arbitrary Waveform Generator (Connection: USB, LAN)
scan type	constant amplitude, variable amplitude
frequency	Scan mode: linear, logarithmic Scanning range: 10 Hz ~ 120 MHz
Measurement item	Upper cutoff frequency, lower cutoff frequency, bandwidth, gain margin, phase margin
Power analysis (option)	
analysis item	Power Quality, Current Harmonics, Inrush Current, Switching Loss, Slew Rate, Modulation Analysis, Output Ripple, Turn On/Off, Transient Response, Power Supply Rejection Ratio, Power Efficiency
counter	
source	CH1~CH4
frequency meter	7 digits
counter	Edge counting, support gating, triggering

Digital channel (option)	
Sampling Rate	1GSa/s
storage depth	10 Mpts/ch
Minimum identifiable pulse width	3.3 ns
Threshold level range	-10V~10V
Logic Level Type	TTL, CMOS, LVCMOS3.3, LVCMOS2.5, user-defined between digital channels: ± 1 sampling
channel-to-channel deviation	interval between digital channels and analog channels: $\pm (1 \text{ sampling interval} + 1 \text{ ns})$

USB Arbitrary Waveform Generator (Option)	
Number of channels	1
output frequency	25 MHz
Sampling Rate	125 MSa/s
frequency resolution	1 μ Hz
Frequency Accuracy	± 50 ppm
vertical resolution	14-bit
Output amplitude range	-1.5 V \ddot{y} +1.5 V (50 \ddot{y} load) -3 V \ddot{y} +3 V (high resistance load)
Output Waveform Type	Sine wave, square wave, pulse wave, triangle wave, noise, DC and 45 built-in arbitrary waveforms
output impedance	50 \ddot{y} $\pm 2\%$
Protect	Overvoltage protection, current limiting protection
sine wave	
frequency	1 μ Hz \ddot{y} 25 MHz
Vertical Accuracy (10 kHz)	$\pm (1\% \text{ of setting} + 3 \text{ mVpp}) \pm 0.3$
Amplitude flatness	dB relative to 10 kHz, 5 Vpp
SFDR (Spurious Free Dynamic Range)	DC \sim 1 MHz \ddot{y} -60 dBc 1 MHz \sim 5 MHz \ddot{y} -55 dBc 5 MHz \sim 25 MHz \ddot{y} -50 dBc
HD (Harmonic Distortion)	DC \sim 5 MHz \ddot{y} -50 dBc 5 MHz \sim 25 MHz \ddot{y} -45 dBc
square wave/pulse wave	
frequency	1 μ Hz \ddot{y} 10 MHz
duty cycle	1% \ddot{y} 99%
Rise/fall time $< < 24$ ns (10% to 90%)	
overshoot	$< 3\%$ (typical, 1 kHz, 1 Vpp)
pulse width	> 50 ns
Jitter (cycle-to-cycle) < 500 ps + 10 ppm	
triangle wave	
Frequency Range	1 μ Hz \ddot{y} 300 kHz
Linearity	$< 0.1\%$ of output peak (typical, 1 kHz, 1 Vpp, 50% symmetry)
symmetry	0% \ddot{y} 100%
DC	
voltage offset	± 1.5 V (50 \ddot{y} load) ± 3 V (high resistance load) \pm
Offset accuracy	(setting offset value)*1%+3 mV)
noise	
Bandwidth (-3dB)	> 25 MHz

arbitrary wave	
frequency	1 μ Hz~5 MHz
Arbitrary wave length	16 kpts
Sampling Rate	125 MSa/s
import method	Host computer import, U disk import, channel waveform direct import

interface	
front panel	USB 2.0 Host x 2 \bar{y}
	SBUS: Siglent Logic Analyzer Interface
	Probe calibration signal: 1 kHz, 3 V square wave
rear panel	USB 2.0 Host \bar{y}
	USB 2.0 Device \bar{y}
	LAN: 10M/100M Ethernet interface (RJ45 terminal);
	External trigger input, EXT: \bar{y} 1.5 Vrms, EXT/5: \bar{y} 7.5 Vrms; Auxiliary output: including TRIG
	OUT (3.3 V LVCMOS), PASS/FAIL OUT (3.3 V TTL)

show	
display screen	10.1" color capacitive touch screen
resolution	1024x600
Contrast (Typical)	500:1
Backlight intensity (typical) 500 nit	

display setting	
display range	8 x 10 grid
Waveform display mode	point, vector
Afterglow settings	off, 0.1 sec, 0.2 sec, 0.5 sec, 1 sec, 5 sec, 10 sec, 30 sec, infinite
screen display	normal color temperature
display language	Simplified Chinese, Traditional Chinese, English, French, Japanese, German, Spanish, Russian, Italian, Portuguese Simplified Chinese, English
Built-in help system	

environment	
ambient temperature	Working: 0 \bar{y} ~ +50 \bar{y}
	Non-working: -30 \bar{y} ~ +70 \bar{y}
humidity range	Working: 5% ~ 90% RH, 30 \bar{y} , the upper limit is derated to 50% RH at 50 \bar{y} ,
	Non-working: 5% ~ 95% RH
Altitude	Working: \bar{y} 3,000 m, 25 \bar{y} Non-working:
	\bar{y} 15,000m

electromagnetic compatibility	Comply with EMC directive (2014/30/EU), meet or exceed IEC 61326-1:2012/EN61326-1:2013 (basic requirements)		
	Conducted harassment	CISPR 11/EN 55011	CLASS A group 1 150 kHz-30 MHz
	radiation harassment	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)
	RF 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 2.7 GHz
	electrical fast transient Burst (EFT)	IEC 61000-4-4/EN 61000-4-4	2 kV (AC input port)
	surge	IEC 61000-4-5/EN 61000-4-5	1 kV (line to neutral) 2 kV (live/neutral to ground)
	RF continuous conduction Immunity	IEC 61000-4-6/EN 61000-4-6	3 V 0.15-80 MHz
	voltage sag with short interruption	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 Short breaks: 0% UT during 250/300 cycles
safety regulations	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	Conforms to EU 2015/863		

power supply	
input specifications	100~240 Vrms 50/60 Hz
power	120W max, 70W typical, 4W typical in standby

Mechanical structure	
size	Width x height x thickness = 317.2 mm x 236.0 mm x 149.0 mm (including knobs and support feet)
weight	Net weight 4.1 kg, gross weight 5.6 kg







Ordering Information









Product number	Product Description
SDS1204X HD	4 channels, 200 MHz bandwidth, 1 GSa/s sampling rate
SDS1104X HD	4 channels, 100 MHz bandwidth, 1 GSa/s sampling rate
SDS1074X HD	4 channels, 70 MHz bandwidth, 1 GSa/s sampling rate
SDS1202X HD	2 channels, 200 MHz bandwidth, 1 GSa/s sampling rate
SDS1102X HD	2 channels, 100 MHz bandwidth, 1 GSa/s sampling rate
SDS1072X HD	2 channels, 70 MHz bandwidth, 1 GSa/s sampling rate

Standard accessories	quantity
USB data cable	1
quick guide	One
passive probe	1 set/channel
Calibration certificate	1 copy
power cable	1

Optional accessories	Specifications
Arbitrary Waveform Generator Option (Software) SDS1000XHD-FG	
USB Isolated Arbitrary Waveform Generator Hardware SAG1021I	
16 digital channel software (software)	SDS1000XHD-16LA
16-way logic analyzer hardware	SLA1016
Power Analysis Option (Software)	SDS1000XHD-PA
Phase Calibration Board	DF2001A

Probes and Options

probe	picture	model	Product specification description
passive probe		PB470	70M bandwidth 1X/10X attenuation, 1M/10Mohm, 300V/600V
		PP510	100 MHz bandwidth 1X/10X attenuation, 1M/10Mohm, 300V/600V
		PP215	200 MHz bandwidth 1X/10X attenuation, 1M/10Mohm, 300V/600V
current probe		CP4020	Bandwidth 100KHz, maximum continuous current 20Arms Peak current 60A, switching ratio: 50mV/A, 5mV/A, DC measurement accuracy: 50mV/A (0.4A-10ApK) $\pm 2\%$ 5mV/A (1A-60ApK) $\pm 2\%$, 9V dry battery power supply bandwidth
		CP4050	1MHz, maximum continuous current 50Arms, Peak current 140A, switching ratio: 500mV/A, 50mV/A, DC measurement accuracy: 500mV/A (20mA-14ApK) $\pm 3\% \pm 20mA$ 50mV/A (200mA-100ApK) $\pm 4\% \pm 200mA$ 50mV/A (100A-140ApK) $\pm 15\% \max$ 9V dry battery power supply
		CP4070	Bandwidth 150KHz, maximum continuous current 70Arms, Peak current 200A, switching ratio: 50mV/A, 5mV/A, DC measurement accuracy: 50mV/A (0.4A-10ApK) $\pm 2\%$, 5mV/A (1A-200ApK) $\pm 2\%$, 9V dry battery power supply bandwidth 300KHz,
		CP4070A	maximum continuous current 70Arms, Peak current 200A, switching ratio: 100mV/A, 10mV/A, DC measurement accuracy: 100mV/A (50mA-10ApK) $\pm 3\% \pm 50mA$ 10mV/A (500mA-40ApK) $\pm 4\% \pm 50mA$ 10mV/A (40A-200ApK) $\pm 15\% \max$ 9V dry battery power supply
		CP5030	Bandwidth 50MHz, maximum continuous current 30Arms, Peak current 50A, switching ratio: 100mV/A, 1V/A, AC and DC measurement accuracy: 1V/A ($\pm 1\% \pm 1mA$), 100mV/A ($\pm 1\% \pm 10mA$), standard DC12V/1.2A power adapter

		CP5030A	<p>Bandwidth 100MHz, maximum continuous current 30Arms,</p> <p>Peak current 50A, switching ratio: 100mV/A, 1V/A,</p> <p>AC and DC measurement accuracy:</p> <p>1V/A ($\pm 1\% \pm 1\text{mA}$) \ddot{y} 100mV/A ($\pm 1\% \pm 10\text{mA}$) \ddot{y}</p> <p>Standard DC12V/1.2A power adapter</p>
		CP5150	<p>Bandwidth 12MHz, maximum continuous current 150Arms,</p> <p>Peak current 300A, switching ratio: 100mV/A, 10mV/A,</p> <p>AC and DC measurement accuracy:</p> <p>100mV/A ($\pm 1\% \pm 10\text{mA}$) \ddot{y} 10mV/A ($\pm 1\% \pm 100\text{mA}$) \ddot{y}</p> <p>Standard DC12V/1.2A power adapter</p>
		CP5500	<p>Bandwidth 5MHz, maximum continuous current 500Arms,</p> <p>Peak current 750A, switching ratio: 100mV/A, 10mV/A,</p> <p>AC and DC measurement accuracy:</p> <p>100mV/A ($\pm 1\% \pm 10\text{mA}$), 10mV/A ($\pm 1\% \pm 100\text{mA}$), standard DC12V/1.2A power adapter bandwidth 50MHz, maximum</p>
High voltage differential probe		DPB4080	<p>input differential</p> <p>voltage 800V (DC + Peak AC), range selection (attenuation ratio) 10X/100X, accuracy $\pm 1\%$, standard DC 9V/1A power adapter</p>
		DPB5150	<p>Bandwidth 70MHz,</p> <p>maximum input differential voltage 1500V (DC + Peak AC), range selection (attenuation ratio) 50X/500X, accuracy $\pm 2\%$,</p> <p>Standard 5V/1A USB adapter</p>
		DPB5150A	<p>Bandwidth 100MHz,</p> <p>maximum input differential voltage 1500V (DC + Peak AC), range selection (attenuation ratio) 50X/500X, accuracy $\pm 2\%$,</p> <p>Standard 5V/1A USB adapter</p>
		DPB5700	<p>Bandwidth 70MHz,</p> <p>maximum input differential voltage 7000V (DC + Peak AC), range selection (attenuation ratio) 100X/1000X, accuracy $\pm 2\%$,</p> <p>Standard 5V/1A USB adapter</p>
		DPB5700A	<p>Bandwidth 100MHz,</p> <p>maximum input differential voltage 7000V (DC + Peak AC), range selection (attenuation ratio) 100X/1000X, accuracy $\pm 2\%$,</p> <p>Standard 5V/1A USB adapter</p>

High voltage probe		HPB4010	<p>Bandwidth 40MHz,</p> <p>maximum test voltage: DC 10KV,</p> <p>ACrms$\sqrt{2}$7KV$\sqrt{2}$sine$\sqrt{2}$</p> <p>AC$\sqrt{2}$Vpp$\sqrt{2}$20KV$\sqrt{2}$Pulse$\sqrt{2}$</p> <p>Attenuation ratio 1:1000, test accuracy: $\sqrt{3}$%</p>
isolation channel module		ISFE	<p>Realize isolation between channels of ordinary oscilloscopes, isolation of the measured signal from the ground, use USB 5V power supply, plug and play, the maximum input voltage can reach ± 600Vpk</p>
demo board		STB-3	<p>Output signals include square wave, sine wave, AM signal, fast edge, Pulse, PWM, I 2C, CAN, LIN and other typical signals</p>
USB isolation arbitrary waveform generator		SAG1021I	<p>25 MHz USB isolated arbitrary waveform generator module, integrated sine wave, square wave, triangle wave, pulse wave, noise, DC and 45 built-in arbitrary waveforms, users can also use EasyWave host computer Software Edit Arbitrary Waveform</p>
16 logic Analyzer hardware		SLA1016	<p>Logic analyzer kit, connected via dedicated SBUS interface to SDS1000X HD provides 16 digital channels.</p>
Phase Calibration Board		DF2001A	<p>Accessories for power analysis, calibration of current probes and voltage probes phase.</p>



About Dingyang

SIGLENT is an industry leader in the field of general electronic test and measurement instruments. At the same time, it is also the first A-share listed company in the general electronic test and measurement instrument industry.

In 2002, the founder of Dingyang Technology began to focus on the research and development of oscilloscopes, and successfully developed the first digital oscilloscope in 2005. After years of development, Dingyang products have been extended to digital oscilloscopes, handheld oscilloscopes, function/arbitrary waveform generators, spectrum analyzers, vector network analyzers, RF/microwave signal sources, desktop multimeters,

Basic test and measurement instrument products such as DC power supply and electronic load are among the few in the world that can simultaneously develop and produce

Production and sales of digital oscilloscopes, signal generators, spectrum analyzers and vector network analyzers

One of the main product manufacturers of testing and measuring instruments, a national key "little giant" enterprise. At the same time, it is also one of the few major domestic competitors that owns these four major products at the same time, and all four major products have entered the high-end market.

Manufacturers in the end field. The company is headquartered in Shenzhen, and has established subsidiaries in Cleveland, USA and Augsburg, Germany.

SIGLENT has established a branch in Chengdu, and its products are exported to more than 80 countries and regions around the world. SIGLENT has become a world-renowned brand of test and measurement instruments.


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