# SDS1000X-E Series Super Phosphor Oscilloscope



DataSheet-2019.05



#### Key Features

- ↓ 100 MHz, 200 MHz bandwidth models
- Two channel series have one 1 GSa/s ADC, four channel series have two 1 GSa/s ADCs. When all channels are enabled, each channel has a maximum sample rate of 500 MSa/s. When a single channel per ADC is active, it has sample rate of 1 GSa/s
- The newest generation of SPO technology
  - Waveform capture rate up to 100,000 wfm/s (normal mode), and 400,000 wfm/s (sequence mode)
  - Supports 256-level intensity grading and color display modes
  - Record length up to 14 Mpts
  - Digital trigger system
- Intelligent trigger: Edge, Slope, Pulse Width, Window, Runt, Interval, Time out (Dropout), Pattern
- Serial bus triggering and decoding (Standard), supports protocols IIC, SPI, UART, CAN, LIN
- 🖊 Video trigger, supports HDTV
- 🚣 Low background noise with voltage scales from 500 μV/div to 10 V/div
- I0 types of one-button shortcuts, supports Auto Setup, Default, Cursors, Measure, Roll, History, Display/Persist, Clear Sweep, Zoom and Print
- Segmented acquisition (Sequence) mode, divides 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 segment to capture the qualifying event.
- History waveform record (History) function, maximum recorded waveform length is 80,000 frames.
- Automatic measurement function for 38 parameters as well as Measurement Statistics, Zoom, Gating, Math, History and Reference functions
- 1 Mpts FFT, four-channel series support Peaks, Markers, a variety of numbers
- Math and measurement functions use all sampled data points (up to 14 Mpts)
- Math functions (FFT, addition, subtraction, multiplication, division, integration, differential, square root)
- Preset key can be customized for user settings or factory "defaults"
- Security Erase mode
- High Speed hardware based Pass/Fail function
- MSO, 16 digital channels (four channel series only, option)
- Bode plot, Measuring Power Supply Control Loop Response (four-channel series only)
- V Search and navigate (four channel series only)
- USB AWG module (four channel series only, option)
- USB WIFI adapter (four channel series only, option)
- Web Browser based control (four channel series only)
- Large 7 inch TFT -LCD display with 800 \* 480 resolution
- Multiple interface types: USB Host, USB Device (USB-TMC), LAN, Pass / Fail, Trigger Out
- J- Supports SCPI remote control commands
- VXI-11+SCPI, Telnet(Port 5024)+SCPI and Socket(Port 5025)+SCPI programming over LAN
- J- Supports web control and virtual panel for both PC and mobile terminals
- Web update rate of up-to 10times/s provides nearly real-time updating with SDS1000X-E(four channel series only)
- 4- Supports Multi-language display and embedded online help

SDS1104X-E SDS1204X-E SDS1202X-E

#### **Product overview**

SIGLENT's new SDS1000X-E Super Phosphor Oscilloscopes feature two channel and four channel models. The two channel model is available with a 200 MHz analog bandwidth, a single ADC with 1 GSa/s maximum sample rate, and a single memory module with 14 Mpts of sample memory. The four channel scope is available in 100 and 200 MHz models and incorporates two 1 GSa/s ADCs and two 14 Mpts memory modules. When all channels are enabled, each channel has sample rate of 500 MSa/s and a standard record length of 7 Mpts. When only a single channel per ADC is active, the maximum sample rate is 1 GSa/s and the maximum record length is 14 Mpts. For ease-of-use, the most commonly used functions can be accessed with its user-friendly front panel design.

The SDS1000X-E series employs a new generation of SPO (Super-Phosphor Oscilloscope) technology that provides excellent signal fidelity and performance. The system noise is also lower than similar products in the industry. It comes with a minimum vertical input range of 500 uV/div, an innovative digital trigger system with high sensitivity and low jitter, and a waveform capture rate of 400,000 frames/sec (sequence mode). The SDS1000X-E also employs a 256-level intensity grading display function and a color temperature display mode not found in other models in this class. SIGLENT's latest oscilloscope offering supports multiple powerful triggering modes including serial bus triggering. Serial bus decoding for IIC, SPI, UART, CAN, LIN bus types are included. The X-E models also include History waveform recording, and sequential triggering that enable extended waveform recording and analysis. Another powerful addition is the new 1 million points FFT math function that gives the SDS1000X-E very high frequency resolution when observing signal spectra. The new digital design also includes a hardware co-processor that delivers measurements quickly and accurately without slowing acquisition and front-panel response. The features and performance of SIGLENT's new SDS1000X-E cannot be matched anywhere else in this price class.

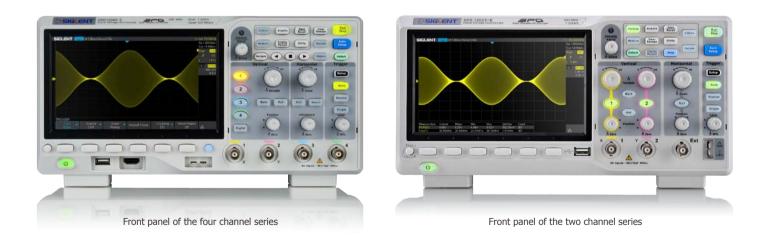
The four channel series support even more functions, including: searching and navigating, on-screen Bode plot, 16 digital channels (Option), an external USB powered 25 MHz AWG module (Option), a USB WIFI adapter (Option), and an embedded application that allows remote control via web browser.

### Models and key Specification

Model	SDS1104X-E	SDS1204X -E SDS1202X-E
Bandwidth	100 MHz	200 MHz
Sampling Rate (Max.)	Two channel series have a single 1 GSa/s ADC, fou channels are enabled, each channel has a maximum spair is active, that channel has sample rate of 1 GSa/	sample rate of 500 MSa/s. When a single channel per
Channels	4 (four channel series) 2+EXT (two channel series)	
Memory Depth (Max.)	7 Mpts/CH (not interleave mode); 14 Mpts/CH (interleave mode)	
Waveform Capture Rate (Max.)	100,000 wfm/s (normal mode), 400,000 wfm/s (seque	ence mode)
Trigger Type	Edge, Slope, Pulse Width, Window, Runt, Interval, Dro	opout, Pattern, Video
Serial Trigger and decoder (Standard)	IIC, SPI, UART, CAN, LIN	
16 Digital Channels (four channel series only, option)	Maximum waveform capture rate up to 1 GSa/s, Reco	rd length up to 14 Mpts/CH
USB AWG module (four channel series only, option)	One channel, 25 MHz, sample rate of 125 MHz, wave	length of 16 kpts
Bode plot ( four channel series only)	Minimum start frequency of 10 Hz, minimum scan ba MHz (dependent on Oscilloscope and AWG bandwidth	,
USB WIFI adapter (four channel series only, option)	802.11b/g/n, WPA-PSK, the adapter must be supplied	by Siglent to ensure working
I/O	USB Host, USB Device, LAN, Pass/Fail, Trigger Out, Sb	us (Siglent MSO)
Probe (Std)	4 pcs passive probe PP510	4/2 pcs passive probe PP215
Display	7 inch TFT -LCD (800x480)	
Weight	Four channel series: Without package 2.6 kg; With pa Two channel series: Without package 2.5 kg; With package 2.5	

### **Function & Characteristics**

### 7 inch TFT-LCD display and 10 one-button menus

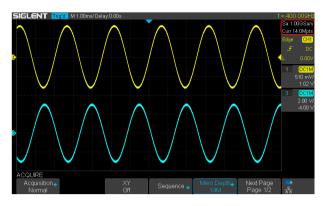


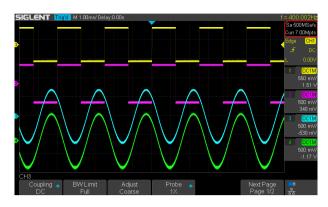
• 7 -inch TFT -LCD display with 800 \* 480 resolution

• Most commonly used functions are accessible using 10 different one-button operation keys: Auto Setup, Default, Cursor, Measure, Roll, History, Persist, Clear Sweep, Zoom, Print

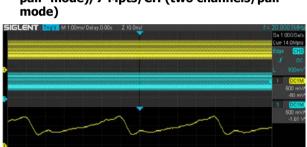
### **Function & Characteristics**

When all channels are enabled, each channel has a maximum sample rate of 500 MSa/s. When a single channel per pair is active, that channel has sample rate of 1 GSa/s





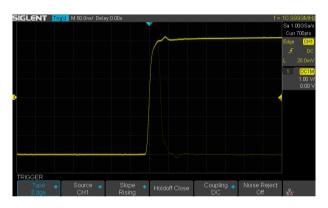
The four channel series has two 1 GSa/s ADC chips (channel 1 and 2 share one, channel 3 and 4 share another), so that each channel can achieve sample rates up to 500 MSa/s and work on bandwidths of 200 MHz when all channels are enabled.



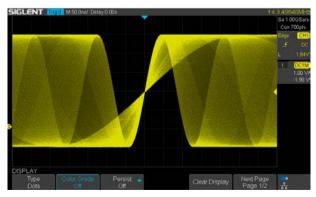
#### Record Length of up to 14 Mpts (single channel/ pair mode), 7 Mpts/CH (two channels/pair mode)

Using hardware-based Zoom technologies and max record length of up to 14 Mpts, users are able to oversample to capture for longer time periods at higher resolution and use the zoom feature to see more details within each signal.

#### Waveform Capture Rate up to 400,000 wfm/s

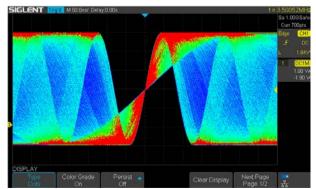


With a waveform capture rate of up to 400,000 wfm/s (sequence mode), the oscilloscope can easily capture the unusual or low-probability events.



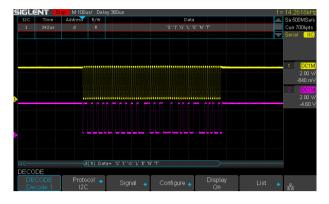
#### 256 -Level Intensity Grading and Color Temperature Display

SPO display technology provides fast refresh rates. The resulting intensity-graded trace is brighter for events that occur with more frequency and dims when the events occur with less frequency.



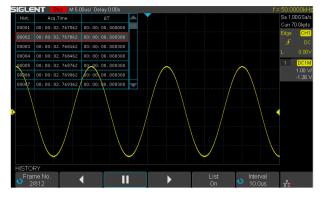
The color temperature display is similar to the intensity-graded trace function, but the trace occurrence is represented by different colors (color "temperature") as opposed to changes in the intensity of one color. Red colors represents the more frequent events, while blue is used to mark points that occur lest frequently.

Serial Bus Decoding Function (Standard)



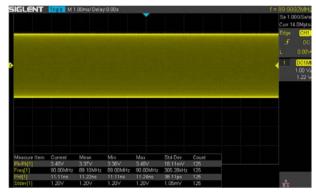
SDS1000X-E displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in a tabular format.

History Waveforms (History) Mode and Segmented Acquisition (Sequence)



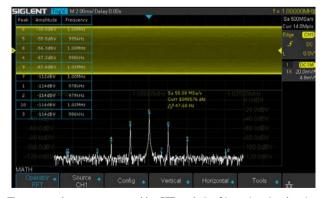
Playback the latest triggered events using the history function. Segmented memory collection will store trigger events into multiple (Up to 80,000) memory segments, each segment will store triggered waveforms and timestamp of each frame.

#### **I** True measurement to 14 M points



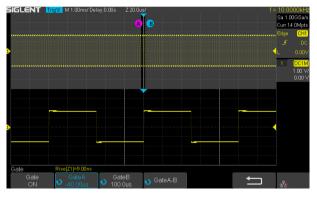
SDS1004X-E can measure all sampled data points up to 14 Mpts. This ensures the accuracy of measurements while the math co-processor decreases measurement time and increases ease-of-use.

#### I M point used to calculate the FFT



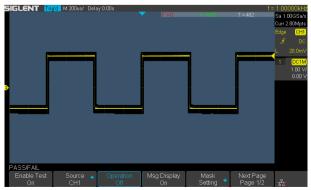
The new math co-processor enables FFT analysis of incoming signals using up to 1 M samples per waveform. This provides high frequency resolution with a fast refresh rate. The FFT function also supports a variety of window functions so that it can adapt to different spectrum measurement needs. Four-channel series support Peaks, Markers, a variety of numbers.

#### Gate and Zoom Measurement



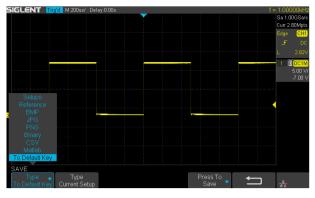
Through Gate and Zoom measurement, the user can specify an arbitrary interval of waveform data analysis and statistics. This helps avoid measurement errors that can be caused by invalid or extraneous data, greatly enhancing the measurements' validity and flexibility.

#### Hardware-Based High Speed Pass/ Fail function



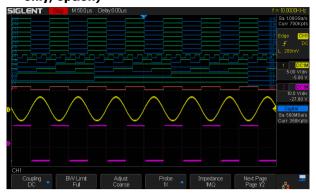
The SDS1000X-E utilizes a hardware-based Pass/Fail function, performing up to 40,000 Pass / Fail decisions each second. Easily generate user defined test templates provide trace mask comparison making it suitable for long-term signal monitoring or automated production line testing.

#### 4 Customizable Default Key



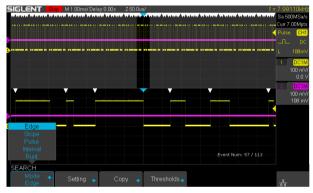
The current parameters of the oscilloscope can be preset to Default Key through the Save menu.

16 Digital Channels/MSO (four channel series only, option)



16 digital channels enables users to acquire and trigger on the waveforms then analyze the pattern, simultaneously with one instrument.

#### Search and Navigate (four channel series only)



The SDS1000X-E can search events specified by the user in a frame. It can also navigate by time (delay position) and historical frames.



#### Bode Plot (four channel series only)



SDS1000X-E can control the USB AWG module or control an independent SIGLENT SDG instrument, scan a devices amplitude and phase frequency response, and display the data as a Bode Plot. There is also a Vari-level Mode for accurately measuring Power Supply Control Loop Response (PSRR). It can also show the result lists, and export the data to a USB disk.



USB WIFI Adapter (four channel series only, option)



WiFi control of instrumentation can provide a convenient and safe method of configuring and collecting data. This new feature works with a SIGLENT approved WiFi adapter to provide wireless control and communications with SIGLENT 4 channel scopes. The adapter must be supplied by Siglent to ensure working.

USB 25 MHz AWG Module (four channel series only, option)



The four channel series supports a USB 25 MHz function/arbitrary waveform generator that is operated from the USB host connection. Functions include Sine, Square, Ramp, Pulse, Noise, DC and 45 built-in waveforms. The arbitrary waveforms can be accessed and edited by the SIGLENT EasyWave PC software.



With the new embedded web server, users can control the SDS1xx4X-E from a simple web page. This provides wonderful remote troubleshooting and monitoring capabilities. The web page has PC and mobile styles that include an embedded virtual control panel

Real-time update screen in web page (four channel series only)



With 100 Mbps LAN connection, the web page can update the waveforms at a rate of up to 10 times/s. The new information on SDS1000X-E can be updated to web page in real-time, including waveform data and measurements. When viewed on a PC, the screen can be displayed in full screen mode. With this feature and a PC VGA interface, you can easily use a projector or other video display device to deliver the screen information to a larger audience.

Web control (four channel series only)

### Complete Connectivity



Back panel of the four channel series



Back panel of the two channel series

SDS1000X -E supports USB Host, USB Device (USB -TMC), LAN(VXI -11), Pass/Fail and Trigger Out

## Specifications

Acquire System	
Sampling Rate	1 GSa/s (single channel/pair), 500 MSa/s (two channels/pair)
Memory Depth	Max 14 Mpts/Ch (single channel/pair), 7 Mpts/Ch (two channels/pair)
Peak Detect	2 ns (Four channel series)
	4 ns (Two channel series)
Average	Averages:4, 16, 32, 64, 128, 256, 512, 1024
Eres	Enhance bits:0.5, 1.5, 2, 2.5, 3
Waveform interpolation	Sin(x)/x, Linear

Input	
Channels	4 (Four channel series) 2+EXT (Two channel series)
Coupling	DC, AC, GND
Impedance	DC: $(1 M\Omega \pm 2\%) \parallel (15 pF \pm 2 pF)$ (Four channel series) DC: $(1 M\Omega \pm 2\%) \parallel (18 pF \pm 2 pF)$ (Two channel series)
Max.Input voltage	1 MΩ: ≤400 Vpk(DC + Peak AC <=10 kHz)
CH to CH Isolation	DC-Max BW: >40 dB
Probe attenuation	0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X1000X, 2000X, 5000X, 10000X

Vertical System	
Bandwidth ( -3 dB )	200 MHz (SDS1204X-E/SDS1202X-E) 100 MHz (SDS1104X-E)
Vertical Resolution	8-bit
Vertical Scale (Probe 1X)	500 µV/div - 10 V/div (1-2-5 sequence )
	500uV~118mV: ±2V
Offset Range (Probe 1X)	120mV~1.18V: ±20V
	1.2V~10V: ±200V
Bandwidth Limit	20 MHz ±40%
	DC- 10% (BW): ± 1 dB
Bandwidth Flatness	10%- 50% (BW): ± 2 dB
	50%- 100% (BW): + 2 dB/-3 dB
Low Frequency Response (AC -3 dB)	≤2 Hz (at input BNC)
	ST-DEV $\leq 0.5$ division (<1 mV/div)
Noise	ST-DEV $\leq 0.2$ division ( $< 2$ mV/div)
	ST-DEV $\leq 0.1$ division ( $\geq 2$ mV/div)
SFDR including harmonics	≥35 dB
DC Gain Accuracy	≤±3.0%: 5 mV/div-10 V/div
De Gain Accuracy	≤±4.0%: ≤2 mV/div
Offset Accuracy	±(1%* Offset+1.5%*8*div+2 mV): ≥2 mV/div
Onset Accuracy	±(1%* Offset+1.5%*8*div+500 uV): ≤1 mv/div
Risetime	Typical 1.8 ns (SDS1204X-E/SDS1202X-E)
KISEUIIIE	Typical 3.5 ns (SDS1104X-E)
Overshoot (500 ps Pulse)	<10%

Horizontal System	
Timebase Scale	1.0 ns/div-100 s/div
Channel Skew	<100 ps
Waveform Capture Rate	Up to 100,000 wfm/s (normal mode), 400,000 wfm/s (sequence mode)
Intensity grading	256 Levels
Display Format	Y-T, X-Y,Roll
Timebase Accuracy	±25 ppm
Roll Mode	50 ms/div-100 s/div (1-2-5 sequence)

Trigger System	
Trigger Mode	Auto, Normal, Single
Trigger Level	Internal: ±4.5 div from the center of the screen
	EXT: ±0.6 V (Two channel series)
	EXT/5: ±3 V (Two channel series)
Holdoff Range	80 ns- 1.5 s
Trigger Coupling	AC DC LFRJ HFRJ Noise RJ
	DC: Passes all components of the signal
Coupling Frequency Response	AC: Blocks DC components and attenuates signals below 8 Hz
coupling requency response	LFRJ: Blocks the DC component and attenuates the low-frequency components below 2 MHz
	HFRJ: Attenuates the high-frequency components above 1.2 MHz
	DC: Passes all components of the signal
Coupling Frequency Response (EXT, Two channels series)	AC: Blocks DC components and attenuates signals below 20 Hz
	LFRJ: Blocks the DC components and attenuates low-frequency components below 7 khz
	HFRJ: Attenuates high-frequency components above 160 khz
Trigger Accuracy (typical)	Internal: ±0.2 div
Trigger Accuracy (typical)	EXT (Two channel series): ±0.4 div
	DC - Max BW 0.6 div
	EXT (Two channel series): 200 mVpp DC- 10 MHz
Trigger Sensitivity	300 mVpp 10 MHz - BW frequency
	EXT/5 (Two channel series): 1 Vpp DC – 10 MHz
	1.5 Vpp 10 MHz -BW frequency
Trigger Jitter	< 100 ps
Trigger Displacement	Pre-Trigger: 0 - 100% Memory
	Delay Trigger: 0 to 10,000 div
Edge Trigger	
Slope	Rising, Falling, Rising&Falling
Source	All channels/ EXT/ (EXT/5)/ AC Line (Two channel series) All channels/ AC Line (Four channel series)
Slope Trigger	
Slope	Rising, Falling
LimitRange	<,>,<>,><
Source	All channels
TimeRange	2 ns- 4.2 s
Resolution	1 ns

SDS1000X-E Series Digital Oscilloscope

Pulse Trigger	
Polarity	+wid , -wid
Limit Range	<,>,<>,><
Source	All channels
Pulse Range	2 ns ~ 4.2 s
Resolution	1 ns
Video Trigger	
Signal Standard	NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, Custom
Source	All channels
Sync	Any, Select
Trigger condition	Line, Field
Window Trigger	
Window Type	Absolute, Relative
Source	All channels
Interval Trigger	
Slope	Rising, Falling
Limit Range	< , > , <> , ><
Source	All channels
Time Range	2 ns ~ 4.2 s
Resolution	1 ns
Dropout Trigger	
Timeout Type	Edge, State
Source	All channels
Slope	Rising, Falling
Time Range	2 ns ~ 4.2 s
Resolution	1 ns
Runt Trigger	
Polarity	+wid , -wid
Limit Range	< , > , <> , ><
Source	All channels
Time Range	2 ns ~ 4.2 s
Resolution	1 ns
Pattern Trigger	
Pattern Setting	Invalid, Low, High
Logic	AND, OR, NAND, NOR
Source	All channels
Limit Range	< , > , <> , ><
Time Range	2 ns ~ 4.2 s
Resolution	1 ns

Serial Trigger	
I2C Trigger	
Condition	Start, Stop, Restart, No Ack, EEPROM, 7 bits Address & Data, 10 bits Address & Data, Data Length
Source (SDA/SCL)	All channels
Data format	Hex
Limit Range	EEPROM: =, >, <
Data Length	EEPROM: 1 byte Addr & Data: 1 ~ 2 byte Data Length: 1 ~ 12 byte
R/W bit	Addr & Data: Read, Write, Do not care
SPI Trigger	
Condition	Data
Source (CS/CL/Data)	All channels
Data format	Binary
Data Length	4 ~ 96 bit
Bit Value	0, 1, X
Bit Order	LSB, MSB
UART Trigger	
Condition	Start, Stop, Data, Parity Error
Source (RX/TX)	All channels
Data format	Hex
Limit Range	=, >, <
Data Length	1 byte
Data Width	5 bit, 6 bit, 7 bit, 8 bit
Parity Check	None, Odd, Even
Stop Bit	1 bit, 1.5 bit, 2 bit
Idle Level	High, Low
Baud Rate (Selectable)	600/1200/2400/4800/960019200/38400/57600/115200 bit/s
Baud Rate (Custom)	300 bit/s ~ 5000000 bit/s
CAN Trigger	
Condition	Start Remote, ID, ID + Data, Error
Source	All channels
ID	STD (11 bit), EXT (29 bit)
Data Format	Hex
Data Length	1~2 byte
Baud Rate	5 k/10 k/20 k/50 k/100 k/125 k/250 k/500 k/800 k/1 M bit/s
LIN Trigger	
Condition	Break, Frame ID, ID+Data, Error
Source	All channels
ID	1 byte
Data Format	Hex
Data Length	1 ~ 2 byte
Baud Rate (Selectable)	600/1200/2400/4800/9600/19200 bit/s
Baud Rate (Custom)	300 bit/s ~ 20 kbit/s

ZDecode           Signal         SCL, SDA           Address         Jolis, 10 bits           Threshold         4.5 ~ 4.5 dw           Threshold         1~7 lines           Start         Start           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Signal         Signal, Saling, Falling           Threshold         Signal Scope Signal (3 chance)           Signal         Signal Scope Signal (3 chance)           Signal<	Serial Decoder	
SignalSC, SDAAdress7bis, 10 bisAdress4.5 - 4.5 divItsehold1 - 7 linesSIPACederSC, SDA, SDA, SC, SC, Achanel scopes can only use 2 signal identifiers)StpaleSCM, SDA, SDA, SC, SC, Achanel scopes can only use 2 signal identifiers)Bit OrderStal, SBABit OrderSta	Number of Decoders	2
AdressPist No bisThreshold4.5 × 4.5 viaThreshold1.7 lineSIP ConcertSIP ConcertSignalCMSD, OGSD, CS (2 channel scopes can only use 2 signal identifiers)Edge SelectMise, SallingBit OrderMise, SallingBit OrderMise, SallingThreshold4.5 viaBit Order1.7 liaStartMise, SallingBit OrderSit SelectSingalNa ConcertSingalNa ConcertSingalNa ConcertSingalSit SelectNational ScienceSit SelectSingalSit SelectSingalNa ConcertSingalSit SelectSingalSit SelectSit	I2C Decoder	
Threshold4.5 ~ 4.5 dviThreshold> 7 linsSelectalSignalScl_MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)Edge SelectNising, FallingBit OrderMSB, LSBThreshold> 4.5 ~ 4.5 dviLitet> 7 linsNising, Falling> Nising, Falling	Signal	SCL, SDA
Lista valuesSPLecoderSignalSCMISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)Edge SeletNais, FallingBitOrderSS ISBThresholdA 5 4.5 divLista valuesDataA 5 4.5 divSignalSitA ScopeData WithSitA ScopeSignalSitA ScopeSitA Sc	Address	7 bits, 10 bits
SPI Decoder           Signal         GL/MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)           Edge Selet         Rising, Falling           BtOrder         MSB, LSB           Threshold         4.5 ~ 4.5 div           Threshold         1~7 lines           Data Width         1~7 lines           Data Width         Ski f, 5 bit, 7 bit, 8 bit           Data Width         Nen, Odd, Even           Stop Bit         I bit, 1.5 bit, 2 bit           Ide Level         Kow, High           Threshold         A.5 ~ 4.5 div           Ide Level         Kow, High           Threshold         1.6 Lift, 2 bit           Ide Level         Kow, High           Threshold         1.6 Zint, 2 Cow, High           Stop Bit         1.6 Xint, CANL, CANL, Med, Scope           Stop Bit         Scope	Threshold	-4.5 ~ 4.5 div
SignalSch,MSX,OxGS,C (channel scopes can only use 2 signal identifiers)Ede SelectMisi, FallingBit OrderMisi, ScalingThresholA.5 « A.5 » A.5 » A.5 « A.5 » A.5 » A.5 « A.5 » A.5	List	1 ~ 7 lines
Edge SelectRising, FallingBit OrderMSB, LSBThreshold-4.5 ~ 4.5 divList- ~ 7 linesUNT OF COLSPACESignalRx TXData WidthS bit, 6 bit, 7 bit, 8 bitParity CheckNone, Odd, EvenStop BitIbit, 15 bit, 2 bitJet LevelNone, Odd, EvenIde LevelKu, HighThreshold-5 ~ 4.5 divStop Bit-5 ~ 4.5 divStop Bit-6 N-CStop Bit-7 InesStop Bit-7 InesStop Bit-7 InesStop Bit-7 Stop BitStop Bit <td>SPI Decoder</td> <td></td>	SPI Decoder	
Bit OrderM8g. LSBThreshold4.5 ~ 4.5 divList1 ~ 1 liss3 ~ 1 liss3 K 3 K 3 K 3 K 3 K 3 K 3 K 3 K 3 K 3 K	Signal	SCL,MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers)
Threshold4.5 ~ 4.5 divList~ 7 linesKKSignalKX TAData WidthSit, 6 bit, 7 bit, 8 bitParity CheckNone, Odd, EvenStop Bit1 bit, 1.5 bit, 2 bitIde LevelKow, HighThreshold4.5 ~ 4.5 divSignal1.6 ° A.5 divSignalColst, Colst,	Edge Select	Rising, Falling
List         i ~ 7 lines           UART Decoder            Signal         Rx Tx           Data Width         Sib (a	Bit Order	MSB, LSB
ART Decoder      Singal RX TACCODE A      Singal RX TACCODE A      Singal RX TACCODE A      Singal Si	Threshold	-4.5 ~ 4.5 div
SignalRx TXData WidthSit, 6 bit, 7 bit, 8 bitParity CheckNone, Odd, EvenStop Bit1 bit, 1 S bit, 2 bitIde LevelLow, HighThreshold4.5 ~ 4.5 divThreshold- 7 linesSignalCM_HCAL_CAL_CAL_CAL_CAL_CAL_CAL_CAL_CAL_CAL_	List	1 ~ 7 lines
Data Width5 bit, 6 bit, 7 bit, 8 bitParity CheckNone, Odd, EvenStop Bit1 bit, 1.5 bit, 2 bitIde LevelLow, HighThreshold-4.5 ~ 4.5 divThreshold- 7 IneaCAT DecoderSignalCM, H, CAN_LStoree- 4.5 ~ 4.5 divStoree- 4.5 ~ 4.5 divIt reshold- 5. ~ 4.5 divStoree- 6.5 ~ 4.5 divStoree- 7.1 IneaIt reshold- 7.1 IneaIt storee- 7.1 IneaLit Storee- 7.1 Inea <td>UART Decoder</td> <td></td>	UART Decoder	
Parity CheckNone, Odd, EvenStop Bit1bt, 1.5 bit, 2 bitIde LevelLow, HighThreshold4.5 ~ 4.5 divList- ~ 1 lines- ~ 1 linesCM-MCAN_LStandaCAN_HCAN_LCAN_LACAN_LStore- ~ 1 linesList- ~ 1 linesList- ~ 1 linesStore- ~ 1 linesList- ~ 1 linesStore- ~ 1 linesList- ~ 1 linesL	Signal	RX, TX
Stop Bit1 bit, 1.5 bit, 2 bitIde LevelLow, HighThreshold4.5 ~ 4.5 divList1 ~ 7 linesCAN DecoderSignalCAN_H, CAN_L, CAN_H-CAN_LStoreeCAN_H, CAN_L, CAN_H-CAN_LThreshold4.5 ~ 4.5 divList1 ~ 7 linesList1 ~ 7 linesList1 ~ 7 linesList1 ~ 7 linesList1 ~ 7 linesLin Specification Package RevisionVer1.3, Ver2.0Lin Specification Package Revision4.5 ~ 4.5 divLin Specification Package RevisionVer1.3, Ver2.0Lin Specification Package Revision4.5 ~ 4.5 divLin Specification Package RevisionVer1.3, Ver2.0Lin Specification Package RevisionVer1.3, Ver2.0 <td< td=""><td>Data Width</td><td>5 bit, 6 bit, 7 bit, 8 bit</td></td<>	Data Width	5 bit, 6 bit, 7 bit, 8 bit
Idle LevelLow, HighThreshold-4.5 « A.5 divList1 ~ 7 linesCAN DecoderSignalCM_H, CAN_LSourceCM_H, CAN_L-CAN_LThreshold-4.5 « A.5 divList1 ~ 7 linesList1 ~ 7 linesList1 ~ 7 linesList- 5 . SignalList- 6 . SignalList- 6 . SignalList- 6 . SignalList- 7 linesList- 7 linesList- 5 . SignalList- 5 . Signal	Parity Check	None, Odd, Even
Threshold       -4.5 a Via         Threshold       1 ~ 7 Iies         List       1 ~ 7 Iies         Signal       CAN_H, CAN_L         Source       CAN_H, CAN_L, CAN_H-CAN_L         Threshold       -4.5 ~ 4.5 div         List       1 ~ 7 Iies         List       -4.5 ~ 4.5 div         List       -4.5 ~ 4.5 div         List       1 ~ 7 Iies         List       1 ~ 7 Iies         List       -4.5 ~ 4.5 div         List       1 ~ 7 Iies         List       -4.5 ~ 4.5 div         List       -5.7 ~ 4.5 div         List       -5.7 ~ 4.5 div         List       -5.7 ~ 4.5 div	Stop Bit	1 bit, 1.5 bit, 2 bit
List1 ~ 7 linesCAN DecoderSignalCM_H, CAN_LSourceCM_H, CAN_L+CAN_LACAThreshold-4.5 ~ 4.5 divList1 ~ 7 linesLIN DecoderLIN Specification Package RevisionFurs. Specification Package RevisionAr State Schler-5.5 divLineshold-5.5 div <td>Idle Level</td> <td>Low, High</td>	Idle Level	Low, High
CAN Decoder         Signal       CAN_H, CAN_L         Source       CAN_H, CAN_L, CAN_H-CAN_L         Threshold       -4.5 ~ 4.5 div         List       1 ~ 7 lines         LIN Specification Package Revision       Ver1.3, Ver2.0         Threshold       -4.5 ~ 4.5 div	Threshold	-4.5 ~ 4.5 div
SignalCAN_H, CAN_LSourceCAN_H, CAN_H-CAN_LThreshold-4.5 ~ 4.5 divList1 ~ 7 linesLIN DecoderLIN Specification Package RevisionVer1.3, Ver2.0Threshold-4.5 ~ 4.5 div	List	1 ~ 7 lines
SourceCAN_H, CAN_H-CAN_LThreshold-4.5 ~ 4.5 divList1 ~ 7 linesLIN DecoderLIN Specification Package RevisionVer1.3, Ver2.0Threshold-4.5 ~ 4.5 div	CAN Decoder	
Threshold     -4.5 ~ 4.5 div       List     1 ~ 7 lines       LIN Decoder     -4.5 ~ 4.5 div       Lin Specification Package Revision     Ver1.3, Ver2.0       Threshold     -4.5 ~ 4.5 div	Signal	CAN_H, CAN_L
List     1 ~ 7 lines       LIN Decoder     Ver1.3, Ver2.0       Threshold     -4.5 ~ 4.5 div	Source	CAN_H, CAN_L, CAN_H-CAN_L
LIN Specification Package Revision     Ver1.3, Ver2.0       Threshold     -4.5 ~ 4.5 div	Threshold	-4.5 ~ 4.5 div
LIN Specification Package RevisionVer1.3, Ver2.0Threshold-4.5 ~ 4.5 div	List	1 ~ 7 lines
Threshold -4.5 ~ 4.5 div	LIN Decoder	
	LIN Specification Package Revision	Ver1.3, Ver2.0
List 1 ~ 7 lines	Threshold	-4.5 ~ 4.5 div
	List	1 ~ 7 lines

Measurement			
Source	All channels, A	All channels in Zoom, Math, All References, History	
Number of Measurements		surements at the same time . 5 measurements displayed in statistics table.	
Measurement Range	Screen region,		
Measurement Paramete			
	Max	Highest value in input waveform	
	Min	Lowest value in input waveform	
	Pk-Pk	Difference between maximum and minimum data values	
	Ampl	Difference between top and base in a bimodal signal, or between max and min in an unimodal signal	
	Тор	Value of most probable higher state in a bimodal waveform	
	Base	Value of most probable lower state in a bimodal waveform	
	Mean	Average of all data values	
	Cmean	Average of data values in the first cycle	
Vertical (Voltage)	Stdev	Standard deviation of all data values	
	Cstd	Standard deviation of all data values in the first cycle	
	VRMS	Root mean square of all data values	
	Crms	Root mean square of all data values in the first cycle	
	FOV	Overshoot after a falling edge; (base-min)/Amplitude	
	FPRE	Overshoot before a falling edge; (max-top)/Amplitude	
	ROV	Overshoot after a rising edge; (max-top)/Amplitude	
	RPRE	Overshoot before a rising edge; (base-min)/Amplitude	
	Level@X	the voltage value of the trigger point	
	Period	Time between the middle threshold points of two consecutive, like-polarity edges	
	Freq	Reciprocal of period	
	+Wid	Time difference between the 50% threshold of a rising edge to the 50% threshold of the next falling edge of the pulse	
	-Wid	Time difference between the 50% threshold of a falling edge to the 50% threshold of the next rising edge of the pulse	
	Rise Time	Duration of rising edge from 10-90%	
Horizontal ( Time )	Fall Time	Duration of falling edge from 90-10%	
	Bwid	Time from the first rising edge to the last falling edge, or the first falling edge to the last rising edge at the 50% crossing	
	+Dut	Ratio of positive width to period	
	-Dut	Ratio of negative width to period	
	Delay	Time from the trigger to the first transition at the 50% crossing	
	Time@Level	Time from the trigger to each rising edge at the 50% crossing. When Statistics is Off, it shows the time from the trigger to the last rising edge at the 50% crossing. When Statistics is On, it shows the Current, Mean, Min, Max, Standard Deviation of time from the trigger to each rising edge at the 50% crossing in multiple frames (number = Count).	
	Phase	Phase difference between two edges	
Delay	FRR	Time from the first rising edge of channel A to the following first rising edge of channel B	
	FRF	Time from the first rising edge of channel A to the following first falling edge of channel B	
	FFR	Time from the first falling edge of channel A to the following first rising edge of channel B	
	FFF	Time from the first falling edge of channel A to the following first falling edge of channel B	
	LRR	Time from the first rising edge of channel A to the last rising edge of channel B	
	LRF	Time from the first rising edge of channel A to the last falling edge of channel B	
	LFR	Time from the first falling edge of channel A to the last rising edge of channel B	
	LFF	Time from the first falling edge of channel A to the last falling edge of channel B	
	Skew	Time of source A edge minus time of nearest source B edge	

Measurement	
Cursors	Manual : Time X1, X2, (X1-X2), (1/ΔT) Voltage Y1, Y2, (Y1-Y2) Track: Time X1, X2, (X1-X2)
Statistics	Current, Mean, Min, Max, Stdev, Count
Counter	Hardware 6 bit 6-digit counter ( channels are selectable )

Math Function	
Operation	+ , - , * , / , FFT , d/dt , ∫dt , √
FFT window	Rectangular, Blackman, Hanning, Hamming, Flattop
FFT display	Full Screen, Split, Exclusive

USB AWG Module (four channel series only, option)			
Channel	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 ~ +1.5 V (50Ω load)		
	-3 ~ +3 V (High-Z load)		
Waveform Type	Sine, Square, Ramp, Pulse, Noise, DC and 45 built-in waveforms		
Output impedance	50 Ω±2%		
Protection	Over-Voltage Protection, Current-Limiting Protection		
Sine			
Frequency	1 μHz ~ 25 MHz		
Offset Accuracy (10 kHz)	±(1%*Offset Setting Value +3 mVpp)		
Amplitude flatness (10 kHz, 5 Vpp)	±0.3 dB		
	DC ~ 1 MHz -60 dBc		
SFDR	1 MHz ~ 5 MHz -55 dBc		
	5 MHz ~ 25 MHz -50 dBc		
HD	DC ~ 5 MHz -50 dBc		
	5 MHz ~ 25 MHz -45 dBc		
Square/Pulse			
Frequency	1 μHz ~ 10 MHz		
Duty Cycle	1% ~ 99%		
Rise/Fall time	< 24 ns (10% ~ 90%)		
Overshoot (1 kHz,1 Vpp, Typical)	< 3% (typical 1 kHz, 1 Vpp)		
Pulse Width	> 50 ns		
Jitter	< 500 ps + 10 ppm		
Ramp			
Frequency	1 μHz ~ 300 kHz		
Linearity (Typical)	< 0.1% of Pk-Pk (Typical, 1 kHz, 1 Vpp, 50% Symmetry)		
Symmetry	0% ~ 100%		

Noise         >255 MHz (-3 dB)           Arbitrary Wave         I µHz ~ 5 MHz           Frequency         1 µHz ~ 5 MHz           Nave Length         16 kpts           Samphing Rate         125 MSa/s           acad in         EasyWave and U-Disk           Digital Channels (four channels conly, option)           No. of Channels         16           Ads. Sampling Rate         16 Sa/s           Hencory Depth         14 Mpts/CH           Ver of Channels         16 Sa/s           Hencory Depth         4 Mpts/CH           Ver of Channels         16 Sa/s           Hencory Depth         4 Mpts/CH           Ver of Channels         16 Sa/s           Hencory Depth         4 Mpts/CH           Ver of Channels         16 Sa/s           evel Group         00 -D:D, Sa-D15           evel Group         00 -D:D:S + 1 sampling interval           Digital to Analog: # (1 sampling interval b)         10 Sa Sa           Judget Type         ThL (MOS, LVCMOS3.3, LVCMOS2.5, custom           Samofard         USB Mot (1 for two channel series, and 2 for four channel series), USB Device, AN, Pass/Fail, Trigger Out           Sass/Fail         3.3 V TL Output           Display Mosci         400 valca	DC		
iiii         iiii           bickcaracy         iiii           koccaracy         iiii           koccaracy         >25 Mit (: 3 dB)           korder         >25 Mit (: 3 dB)           korder         >25 Mit (: 3 dB)           korder         1 kp dE           korder Korder         1 kp d		±1.5 V (50 Ω load)	
Noise         Sector of Control           Bandwidth         >25 MHz (-3 dB)           Arbitrary Wave         I µHz - 5 MHz           Frequency         1 µHz - 5 MHz           Wave Length         16 kpts           Samphing Rate         125 MSA/s           ead in         EasyWave and U-Disk           Digital Channels (four channels series only, option)           No. of Channels         16           Max. Sampling Rate         16 Sa/s           Hemory Depth         14 Mpts/CH           Hemory Depth         4 Mpts/CH           Value evel Group         00-D-D, Be-D15           evel Range         48 V - 8 V           Segreg Type         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Jogici Type         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Segreg Type         3.3 V TL Output           Display Correon         Segreg Type           Display Correon         200-D20 x 480           Display Note         300 nit           Segreg Type         24 bit           Correats (Typical)         300 nit           Display (Maveform)         24 bits           Display Mode         001 s 5. sec., 30 Sec., 10 Sec., 30 Sec., 10 Mite           Display Mode         0f. 1 S	Offset range	±3 V (High-Z load)	
standwidth         >25 MH2 (-3 dB)           Arbitrary Wave         I µH2 ~ 5 MH2           irequency         I µH2 ~ 5 MH2           kave length         16 kpts           isanping Rate         16 kpts           cad in         EasyMave and U-Diak           Digital Channels (four channels series only, option)           Digital Channels (four channels series only, option)           Optical Series only, option)           Optical Channels (four channels series only, option)           Optical Channels (four channels series only, option)           No. of Channels           A fly kg/CH           Adv Series only, option)           Optical Channels Series, and Series, a	Accuracy	±( offset *1%+3 mV)	
Arbitrary Wave         I µHz - 5 MHz           Frequency         1 µHz - 5 MHz           Nave Length         16 kpts           sampling Rate         125 MSa/s           ead in         EsyWave and U-Disk           Digital Channels (four channels series only, option)            No. of Channels         16 Sav/Save and U-Disk           Varia Ka: Sampling Rate         16 Sav/Save and U-Disk           Varia V         4 Na           Varia V         8 V	Noise		
requency1 µtz - 5 MtzWave Length16 kptsWave Length16 kptsBangling Rate125 MSa/sLead inEarly wave and U-DiskDigital Channels (four character series only, option)16No. of Channels16Ass. Sampling Rate165/sAss. Sampling Rate165/sMarken Sampling Rate105/sMarken Sampling Rate100-07. DBx-D15Level Group00-07. DBx-D15Level Group00-07. DBx-D15Level Group00-07. DBx-D15Level Range00-07. SDx-D15Level Range00-07. SDx-D15Level Range00-07. SDx-D15Level Group00-07. SDx-D15Level Range00-07. SDx-D15	Bandwidth	>25 MHz (-3 dB)	
Wave Length         16 kpts           Sampling Rate         125 MSa/s           Laad in         EasyWave and U-Disk           Digital Channels (four channel series only, option)            No. of Channels         16           Memory Depth         16 Sa/s           Veneory Depth         4 Mpts/CH           Min. Detectable Pulse Width         4 ns           Area Sampling Rate         8 V ~ 8 V           Level Group         00~07, D8~D15           Level Range         8 V ~ 8 V           Logic Type         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Level Range         05B Host (1 for two channel series), and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Saps/Fail         3.3 V TL Output           Display Type         7-Inch TFT LCD           Display Npp         800~480           Saps/Fail         900 vit           Saps/Pailo         900-11           Sapslay Npp         500-1           Sapslay Npp         500-1           Sapslay Noto         800 vit           Sapslay Noto         900 vit           Sapslay Mode         0ct, Vector           Display Mode         0ct, Vector           Sapslay Mode         0ct, Vector </td <td>Arbitrary Wave</td> <td></td>	Arbitrary Wave		
sampling Rate12 Ms/sLead inEasyWave and U-DiskDigital Channels (four charmeries only, option)No. of Channels16Max. Sampling Rate16 Sa/sMemory Depth14 Mpts/CHMin. Detectable Pulse Width4 nsevel Group00-D7, D8-D15evel Group00-D7, D8-D15evel Group78 V ~ 8 Vserver Group00-D7, D8-D15evel Group00-D1evel Group00	Frequency	1 μHz ~ 5 MHz	
Addition         EasyNave and U-Disk           Digital Channels (four channels colly, option)         I           No. of Channels         16           Max. Sampling Rate         16Ss/s           Memory Depth         14 Mpts/CH           Memory Depth         14 Mpts/CH           Level Group         0x-07, D8-D15           Level Group         0x-07, D8-D15           Level Range         8V ~ 8 V           Logic Type         TL, CMOS CLOMOS3.3, LVCMOS2.5, custom           Logic Type         TL, CMOS LVCMOS3.3, LVCMOS2.5, custom           Logic Type         TL, CMOS LVCMOS3.3, LVCMOS2.5, custom           Samdard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Jass/Fail         3.3 V TL Output           Display Type         Jeich TFT LCD           Display Robotion         800×480           Display Robotion         800×480           Display Robotion         600 nit           Ladedight         00 nit           Logic Typical)         4.1 divisions           Display Mode         0x (Vetor           Lange         0x (Vetor           Display Mode         0x (Vetor           Lange         0x (Vetor	Wave Length	16 kpts	
Digital Channels (four channels         series only, option)           vo. of Channels         16           vo. of Channels         1GSa/s           Menory Depth         14 Mpts/CH           vere Group         Do~D7, D8~D15           exvel Group         Do~D7, D8~D15           exvel Group         D0~D15: ±1 sampling interval           exvel Range         8V ~ 8 V           exvel Range         D0~D15: ±1 sampling interval ±1 ns)           bigital to Analog: ± (1 sampling interval ±1 ns)         Do~D15: ±1 sampling interval ±1 ns)           t/O         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           ass/Fail         30 TL Output           Display (Screen)         Vincomponential series), and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           SasyFail         30 TL Output           Display (Screen)         Vincomponential series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           SasyFail         300 TL Output           Display Coreen         Vincomponential series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Display Mode         000 TL           Ostat (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Display Mode	Sampling Rate	125 MSa/s	
No. of Channels6Max. Sampling Rate16Sa/sMemory Depth14 Mpts/CHMin. Detectable Pulse Width4 nsacvel Group00~07, D8~015acvel Group00~07, D8~015acvel Group-8 V ~ 8 Vacvel Group00~015: ±1 sampling interval D0~015: ±1 sampling interval ±1 ns)StewD0~015: ±1 sampling interval D0~015: ±1 sampling interval ±1 ns)StewD0~015: ±1 sampling interval ±1 ns)StedardUSB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out 3.3 V TL OutputDisplay Kereen>VDisplay Kereen>90~480Display Cofor40 thContrast (Typical)300 nitBandard00 nitContrast (Typical)300 nitBandard00 nitDisplay Mode0/x 480Display Mode0/x 40.Display Mode0/x 40.Contrast (Typical)0/x 40.Display Mode0/x 40.Display Mode0/x 40.Contrast (Typical)0/x 40.Display Mode0/x 40.Contrast (Typical)0/x 40.Display Mode0/x 40.Contrast (Typical)0/x 40.Display Mode0/x 40.Contrast (Typical)0/x 40.Display Mode0/	Lead in	EasyWave and U-Disk	
Ass. sampling RateIsGa/sMemory Depth14 Mpts/CHMin. Detectable Pulse Width4 nsLevel Group0x-D7, D8-D15Level Group15 V × 8VLevel RangeTL, CMOS, LIXCMOS2.5, customLogic TypeTL, CMOS, LIXCMOS2.5, customLogic TypeSignal to Analog: ± (1 sampling interval ± 1 ns)StandardUS Host (1 for two channel series), and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger OutDisplar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)Displar KoreenSignal to Analog: ± (1 sampling interval ± 1 ns)	Digital Channels (four ch	nannel series only, option)	
Memory Depth14 Mpts/CHMin. Detectable Pulse Width4 nsLevel GroupDo-D7, D8-D15Level Group48 V ~ 8 VLogic TypeTL, CMOS, LVCMOS3.3, LVCMOS2.5, customLogic TypeTL, CMOS, LVCMOS3.3, LVCMOS2.5, customSekwDo-D15: ±1 sampling interval bigital to Analog: ± (1 sampling interval +1 ns)K/OStandardLypeUSB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out 3.3 V TL. OutputDisplay (Screen)StandardDisplay Type7-Inch TFT LCDDisplay Resolution800×480Solox480800×480Contrast (Typical)500:1Contrast (Typical)500:1Standard8.14 divisionsDisplay Mode0x, VectorPass/Fine0x, 10 sec, 5 Sec, 10 Sec, 30 Sec, 1nfiniteDisplay Mode0x, VectorStandard0xoral, ColorStart Display0xoral, ColorStart Display10 sin, 10 min, 30 min, 1 hour, Off	No. of Channels	16	
Number         A ns           Level Group         Do-07, D8-D15           Level Range         -8 V ~ 8 V           Level Range         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Level Range         Do-015: ±1 sampling interval Digital to Analog: ± (1 sampling interval ) Digital to Analog: ± (1 sampling interval - 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Standard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Display (Screen)         3.3 V TTL Output           Display (Screen)	Max. Sampling Rate	1 GSa/s	
evel GroupDo-D7, D8~D15evel Group-8 V ~ 8 VLogic TypeTL, CMOS, LVCMOS3.3, LVCMOS2.5, customskewDo-D15 : 11 sampling interval Digital to Analog: ± (1 sampling interval + 1 ns)t/OUtranspireJSB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out 3, 3 V TL OutputDisplay (Screen)JSB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out 3, 3 V TL OutputDisplay (Screen)	Memory Depth	14 Mpts/CH	
Ave Range-8 V ~ 8 VLogic TypeTL, CMOS, LVCMOS3.3, LVCMOS2.5, customSkewDo-D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns)JobDigital to Analog: ± (1 sampling interval +1 ns)JOJS<	Min. Detectable Pulse Width	4 ns	
Logic Type         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Logic Type         TL, CMOS, LVCMOS3.3, LVCMOS2.5, custom           Skew         Dio/D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns)           LO         Logic Type           Standard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Standard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Standard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Standard         USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out           Display (Screen)         3.3 V TL Output           Display Type         7-inch TFT LCD           Standard         800×480           Coloratst (Typical)         800×480           Contrast (Typical)         500:1           Standard         8 x 14 divisions           Display (Waveform)         500 nit           Display Mode         Dot, Vector           Off 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite           Color Display         Normal, Color           Standard         1 min, 5 min, 10 min, 30 min, 1 hour, Off	Level Group	D0~D7, D8~D15	
Skew         DovD15: ±1 sampling interval Digital to Analog: ± (1 sampling interval + 1 ns)           JOD	Level Range	-8 V ~ 8 V	
Digital to Analog: ± (1 sampling interval +1 ns)           Image:	Logic Type	TTL, CMOS, LVCMOS3.3, LVCMOS2.5, custom	
StandardUSB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger OutPass/Fail3.3 V TL OutputDisplay (Screen)7.inch TF LCDDisplay Resolution600×480Display Color24 bitContrast (Typical)500:1Backlight300 nitAnge8.14 divisionsDisplay ModeDi, Sc, S Sec, 10 Sec, 30 Sec, InfiniteDisplay Mode0.ft Sec, S Sec, 10 Sec, 30 Sec, InfiniteContrast Time0.ft Sec, S Sec, 10 Sec, 30 Sec, InfiniteParsist Time0.ft Sec, S Sec, 10 Sec, 30 Sec, InfiniteContrast Contrast Contrast Color DisplayNormal, ColorStandard1.int, 5 min, 10 min, 30 min, 1 hour, Off	Skew		
Pass/Fail         3.3 V TTL Output           Display (Screen)         -           Display Type         7-inch TFT LCD           Display Resolution         800×480           Display Color         24 bit           Contrast (Typical)         500:1           Backlight         300 nit           Range         8 x 14 divisions           Display Mode         Dot, Vector           Persist Time         Of, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite           Color Display         Normal, Color           Screen Saver         1 min, 5 min, 10 min, 30 min, 1 hour, Off	I/O		
Display (Screen)         7-inch TFT LCD           Display Type         7-inch TFT LCD           Display Resolution         800×480           Display Color         24 bit           Contrast (Typical)         500:1           Backlight         300 nit           Backlight         300 nit           Display Mode         Dot, Vector           Persist Time         Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite           Color Display         Normal, Color           Screen Saver         1 min, 5 min, 10 min, 30 min, 1 hour, Off	Standard	USB Host (1 for two channel series, and 2 for four channel series), USB Device, LAN, Pass/Fail, Trigger Out	
Display Type7-inch TFT LCDDisplay Resolution800×480Display Color24 bitContrast (Typical)500:1Backlight300 nitRange8 x 14 divisionsDisplay ModeDot, VectorPersist TimeDot, Vector, 30 Sec, 1nfiniteColor DisplayMormal, ColorStarten Saver1 min, 5 min, 10 min, 30 min, 1 hour, Off	Pass/Fail		
Display Resolution800×480Display Color24 bitContrast (Typical)500:1Backlight300 nitRange8 x 14 divisionsDisplay ModeDx VectorDisplay ModeDx VectorColor DisplayMona, ColorColor DisplayNormal, ColorSeren Saver1 min 5 min 10 min 30 min 1 hour, Off	Display (Screen)		
Display Color       24 bit         Contrast (Typical)       500:1         Sacklight       300 nit         Range       8 x 14 divisions         Display Mode       Dot, Vector         Persist Time       Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite         Color Display       Normal, Color         Screen Saver       1 min, 5 min, 10 min, 30 min, 1 hour, Off	Display Type	7-inch TFT LCD	
Contrast (Typical)500:1Backlight300 nitBacklight300 nitBange8 x 14 divisionsDisplay (Waveform)Dot, VectorDisplay ModeDot, VectorPersist TimeOff, 1 Sec, 5 Sec, 10 Sec, 30 Sec, InfiniteColor DisplayNormal, ColorScreen Saver1 min, 5 min, 10 min, 30 min, 1 hour, Off	Display Resolution	800×480	
Backlight300 nitRange8 x 14 divisionsDisplay (Waveform)Dot, VectorDisplay ModeDot, VectorPersist TimeOff, 1 Sec, 5 Sec, 10 Sec, 30 Sec, InfiniteColor DisplayNormal, ColorScreen Saver1 min, 5 min, 10 min, 30 min, 1 hour, Off	Display Color	24 bit	
Range     8 x 14 divisions       Display (Waveform)     Display Mode       Display Mode     Dot, Vector       Persist Time     Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite       Color Display     Normal, Color       Screen Saver     1 min, 5 min, 10 min, 30 min, 1 hour, Off	Contrast (Typical)	500:1	
Display (Waveform)         Display Mode       Dot, Vector         Persist Time       Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite         Color Display       Normal, Color         Screen Saver       1 min, 5 min, 10 min, 30 min, 1 hour, Off	Backlight	300 nit	
Display Mode     Dot, Vector       Persist Time     Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite       Color Display     Normal, Color       Screen Saver     1 min, 5 min, 10 min, 30 min, 1 hour, Off	Range	8 x 14 divisions	
Persist Time     Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite       Color Display     Normal, Color       Screen Saver     1 min, 5 min, 10 min, 30 min, 1 hour, Off	Display (Waveform)		
Color Display     Normal, Color       Screen Saver     1 min, 5 min, 10 min, 30 min, 1 hour, Off	Display Mode	Dot, Vector	
Screen Saver 1 min, 5 min, 10 min, 30 min, 1 hour, Off	Persist Time	Off, 1 Sec, 5 Sec, 10 Sec, 30 Sec, Infinite	
	Color Display	Normal, Color	
anguage Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Russian, Italian, Portuguese	Screen Saver	1 min, 5 min, 10 min, 30 min, 1 hour, Off	
	Language	Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Russian, Italian, Portuguese	

SDS1000X-E Series Digital Oscilloscope

Environments			
Temperature	Operating: $10^{\circ}C \sim +40^{\circ}C$		
	Non-operating: $-20^{\circ}C \sim +60^{\circ}C$		
Humidity	Operating: 85% RH, 40°C , 24 hours		
	Non-operating: 85% RH, $65^{\circ}$ C , 24 hours		
Height	Operating: ≤3000 m		
	Non-operating: ≤15,266 m		
Compliance	LVD IEC 61010-1:2010		
Compliance	EMC EN61326-1:2013		

Power Supply		
Input Voltage	100 - 240 Vrms (± 10%), 50 / 60 Hz 100 - 120 Vrms (± 10%), 400 Hz	
Power	50W Max(Four channel series) 25W Max(Two channel series)	

Mechanical (Four channel series)		
Dimensions	Length: 312 mm	
	Width: 132.6 mm	
	Height: 151 mm	
Weight	N.W: 2.6 kg; G.W: 3.8 kg	

Mechanical (Two channel series)		
	Length: 312 mm	
Dimensions	Width: 134 mm	
	Height: 150 mm	
Weight	N.W: 2.5 kg; G.W: 3.5 kg	

### **Probes and Accessories**

Probe	Model	Picture	Description
Passive	PP510		Bandwidth: 100 MHz, 1X/10X, 1M/10 Mohm,300 V/600 V Bandwidth: 200 MHz, 1X/10X, 1M/10 Mohm, 300 V/600 V
	PP215	66666	
Current Probe	CP4020		Bandwidth: 100 KHz, Max. continuous current: 20 Arms, Peak current: 60 A Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: 50 mV/A (0.4 A-10 Apk) $\pm$ 2%, 5 mV/A (1 A-60 Apk) $\pm$ 2%, 9 V battery source
	CP4050		Bandwidth: 1 MHz, Max. continuous current: 50 Arms, Peak current: 140 A Switch Ratio: 500 mV/A, 50 mV/A Accuracy: 500 mV/A (20 mA-14 ApK ) $\pm$ 3% $\pm$ 20 mA , 50 mV/A (200 mA- 100 ApK) $\pm$ 4% $\pm$ 200 mA, 50 mV/A (100 A-140 ApK) $\pm$ 15% max, 9V battery source
	CP4070		Bandwidth: 150 KHz, Max. continuous current: 70 Arms, Peak current: 200 A Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: 50 mV/A (0.4 A-10 ApK) $\pm$ 2%, 5 mV/A (1 A-200 ApK) $\pm$ 2%, 9V battery source
	CP4070A		Bandwidth: 300 KHz, Max. continuous current: 70 Arms, Peak current: 200 A Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A (50 m A-10 ApK) $\pm$ 3% $\pm$ 50 mA, 10 mV/A (500 mA-40 ApK) $\pm$ 4% $\pm$ 50 mA, 10 mV/A (40 A-200 ApK) $\pm$ 15% max, 9 V battery source
	CP5030		Bandwidth: 50 MHz, Max. continuous current: 30 Arms, Peak current: 50 A Switch Ratio: 100 mV/A, 1 V/A, Accuracy: 1 V/A ( $\pm$ 1% $\pm$ 1 mA), 100 mV/A ( $\pm$ 1% $\pm$ 10 mA), DC 12 V/ 1.2 A power adapter
	CP5030A		Bandwidth: 100 MHz, Max. continuous current: 30 Arms, Peak current: 50 A Switch Ratio: 100 mV/A, 1 V/A, Accuracy: 1 V/A ( $\pm$ 1% $\pm$ 1 mA), 100 mV/A ( $\pm$ 1% $\pm$ 10 mA), DC 12V/1.2A power adapter
	CP5150		Bandwidth: 12 MHz, Max. continuous current: 150 Arms, Peak current: 300 A Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A ( $\pm$ 1% $\pm$ 10 mA), 10 mV/A ( $\pm$ 1% $\pm$ 100 mA), DC 12 V/1.2 A power adapter
	CP5500		Bandwidth: 5 MHz, Max. continuous current: 500 Arms, Peak current: 750 A Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A ( $\pm$ 1% $\pm$ 10 mA), 10 mV/A ( $\pm$ 1% $\pm$ 100 mA), DC 12 V/1.2 A power adapter
Differential Probe	DPB4080		Bandwidth: 50 MHz, Differential Range: 800 V (DC + Peak AC), 100 X/200 X/500 X/1000 X, Accuracy: ±1%, DC 9 V/1 A power adapter

Probe	Model	Picture	Description
Differential Probe	DPB5150		Bandwidth: 70 MHz, Differential Range: 1500 V (DC + Peak AC),50 X/500 X Accuracy: ±2%, DC 5 V/1 A USB adapter
	DPB5150A		Bandwidth: 100 MHz, Differential Range: 1500 V (DC + Peak AC), 50X/500X , Accuracy: ±2% DC 5 V/1 A USB adapter
	DPB5700		Bandwidth: 70 MHz, Differential Range: 7000 V (DC + Peak AC), 100X/1000X , Accuracy: ±2%, DC 5 V/1 A USB adapter
	DPB5700A		Bandwidth: 100 MHz Differential Range: 7000 V (DC + Peak AC), 100X/1000X Accuracy: ±2% DC 5 V/1 A USB adapter
High Voltage	HPB4010		Bandwidth: 40 MHz Differential Range: DC 10 KV, AC (rms): 7 KV (sine), AC (Vpp): 20 KV (Pulse) 1000X Accuracy: ≤3%
Isolated front end	ISFE		The USB Device interface allows a connection into the GPIB interface. USB-GPIB adapter allows the oscilloscope to easily send and receive commands through the GPIB. USB follows the USB2.0 specification. GPIB follows the IEEE488.2 standard.
Demo Board	STB-3		Output signals include square waves, sine, AM, fast edge , pulse, PWM, I2C, CAN, LIN etc. Used in teaching and demonstrations.
USB AWG Module	SAG1021	SACIO21 Internation	Output Sine, Square, Ramp, pulse, Noise, DC and 45 built-in waveforms. The arbitrary waveforms can be accessed and edited by the EasyWave PC software
Rack Mount	SDS1X-E-RMK		The height is 4U, shared by Two Channels and For Channels

Ordering information					
	SDS1000X-E Series Digital Oscilloscope				
Product Name	SDS1104X-E 100 MHz Four Channels				
Product Name	SDS1204X-E 200 MHz Four Channels				
	SDS1202X-E 200 MHz Two Channels				
	USB Cable -1				
	Quick Start -1				
Standard Accessories	Passive Probe -4/2				
	Certification -1				
	Power Cord -1				
	16 Channels MSO Software (four channel series only)	SDS1000X-E-16LA			
	16 Channels Logic Analyzer (four channel series only)	SLA1016			
	AWG Software (four channel series only)	SDS1000X-E-FG			
	USB AWG Module Hardware (four channel series only)	SAG1021			
	WIFI Software (four channel series only)	SDS1000X-E-WIFI			
	USB WIFI Adapter (four channel series only)	TL_WN725N			
Optional Accessories	Isolated Front End	ISFE			
	STB Demo Source	STB-3			
	High Voltage Probe	HPB4010			
	Current Probes	CP4020/CP4050/CP4070/CP4070A/CP5030/CP5030A/ CP5150/CP5500			
	Differential Probes	DPB4080/DPB5150/DPB5150A/DPB5700/DPB5700A			
	Rack Mount	SDS1X-E-RMK			

## SDS1000X-E Series Super Phosphor Oscilloscope



#### About SIGLENT

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

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

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