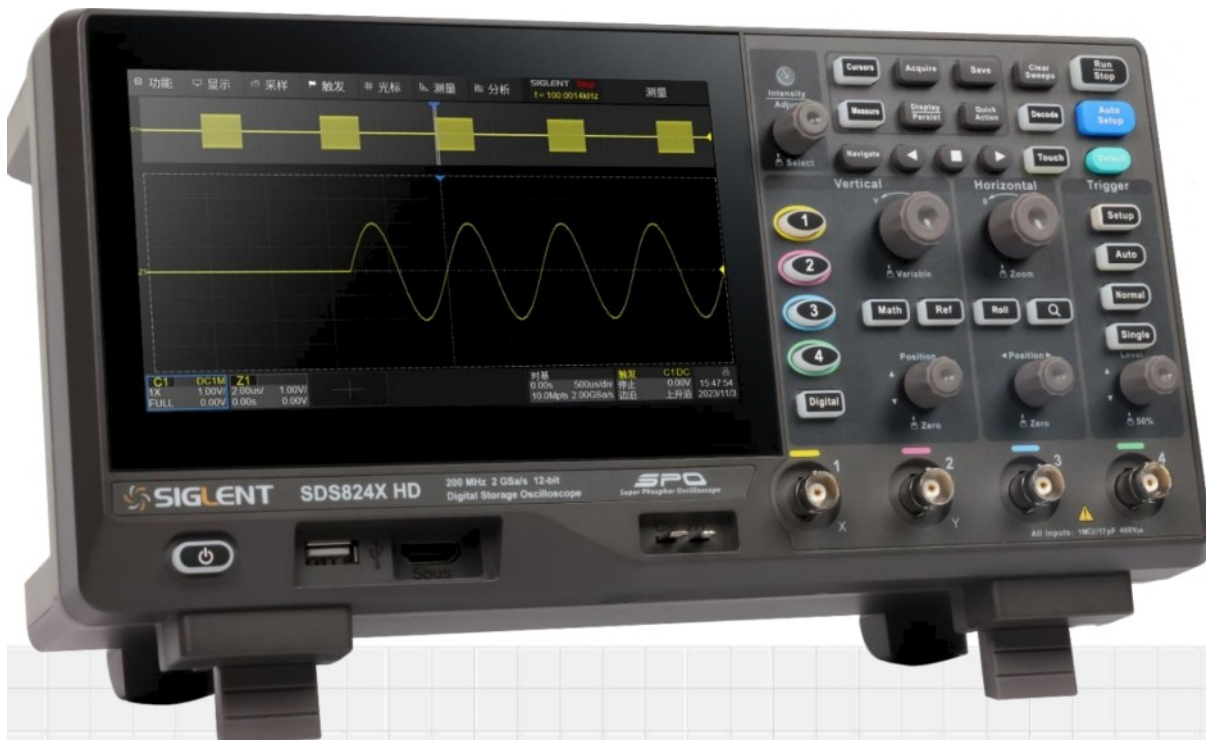


SDS800X HD digital oscilloscope

data sheet

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sds804x hd
sds814x hd
sds824x hd












sds802x hd
sds812x hd
sds822x hd

Product Overview








The SDS800X HD series of high-resolution digital oscilloscopes features the highest 12-bit vertical resolution, excellent noise floor performance, and vertical measurement accuracy to meet the needs of higher precision measurements. The SDS800X HD has a maximum bandwidth of 200 MHz, a maximum sampling rate of 2 GSa/s, 2/4 analog and 16 digital channels, and a memory depth of up to 100 Mpts. SDS800X HD adopts SPO technology with waveform capture rate up to 500,000 frames/sec, 256 levels of glow level and color temperature display; innovative digital trigger system with high trigger sensitivity and low trigger jitter; supports rich intelligent triggering, serial bus triggering and decoding; and supports history and data acquisition.

(SDS800X HD adopts a 7-inch capacitive touch screen, which supports various gestures to realize common operations on waveforms and menus, and combines with multiple one-touch operation buttons on the front panel to greatly optimize the efficiency of operating the oscilloscope and enhance the user experience. Combined with the multiple one-button operation buttons on the front panel, it greatly optimizes the efficiency of operating the oscilloscope and enhances the user experience.

Features and Benefits

-  Analog channel bandwidth: up to 200 MHz; real-time sampling rates up to 2 GSa/s
-  Vertical resolution: 12-bit
-  Low noise floor, down to 70 μVrms at 200 MHz full bandwidth  SPO Technology
 - Waveform capture rates up to 500,000 frames per ~~second~~ (Sequence) (Normal mode) 120,000 frames/second (Normal mode)
 - Supports 256 levels of waveform brightness and color temperature display.
 - Storage depth up to 100 Mpts
 - digitally triggered
-  Smart Trigger: Edge, Slope, Pulse Width, Window, Under Amplitude, Interval, Timeout, Code Pattern, Video Trigger (HDTV supported), Pre-Edge, Nth Edge, Delay, Build/Hold Time
-  Serial bus triggering and decoding, supported protocols include I2C, SPI, UART, CAN, LIN as standard
-  The Sequence mode, which divides the storage depth into a maximum of 80,000 segments, captures qualified events in very small dead time segments based on user-set trigger conditions.
-  History mode, records up to 80,000 frames of waveforms
-  Dozens of automatic measurement functions, support measurement statistics, Gating measurement, Math measurement, History measurement, Ref measurement. Support histogram and trend statistics of measurement parameters.
-  4 independent waveform operations, supporting 2M-point FFT and more than 20 common time-domain operations; supports customized expressions to achieve complex nested operations
-  Multiple advanced data analysis and processing functions: search and navigation, high-speed template test, baud plot, power analysis

(optional) counters, etc.

-  16 digital channels (option)
 -  25 MHz arbitrary waveform generator (option)
 -  7-inch capacitive touchscreen display with 1024*600 resolution
 -  Rich interfaces: SBUS (Siglent Logic Analyzer Interface), 2 USB Host, USB Device, LAN, Pass/Fail, Trigger Out, etc.
 -  Supports external mouse and keyboard operation; built-in WebServer for controlling the instrument via web page; supports NTP (Network Time Protocol).
 -  Supports rich SCPI remote control commands 
- Multi-language display and
embedded online help

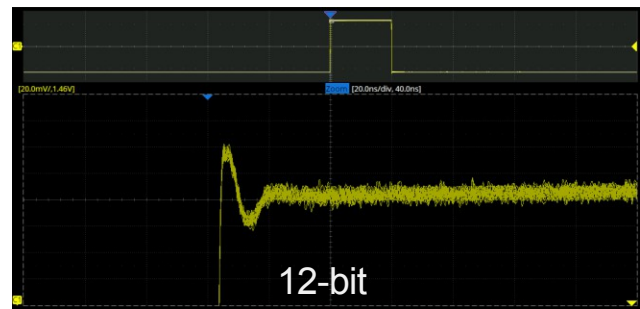
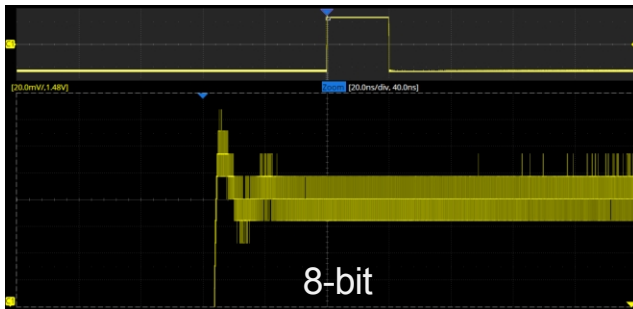
Model and main parameters

model number	sds804x hd sds802x hd	sds814x hd sds812x hd	sds824x hd sds822x hd
channel number	4 (4-channel series) 2 (2-channel series)		
bandwidths	70 MHz	100 MHz	200 MHz
Maximum real-time sampling rate	Single-channel mode: 2 GSa/s Dual-channel mode: 1 GSa/s Quad mode: 500 MSa/s		
Maximum storage depth	Single channel mode: 50 Mpts/ch Dual channel mode: 25 Mpts/ch Quad mode: 10 Mpts/ch		Single channel mode: 100 Mpts/ch Dual channel mode: 50 Mpts/ch Quad mode: 25 Mpts/ch
Waveform capture rate	Normal mode: up to 80,000 wfm/s; Sequence mode: up to 500,000 wfm/s		Normal Mode: Up to 120,000 wfm/s; Sequence Mode: Up to High 500,000 wfm/s
vertical resolution	12-bit		
Trigger Type	Edge, Slope, Pulse width, Window, RunTime Interval, Dropout, Pattern, Video, Premise Edge (Qualified, Nth edge, Delay, Setup/Hold, and Nth edge. time), serial trigger		
Serial Trigger and Decode	Standard: I2C, SPI, UART, CAN, LIN		
surveying	Over 50 parameter measurements with histogram, trend and trajectory statistics support		
mathematical operation	4-way; 2M-point FFT spectrum analysis; digital filtering; addition, subtraction, multiplication, division, integration, differentiation, square root, averaging, ERES, absolute value, sign, equivalence, inversion, logarithmic, exponential, interpolation, maximum hold, minimum hold, and other time-domain operations Calculation; support formula editor to realize complex nested operations		
Data analysis and Processing tools	Search, navigation, history, template test, baud graph, power analysis (optional) counters		
Digital channels (optional)	16 channels, 1GSa/s sample rate, 10 Mpts/ch memory depth		
USB Arbitrary Waveform Generator (optional)	Single channel, maximum output frequency 25MHz, sampling rate 125MSa/s, waveform length 16kpts, isolated output		
connector	SBUS (Siglent Logic Analyzer Interface), USB 2.0 Host x2, USB 2.0 Device, 10M/100M LAN. Auxiliary output (TRIG OUT, PASS/FAIL)		

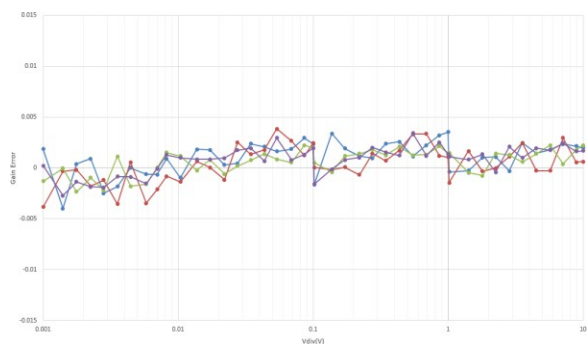
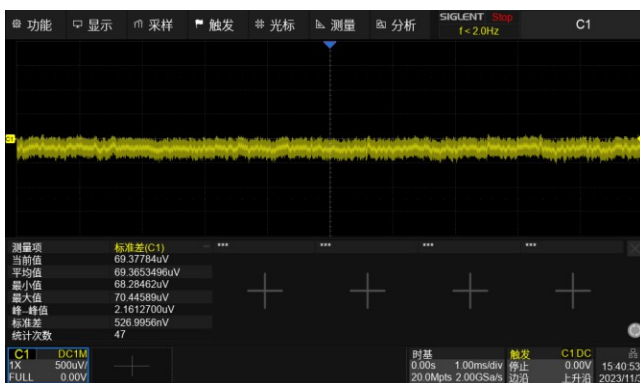
extend one's head (out or into)	4 sets/2 sets of passive probes PB470	4 sets/2 sets of passive probes PP510	4 sets/2 sets of passive probes PP215
demonstrate	7-inch capacitive touchscreen display with 1024*600 resolution		

Design Features

High-resolution oscilloscopes for higher precision testing needs



12-bit high-resolution sampling, superimposed horizontal and vertical Zoom function, taking into account the overall waveform and detail observation



Excellent noise floor performance, with a noise floor of only 70 μ Vrms at 200 MHz full bandwidth, allowing 12-bit ADCs to fully utilize their performance

0.5% DC gain accuracy

Excellent user interface and user experience

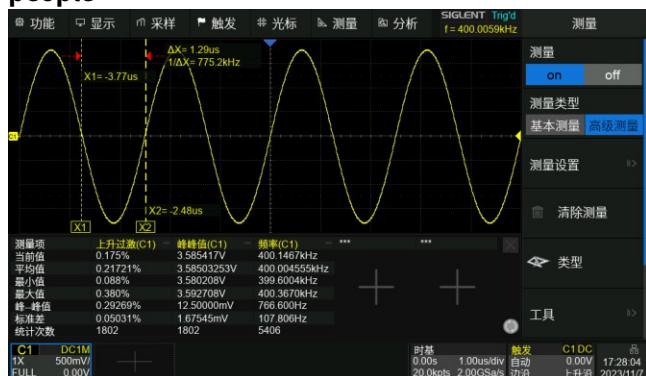


- Large 7-inch TFT-LCD display with resolution 1024*600
- Flat capacitive touch screen with various gestures defined specifically for oscilloscope operation, which greatly improves the efficiency of the instrument control.
- Embedded WebServer for remote access and operation of the oscilloscope directly

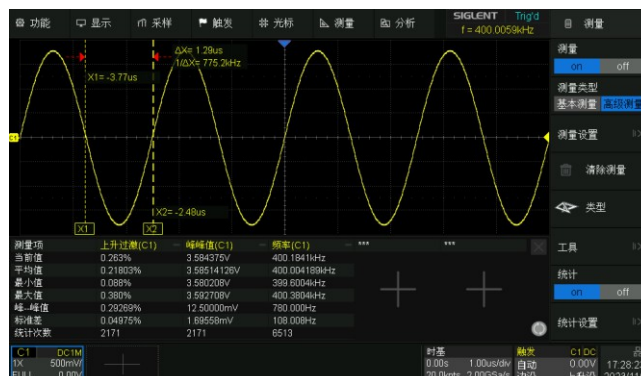
through the web page

- Supports mouse and keyboard operation

User interface size and font size can be selected to meet the observation needs of different groups of people

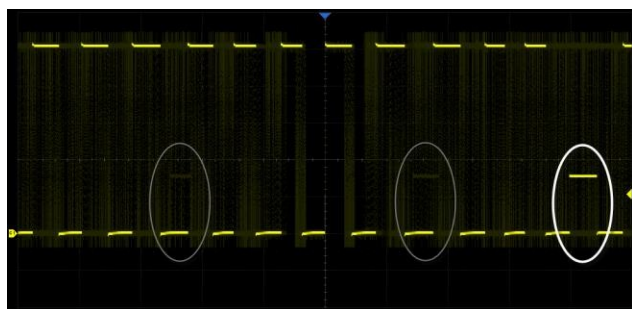


Large font size for use on equipment



Small font size, exquisite display, suitable for VNC and other large screen display scenarios

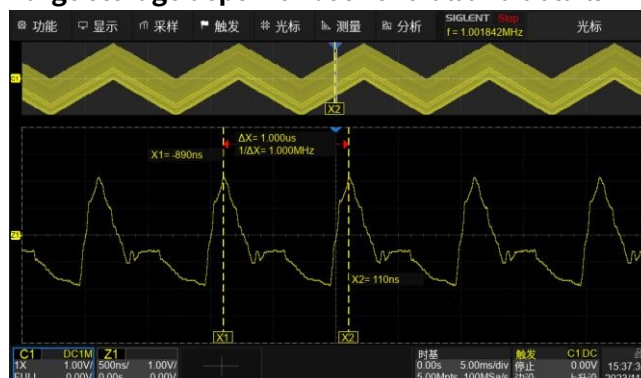
High refresh rate helps to catch anomalies quickly



120,000 fps in normal mode, 500,000 in Sequence mode.

Waveform refresh rate of frames per second enables the oscilloscope to easily capture low-probability anomalous events

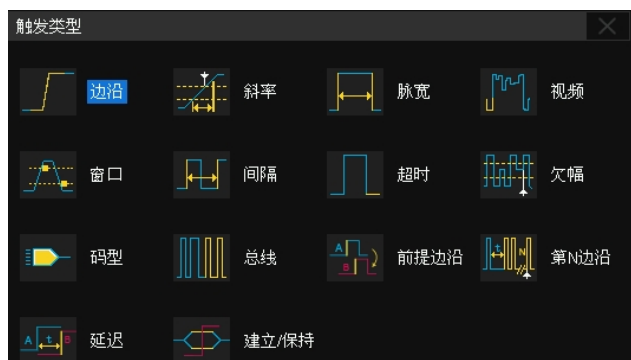
Large storage depth for both overall and details



Deep storage of up to 100 Mpts/channel enables users to use higher

Capture longer signals at sample rates, combined with horizontal and vertical zoom for a balance of overall detail

Rich Advanced Trigger Functions



With rich trigger functions, including edge, slope, pulse width, and video,
Window, interval, timeout, under-amplitude, code type, premise edge, Nth edge,
Delay, build/hold time and multiple bus triggers (serial trigger)

Multiple math functions



4 independent Math waveforms supporting over 20 common math operations.

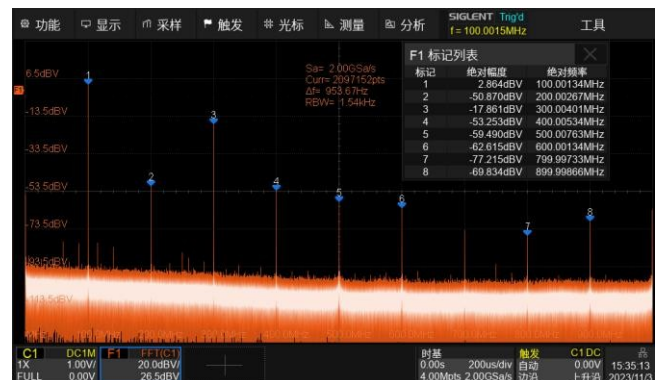
Supports formula editor to customize arithmetic expressions for implementing complex nested arbitrage

Rich measurement functions



Measurement types include horizontal, vertical, inter-channel delay and hybrid.

There are over 50 parameters in total. Measurement sources include analog channels, digital channels Channel, math operations, reference waveforms, history frames, etc.



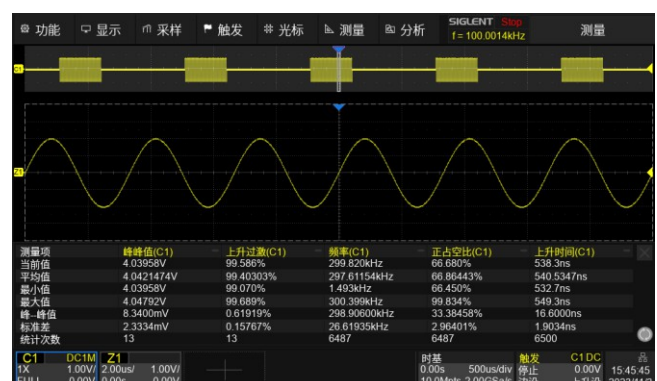
The maximum number of points is 2M points with the hardware accelerated FFT function.

Provides superior spectral resolution while still maintaining high

Spectrum refresh rate. Supports a variety of window functions, supports normal, average, maximum

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

Statistical functions for measured parameters



The parameter statistics function displays five measured values for any parameter: the current value, Mean, Minimum, Maximum, Standard Deviation.

Histogram statistics can straight

The probability distributions of the parameters are displayed visually; trend and trajectory plots respond to the

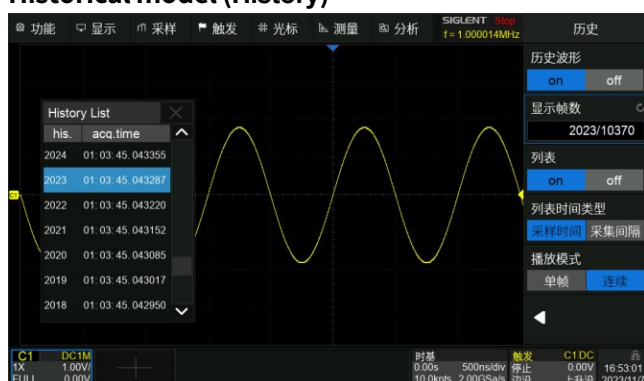
The pattern of variation of parameters over time.

In addition, for measurements in the horizontal direction (e.g., period, pulse width, etc.) the abandonment of the

The traditional method of obtaining only one measurement in a frame takes all of the Measurements for the specified level items are

calculated and included in the statistics, greatly
improving
Increased testing efficiency

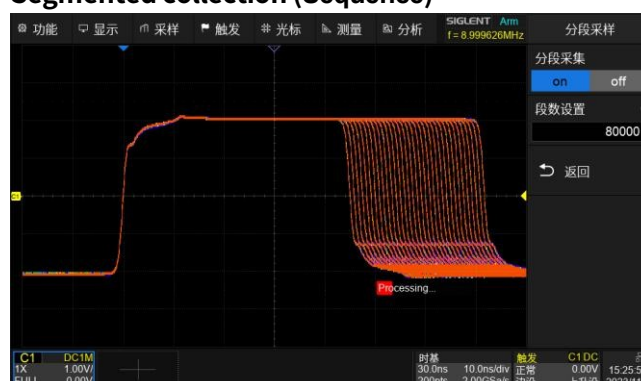
Historical model (History)



Record up to 80,000 frames of waveforms; automatic real-time recording, ready to go back at any time

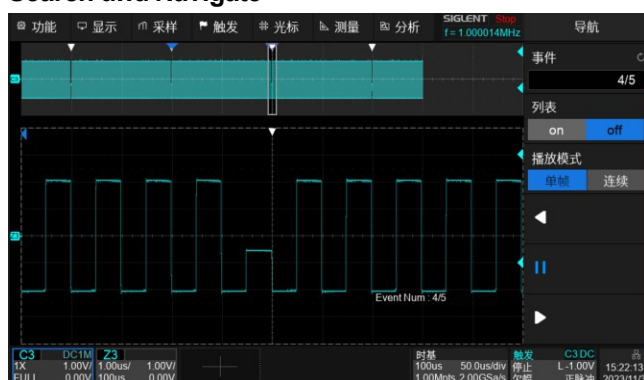
Play historical waveforms to observe anomalous events and quickly locate the source of the problem with a cursor or measured parameter.

Segmented collection (Sequence)



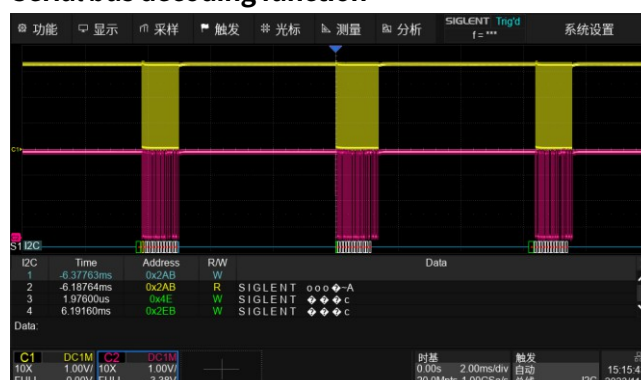
Segmented acquisition divides the waveform storage space into multiple segments, each of which stores a Trigger frames, up to 80,000 trigger events can be captured, and the interval time between trigger events can be minimized (as small as 2μs) to increase the probability of capturing abnormal events. All waveform segments captured in Sequence mode can be mapped to the screen at one time, and can also be played back in a single frame via History.

Search and Navigate



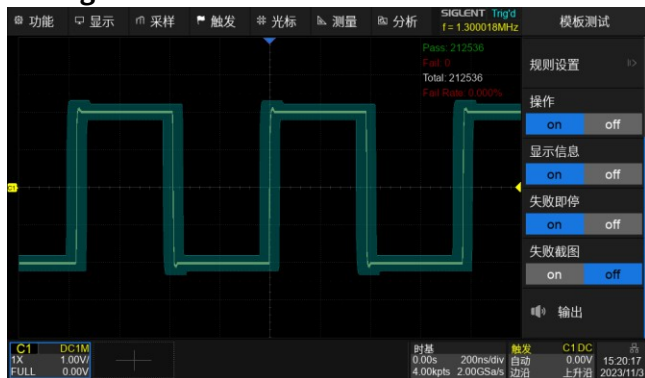
Automatically search a waveform frame by specifying the conditions and identify the events that meet the conditions. Combined with the navigation function, it quickly locates the event of interest and then analyzes the event in detail with the help of the oscilloscope's analysis function, eliminating the time-consuming and inconvenient manual search. Navigation can be used for searching. Navigate through events, but also through time and history frames.

Serial bus decoding function



With the event list display decoding, the protocol information of the bus can be quickly and intuitively displayed in table form. Supports I2C, SPI, UART, CAN and LIN protocols.

Hardware-implemented high-speed template testing



Hardware-based template test function with up to 80,000 executions per second

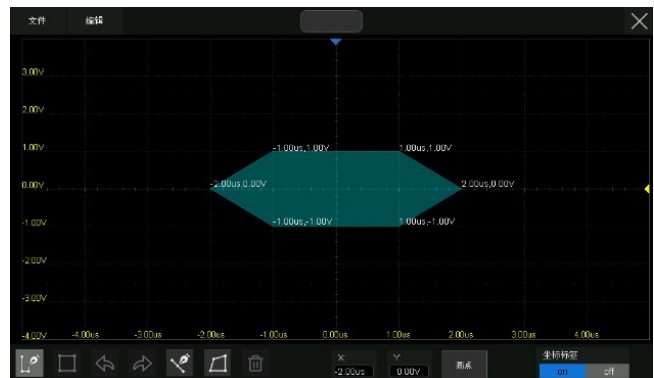
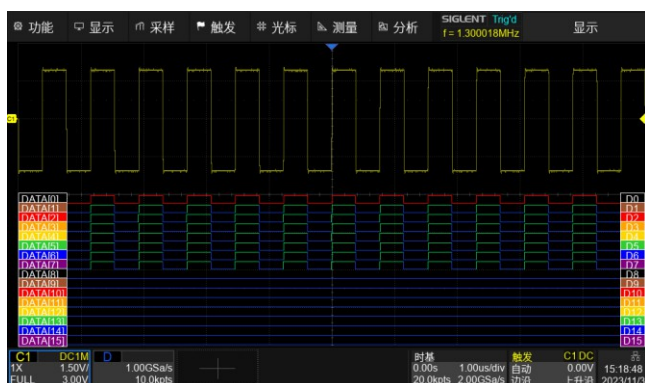
Testing for long-term unattended monitoring of anomalous signals

baud diagram



Utilizing a baud plot to test the frequency response or loop stability of a system at a certain
Replaces expensive network analyzers in the field. Can be used with waveform generator options or the SDG Series Arbitrary Waveform Generator

16 digital channels (optional)



The embedded Mask Editor tool (optional) is used to create and edit user-defined masks.

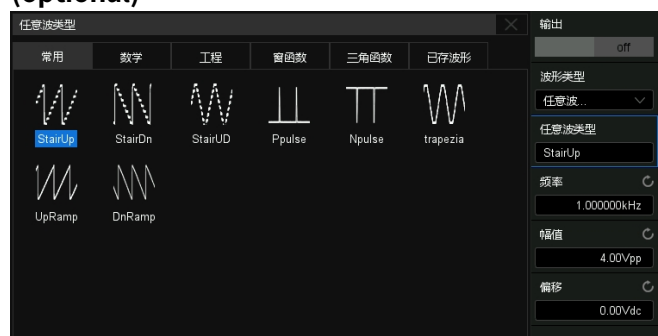
Defined templates

Power analysis (optional)



Power analysis options help users to quickly measure and analyze power electronics.
Multiple items in the domain, such as power quality, harmonics, inrush current, switching losses, output ripple, transient response, power supply rejection ratio, power efficiency, etc.

25MHz USB Arbitrary Waveform Generator (optional)



The 16-channel Logic Analyzer Probe SLA1016 enables 16-channel digital acquisition. Combine digital and analog channels for mixed-signal acquisition and analysis

Access the 25MHz USB Arbitrary Waveform Generator module via USB Host, which integrates sine, square, triangle, pulse, noise, DC, and 45 built-in arbitrary waveforms, or users can access the module via EasyWave.

The upper computer software edits the arbitrary waveform.

Parameter specifications

Unless otherwise noted, all specifications are required when the following conditions are guaranteed to be met:

- Product is within calibration validity
- In the ambient temperature range of 18 °C ~ 28 °C, and the instrument works continuously for more than 30 minutes.

Acquisition (analog channels)		
Maximum real-time sampling rate	Single-channel mode: 2 GSa/s Dual-channel mode: 1 GSa/s Quad mode: 500 MSa/s	
Storage depth	70M and 100M models: Single channel mode: 50 Mpts/ch Dual channel mode: 25 Mpts/ch Quad mode: 10 Mpts/ch	200M models: Single channel mode: 100 Mpts/ch Dual channel mode: 50 Mpts/ch Quad mode: 25 Mpts/ch
Waveform capture rate	70M and 100M models: Normal mode: up to 80,000 wfm/s Sequence mode: up to 500,000 wfm/s	200M models: Normal mode: up to 120,000 wfm/s Sequence mode: up to 500,000 wfm/s
Waveform Glow Levels	256 levels	
peak detection	Minimum detectable pulse width 2 ns	
Sequence Mode	Maximum 80,000 frames, Minimum two trigger intervals = 2μs	
History Mode	Maximum 80,000 frames	
Interpolation	sinx/x, x	

Vertical (analog channels)	
channel number	4 (4-channel series) 2 (2-channel series)
Bandwidth (-3dB) @50fi*1	SDS804X HD, SDS802X HD: 70 MHz SDS814X HD, SDS812X HD: 100 MHz SDS824X HD, SDS822X HD: 200 MHz
Bandwidth flatness @50fi	DC ~ 10% (nominal bandwidth): ± 1dB 10% ~ 50% (nominal bandwidth): ± 2dB 50% ~ 100% (nominal bandwidth): + 2dB/-3dB
bandwidth limit	20 MHz: 20 MHz ±40%.
Rise time @50fi (typical)	SDS804X HD, SDS802X HD: 5.0ns typical SDS814X HD, SDS812X HD: 3.5ns typical SDS824X HD, SDS822X HD: 1.8ns typical
vertical resolution	12-bit

Effective number of bits ENOB *2 (typical values)	8.4-bit
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Noise floor ^{*3} (rms, @50fi. Typical, 1 mV/div)	70 μ V (full bandwidth)	
Vertical Scale Range	8 (classical) obstruct	
vertical gear (Probe ratio 1X)	1 M Ω : 0.5 mV/div - 10 V/div	
DC Gain Accuracy (typical values)	0.5 mV/div ~ 4.95 mV/div: $\pm 1.5\%$; 5 mV/div ~ 10 V/div: $\pm 0.5\%$;	
DC Offset Accuracy	\pm (0.5% DC bias setting + 0.5% full scale + 1 mV)	
offset range (Probe ratio 1X)	1 M 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 ~ 100 mV/div: ± 8 V; 102 mV/div ~ 200 mV/div: ± 80 V; 205 mV/div ~ 1 V/div: ± 80 V; 1.02 V/div ~ 10 V/div: ± 400 V;
AC coupling cutoff frequency (- 3dB)	2 Hz (typical)	
Overshoot (150 ps fast edge. @50fi, typical)	10%	
Input coupling	DC, AC, GND	
Input Impedance	1 M Ω : (1 M Ω $\pm 2\%$) (17 pF ± 2 pF)	
Maximum Input Voltage	1 Mfi \leq 400 Vpk (DC + AC), DC~10 kHz	
SFDR (no spurious dynamic range)	≥ 35 dBc	
Channel Isolation	DC to Max BW: >40dB	
Probe attenuation coefficient	1X, 10X, 100X, Customized	

*1: SDS800X HD without built-in 50 Ω , @50fi in the table means external 50fi

*2: 24.99 MHz, -0.25 dBFS input, 20 mV/div pitch, 50 Ω input impedance

*3: Standard deviation (Stdev) value of vertical measurements taken

level (of achievement etc)	
horizontal gear	70M and 100M models: 2 ns/div - 1000 s/div 200M models: 1 ns/div - 1000 s/div
Horizontal scale range	10 Grams.
display mode	Y-T, X-Y, Roll
Roll mode	≥ 50 ms/div
channel offset (CH1~CH4)	< 100 ps
time base accuracy	± 25 ppm

trig	
Trigger Mode	Automatic, Normal, Single
Trigger Level Range	Channel Trigger: ± 4.5 frames (from zero level position)
Trigger release range	Time: 8 ns to 30 s (8 ns step)
coupling method	AC coupling AC DC coupling DC low frequency rejection LFRJ high frequency rejection HFRJ Noise Suppression Noise RJ
Trigger level accuracy (typical values)	CH1~CH4: ± 0.2 div
Trigger Sensitivity	CH1 to CH4: DC to Max BW 0.6div
Trigger jitter	CH1~CH4: <100ps
triggered displacement	Pre-trigger: 0 to 100% memory depth Delayed trigger: 0~10000 div
edge triggering	
root	CH1~CH4/ AC Line/D0~D15
trigger edge	Rising edge, falling edge, alternating
Slope Trigger	
root	CH1~CH4
trigger edge	Rising Edge, Falling Edge
restrictive condition	Less than, greater than, in range, out of range

time setting	2 ns to 20 s, resolution 1ns
pulse width trigger	
root	CH1~CH4/D0~D15
polarities	Positive Pulse Width, Negative Pulse Width
restrictive condition	Less than, greater than, in range, out of range
time setting	2 ns to 20 s, resolution 1ns

video trigger	
root	CH1~CH4
(an official) standard	NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, Customized
synchronization	Arbitrary, select
trigger condition	OK, let's do it.
window triggering	
root	CH1~CH4
Window Type	Absolute, relative
delayed trigger	
root	CH1~CH4/D0~D15
trigger edge	Rising Edge, Falling Edge
restrictive condition	Less than, greater than, in range, out of range
time setting	2 ns to 20 s, resolution 1ns
timeout trigger	
root	CH1~CH4/D0~D15
Timeout type	Edge, State
trigger condition	Rising Edge, Falling Edge
time setting	2 ns ~ 20 s, resolution 1ns
under amplitude trigger	
root	CH1~CH4
polarities	Positive Pulse Width, Negative Pulse Width
restrictive condition	Less than, greater than, in range, out of range
time setting	2 ns to 20 s, resolution 1ns
Code Trigger	
root	CH1~CH4/D0~D15
Code Setting	No concern, low, high
logical relation	with, or, with or without
restrictive condition	Less than, greater than, in range, out of range
time setting	2 ns to 20 s, resolution 1ns
Prerequisite Edge Trigger	
typology	Level, Level and Time Limit, Edge, Edge and Time Limit
premise sth.	CH1~CH4
edge trigger source	CH1~CH4
Nth edge trigger	
root	CH1~CH4
slope	Rising Edge, Falling Edge
free time	8 ns to 20 s, resolution 1 ns
number of edges	1 to 65535

delayed trigger	
Source A	CH1~CH4
Source B	CH1~CH4
slope	Rising Edge, Falling Edge
restrictive condition	Less than, greater than, in range, out of range
time setting	2 ns to 20 s, resolution 1ns
Serial Bus Trigger	
root	CH1~CH4/D0~D15
Bus Type	Standard: I2C, SPI, UART, CAN, LIN
I2C Trigger	Trigger conditions: Start, Stop, Restart, No Answer, 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 to 4.5 div
table row	1-7 rows
I²C decoding	
root	CH1~CH4/D0~D15
code	SCL, SDA
Address Type	7-bit, 10-bit
SPI decoding	
root	CH1~CH4/D0~D15
code	clk, miso, mosi, cs
clockwise direction	Rising Edge, Falling Edge
film selection	High Valid, Low Valid, Clock Timeout
order of precedence	Least Significant Bit (LSB), Most Significant Bit (MSB)
UART decoding	
root	CH1~CH4/D0~D15
code	RX, TX
data width	5 bits, 6 bits, 7 bits, 8 bits
parity check	None, odd bits, even bits, 1 parity, 0 parity
stop bit	1 bit, 1.5 bits, 2 bits
idle level	High Level, Low Level
order of precedence	Least Significant Bit (LSB), Most Significant Bit (MSB)

CAN decoding	
root	CH1~CH4/D0~D15
LIN decoding	
LIN Protocol Version	Ver 1.3, Ver 2.0
root	CH1~CH4/D0~D15
baud	600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, Customized

surveying	
automatic measurement	
root	CH1~CH4, D0~D15, Z1~Z4, F1~F4, Ref, History
measurement mode	Basic Measurement, Advanced Measurement
Measurement range	Screen, Door Controls
Vertical measurement parameters	Maximum, Minimum, Peak, Magnitude, Top, Bottom, Mean, Periodic Mean, Standard Deviation, Periodic Standard Deviation, Root Mean Square, Periodic Root Mean Square, Median, Periodic Median, Decline Over-excitement, Decline Pre-excitement, Upward overshooting, upward pre-shooting, Level@Trigger
Horizontal 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
Mixed Measurement Parameters	Positive Area, Negative 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, Slope along the rise, slope along the fall
Channel Delay Parameters	Phase, FRFR, FRFF, FFFR, FFFF, FRLR, FRLF, FFLR, FFLF, time lag, Tsu@R, Tsu@F, Th@R, Th@F
Measurement statistics	Current value, mean, minimum, maximum, standard deviation, number of counts, histogram, trend graph, trajectory graph
cursor measurement	
root	CH1~CH4, D0~D15, F1~F4, Ref.
Cursor Type	Manual cursor measurement of time (X1, X2), time difference ΔT Display of time difference inverse in Hz ($1/\Delta T$) Manual cursor measurement of voltage (Y1, Y2), voltage difference ΔV automatic tracking of the cursor measuring cursor

(mathematical) operation	
conduit	F1~F4
root	CH1~CH4, Z1~Z4, F1~F4
operator (math.)	Add, Subtract, Multiply, Divide, FFT, Filter, Derivative, Integral (supports integral thresholds) Square, Average, ERES, Absolute Value, Sign, Constant, Opposite, Logarithmic, Exponential, Interpolation, Maximum Hold, Minimum Hold, Formula Editor

FFT	<p>Number of points: 1K-2M, variable</p> <p>Window types: rectangular window, Blackman window, Hanning window, Hemming window, flat top window</p> <p>Display: full screen, half screen, spectrum only</p> <p>Mode: Normal, Maximum Hold, Average</p> <p>Tools: peak search, tagging</p>
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data analysis	
look for sth.	
root	CH1~CH4
paradigm	Edge, Slope, Pulse Width, Interval, Under Amplitude
set up	Copy from trigger, copy to trigger
navigator	
typology	Search events, time, history frames
Template testing	
root	CH1~CH4, Z1~Z4
templates	Automatically created from waveforms, user-defined (created via Mask Editor)
Template test rate	Up to 80,000 fps (dot display) 20,000 fps (line display)
baud diagram	
root	CH1~CH4
signal source	USB Arbitrary Waveform Generator, SDG Series Function/Arbitrary Waveform Generator (Connection: USB, LAN)
Scan Type	Constant amplitude, variable amplitude
frequency	Scanning modes: linear, logarithmic Scanning range: 10 Hz ~ 120 MHz
measurement term	Upper Cutoff Frequency, Lower Cutoff Frequency, Bandwidth, Gain Margin, Phase Margin
Power analysis (option)	
analysis term	Power Quality, Current Harmonics, Inrush Current, Switching Losses, Conversion Rates, Modulation Analysis, Output Ripple, On/Off. Transient Response, Power Rejection Ratio, Power Efficiency
register	
root	CH1~CH4
frequency meter	7-bit
register	Edge counting, supports gating, triggering

Digital channels (option)	
sampling rate	1GSa/s
Storage depth	10 Mpts/ch
Minimum recognizable pulse width	3.3 ns
Threshold Level Range	-8 V~8 V
Logic Level Type	TTL, CMOS, LVCMOS3.3, LVCMOS2.5, User Defined

Interchannel deviation	Between digital channels: ± 1 sampling interval Between digital and analog channels (when digital channel is triggered): $\pm (1 \text{ sample interval} + 1 \text{ ns})$ Between digital and analog channels (when analog channel is triggered): $\pm 4\text{ns}$
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USB Arbitrary Waveform Generator (Option)	
Number of channels	1
Maximum 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 to +1.5 V (50 Ω load) -3 V to +3 V (high resistance load)
Output Waveform Type	Sine, Square, Pulse, Triangle, Noise, DC and 45 built-in Arbitrary Waves
Output Impedance	50 $\Omega \pm 2\%$
safeguard	Over-voltage protection, current limit protection
simple harmonic vibration	
frequency	1 μ Hz to 25 MHz
Vertical accuracy (10 kHz)	$\pm (1\% \text{ setting} + 3 \text{ mVpp})$
amplitude flatness	± 0.3 dB relative to 10 kHz, 5 Vpp
SFDR (Spurious-free dynamic range)	DC ~ 1 MHz: -60 dBc 1 MHz ~ 5 MHz: -55 dBc 5 MHz ~ 25 MHz: -50 dBc
HD (Harmonic Distortion)	DC ~ 5 MHz: -50 dBc 5 MHz ~ 25 MHz: -45 dBc
Square wave/pulse wave	
frequency	1 μ Hz to 10 MHz
duty cycle	1% to 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 to 300 kHz
linearity	< 0.1% of output peak (typical, 1 kHz, 1 Vpp, 50% symmetry)
symmetry	0% to 100%
direct current (D.C.)	

voltage offset	$\pm 1.5 \text{ V}$ (50 Ω load) $\pm 3 \text{ V}$ (high resistance load)
offset accuracy	$\pm (\text{set offset value} * 1\% + 3 \text{ mV})$
noises	
Bandwidth (-3dB)	> 25 MHz

arbitrary waveform	
frequency	1 μ Hz to 5 MHz
Arbitrary wave length	16 kpts
sampling rate	125 MSa/s
import method	Upper computer import, U disk import, channel waveforms directly imported

connector	
front panel	USB 2.0 Host. SBUS: Siglent Logic Analyzer Interface Probe calibration signal: 1 kHz, 3 V square wave
rear panel	USB 2.0 Host; USB 2.0 Device; LAN: 10M/100M Ethernet interface (RJ45 terminal); Auxiliary outputs: including TRIG OUT (3.3 V LVCMOS) PASS/FAIL OUT (3.3 V TTL)

demonstrate	
monitor	7-inch color capacitive touchscreen
resolution (of a photo)	1024×600
Contrast ratio (typical)	500:1
Backlight intensity (typical)	500 nit

Display Settings	
Display range	8 x 10 compartments
Waveform display mode	Point, vector
Afterglow Settings	Off, 1 sec, 5 sec, 10 sec, 30 sec, infinite
Screen Display Method	Normal, color temperature
Display Language	Simplified Chinese, Traditional Chinese, English, French, Japanese, German, Spanish, Russian, Italian, Portuguese
Built-in help system	Simplified Chinese, English

matrix	
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environmental temperature	Work: 0°C~ +50°C Non-operating: -30°C~ +70°C
Humidity range	Operating: 5% ~ 90% RH, 30°C, upper limit derated to 50% RH at 50°C. Non-operating: 5% ~ 95% RH
altitude	Operating: ≤3,000 m, 25°C Non-working: ≤15,000m
electromagnetic compatibility	Conforms to the EMC Directive (2014/30/EU) and conforms to or is better than IEC 61326-1:2012/EN61326-1:2013 (base).

	(this request)		
	conductive 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)
	Rapid electrical transients Impulse Flock (EFT)	iec 61000-4-4/en 61000-4-4	2 kV (AC input port)
	(electrical) surge	iec 61000-4-5/en 61000-4-5	1 kV (Fire to Zero) 2 kV (fire/zero to ground)
	RF continuous conduction immunity	iec 61000-4-6/en 61000-4-6	3 V, 0.15-80 MHz
	Voltage dips and short-term interruptions	iec 61000-4-11/en 61000-4-11	Voltage transient: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Short interruptions: 0% UT during 250/300 cycles
safety norm	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		

electric power source

Input Specification	100 to 240 Vrms, 50/60 Hz
power (output)	80W Max, 40W Typ, Standby 4W Typ

machine structure

sizes	W × H × Th = 312 mm × 151 mm × 132.6 mm (including knob and support foot)
weights	Net weight 2.6 kg, gross weight 3.8 kg





Ordering Information

Product Model	Product Description
SDS824X HD	4 channels, 200 MHz bandwidth, 2 GSa/s sample rate
SDS814X HD	4 channels, 100 MHz bandwidth, 2 GSa/s sample rate
SDS804X HD	4 channels, 70 MHz bandwidth, 2 GSa/s sample rate
SDS822X HD	2 channels, 200 MHz bandwidth, 2 GSa/s sample rate
SDS812X HD	2 channels, 100 MHz bandwidth, 2 GSa/s sample rate
SDS802X HD	2 channels, 70 MHz bandwidth, 2 GSa/s sample rate

Standard Accessories	quantities
USB cable	1 root
Quick Guide	1 book
passive probe	1 set/channel
Calibration certificates	1 copy
power cable (of an appliance etc)	1 root

Optional accessories	Specification
Arbitrary waveform generator option (software)	SDS800XHD-FG
USB Isolated Arbitrary Waveform Generator Hardware	SAG1021I
16 digital channel option (software)	SDS800XHD-16LA
16-way logic analyzer hardware	SLA1016
Power analysis option (software)	SDS800XHD-PA
Phase Calibration Board	DF2001A

Optional accessories

Optional accessories	photograph	model number	Product Specification Description
demo board		STB-3	Output signals include square wave, sine wave, AM signal, fast edge, pulse, PWM, I2C, CAN, LIN and other typical signals.
USB Isolated Arbitrary Waveform Generator		SAG1021I	25 MHz USB isolated arbitrary waveform generator module with integrated sine, square, triangle, pulse, noise, DC, and 45 built-in arbitrary waveforms, which can also be edited by the user via the EasyWave host software.
16-way logic analyzer hardware		SLA1016	Logic analyzer kit, connected via a dedicated SBUS interface to the SDS800X HD, providing 16 digital channels.
Phase Calibration Board		DF2001A	Power analysis companion accessory to calibrate the phase of current and voltage probes.

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 founders of Dingyang Technology began to focus on oscilloscope research and development, and successfully developed the first digital oscilloscope in 2005. After years of development, Dingyang products have been expanded to digital oscilloscopes, handheld oscilloscopes, function/arbitrary waveform generators, spectrum analyzers, vector network analyzers, RF/microwave signal sources, desktop multimeters, DC power supplies, electronic loads and other basic test and measurement instruments, is one of the few manufacturers in the world that can simultaneously develop, produce and sell four major products of general electronic test and measurement instruments, namely, digital oscilloscopes, signal generators, spectrum analyzers and vector network analyzers, and is a national key "small giant" manufacturer. It is one of the very few manufacturers in the world that can simultaneously develop, produce and sell digital oscilloscopes, signal generators, spectrum analyzers and vector network analyzers, and is a national key "small giant" enterprise. At the same time, it is also one of the few domestic competitors that owns these four main products and has entered the high-end field with all the four main products. Headquartered in Shenzhen, with subsidiaries in Cleveland, USA and Augsburg, Germany, and a branch office in Chengdu, SIGLENT has become a globally recognized brand of test and measurement instruments with its products exported to more than 80 countries and regions around the world.

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