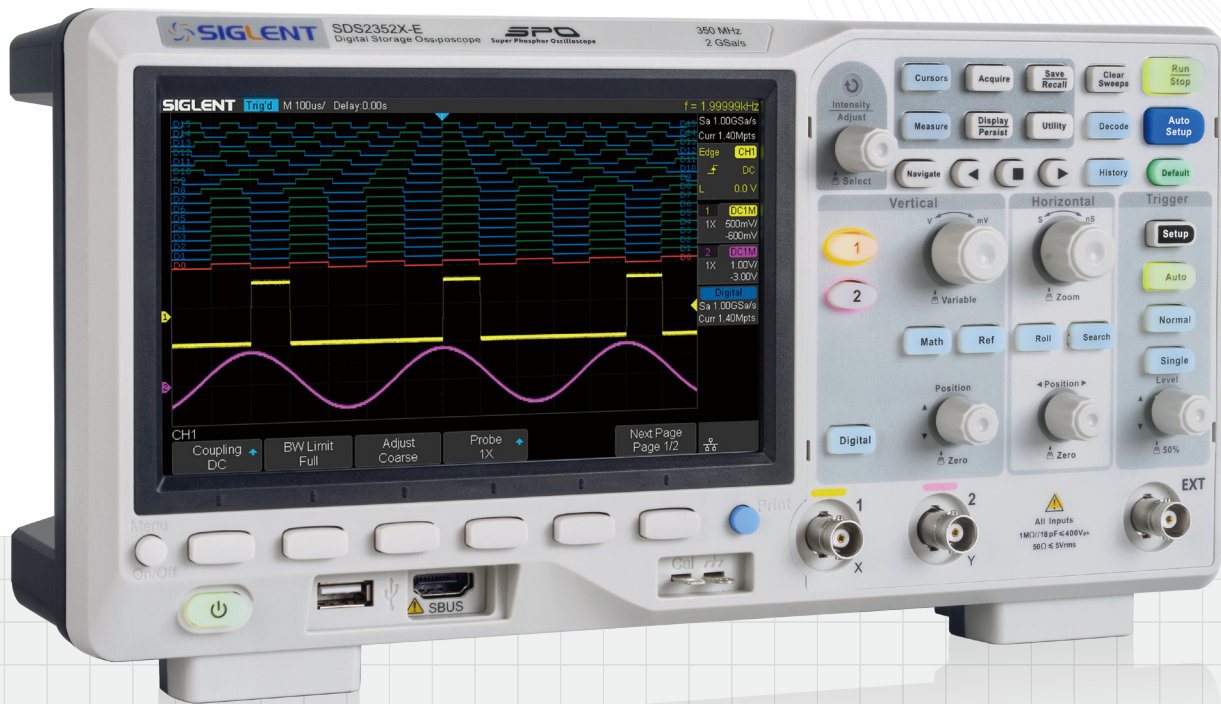


SDS2000X-E Series

Super Phosphor Oscilloscope



DataSheet-2020.11

SDS2202X-E




SDS2352X-E




























Product overview

SIGLENT's new SDS2000X-E Series Super Phosphor Oscilloscopes are available in two bandwidths; 200 MHz and 350 MHz. They each have a maximum sampling rate of 2 GSa/s and a standard record length of 28 Mpts. The most commonly used functions can be accessed with its user-friendly one-button design.

The SDS2000X-E series employs a new generation of SPO technology. With its excellent signal fidelity, background noise is lower than similar products in the industry. It has 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). It 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 newest oscilloscope offering supports multiple powerful triggering modes including serial bus triggering and decoding. History waveform recording and sequential triggering allow for extended waveform records to be captured, stored, and analyzed. Also included is the deep memory FFT. This math function uses up to 1 M samples for the FFT calculation, providing the SDS2000X-E with very high frequency resolution. The hardware co-processor executes true fast measurement and math to all of 28M sample points so that there is minimal distortion on analysis. It also supports searching and navigating, on-screen Bode plot, 16 channel digital /MSO (optional), an external USB powered 25 MHz AWG function generator module (option), a USB WIFI adapter for wireless control and monitoring (option), and an embedded application that allows remote control via web browser. The features and high-performance of the SDS2000X-E oscilloscopes cannot be matched else anywhere at this price.

Key Features

-  200MHz, 350MHz bandwidth models
-  Real-time sampling rate up to 2 GSa/s (1 GSa/s per channel, if both channels active)
-  The newest generation of SPO technology
 - Waveform capture rate up to 110,000 wfm/s (normal mode), and 400,000 wfm/s (sequence mode)
 - Supports 256-level intensity grading and color display modes
 - Record length up to 28 Mpts
 - Digital trigger system

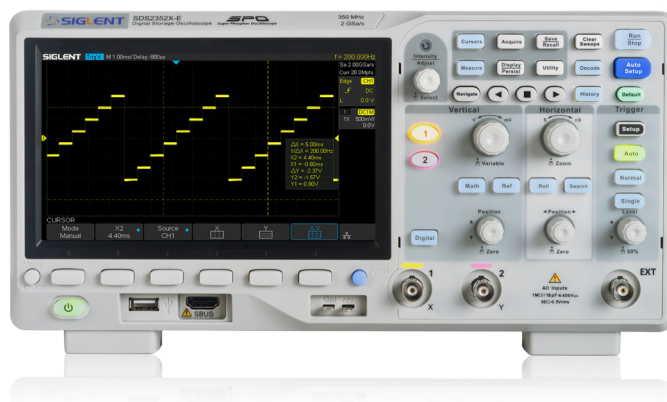
-  Intelligent trigger: Edge, Slope, Pulse Width, Window, Runt, Interval, Time out (Dropout), Pattern
-  Serial bus triggering and decoding (standard), supports protocols IIC, SPI, UART, CAN, LIN
-  Video trigger, supports HDTV
-  Low background noise with voltage scales from 500μV/div to 10V/div
-  10 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 qualifying events
-  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 Mpt FFT
-  Math and measurement functions use all sampled data points in memory (up to 28 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
-  16 Digital channels (MSO) (option)
-  Bode plot
-  Search and navigate
-  USB AWG module(option)
-  USB WIFI adapter(option)
-  Web Browser based control
-  Large 7 inch TFT -LCD display with 800 * 480 resolution
-  Multiple interface types: USB Host, USB Device (USB -TMC), LAN, Pass / Fail, Trigger Out
-  Supports SCPI remote control commands
-  VXI-11+SCPI, Telnet (port 5024) +SCPI and Socket (port 5025) +SCPI programming over LAN
-  Supports web control and virtual instrument control panel for both PC and mobile terminals
-  Web control update rate of up-to 10 times/s provides nearly real-time update rate
-  Supports Multi-language display and embedded online help

Models and key Specification

| Model | SDS2202X-E | SDS2352X-E |
|---------------------------------------|--|----------------------------|
| Bandwidth | 200 MHz | 350 MHz |
| Sampling Rate (Max.) | 2 GSa/s | |
| Channels | 2+EXT | |
| Memory Depth (Max.) | 14 Mpts/CH (not interleave mode) 28 Mpts/CH (interleave mode) | |
| Waveform Capture Rate (Max.) | 110,000 wfm/s (normal mode), 400,000 wfm/s (sequence mode) | |
| Trigger Type | Edge, Slope, Pulse Width, Window, Runt, Interval, Dropout, Pattern, Video | |
| Serial Trigger and decoder (Standard) | IIC, SPI, UART, CAN, LIN | |
| 16 Digital Channels (option) | Maximum waveform capture rate up to 1GSa/s, Record length up to 14 Mpts/CH | |
| USB AWG module (option) | One channel, 25 MHz, sample rate of 125 MHz, 16 kpts waveform memory sample size, isolated output (SAG1021I only) | |
| Bode plot | Minimum start frequency of 10 Hz, minimum scan bandwidth of 500 Hz, maximum scan bandwidth of 120 MHz (dependent on Oscilloscope and AWG bandwidth), 500 maximum scan frequency points | |
| USB WIFI adapter (option) | 802.11b/g/n, WPA-PSK NOTE: To ensure compatibility, we recommend using only SIGLENT WiFi accessories | |
| I/O | USB Host, USB Device, LAN, Pass/Fail, Trigger Out, Sbus (Siglent MSO) | |
| Probe (Std) | 2 pcs passive probe PP215 | 2 pcs passive probe SP2035 |
| Display | 7 inch TFT-LCD (800 x 480 pixels) | |
| Weight | Without package 2.6 Kg; With package 3.8 Kg | |

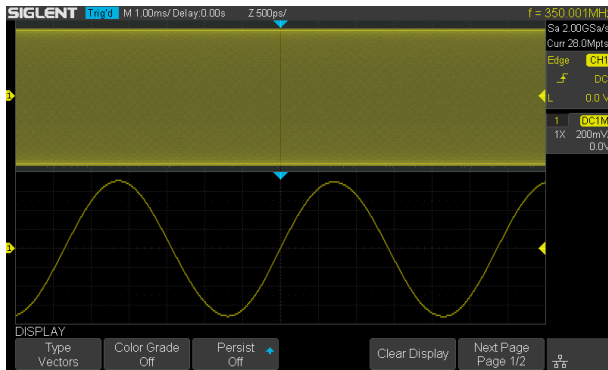
Function & Characteristics

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



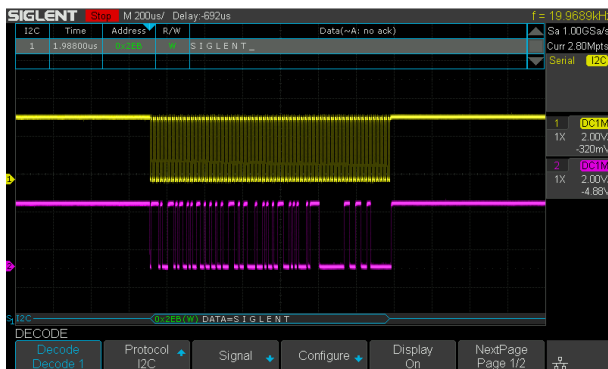
- 7-inch TFT-LCD display with 800 * 480 resolution
- Most commonly used functions are accessible using 10 different one-button operation keys: Auto Setup, Default, Cursor, Measure, Roll, History, Persist, Clear Sweep, Zoom, Print.

Maximum sample rate of 2 GSa/s, record Length of up to 28 Mpts



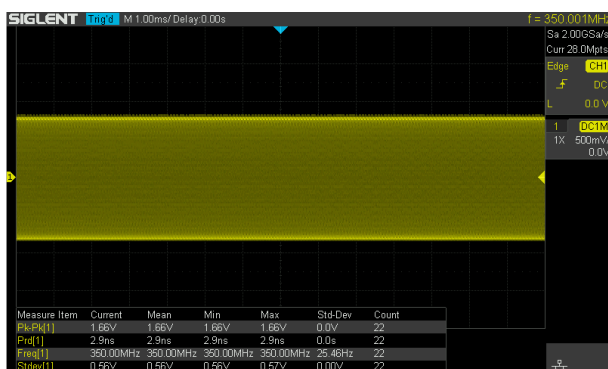
Using hardware-based Zoom technologies and max record length of up to 28 Mpts, users are able to oversample to capture for longer time periods at higher resolution and use the zoom feature to see more details within each signal.

Serial Bus Decoding Function (Standard)



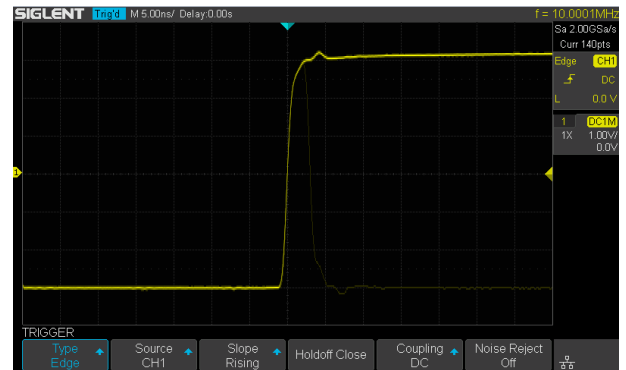
SDS2000X-E displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in a tabular format.

True measurement to 28 M points



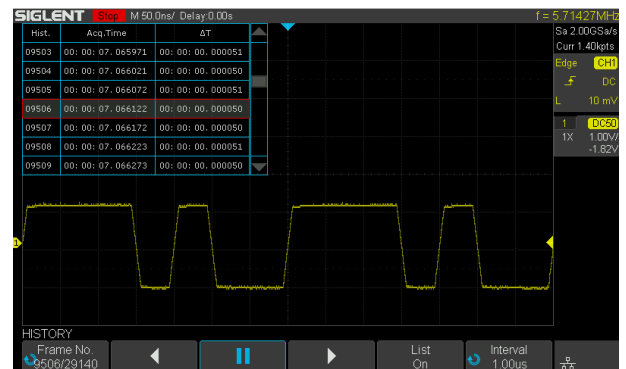
SDS2000X-E can apply automatic measurements on all sampled data points up to 28 Mpts. This ensures the accuracy of measurements while the math co-processor decreases measurement time and increases ease-of-use.

Waveform Capture Rate up to 400,000 wfms/s



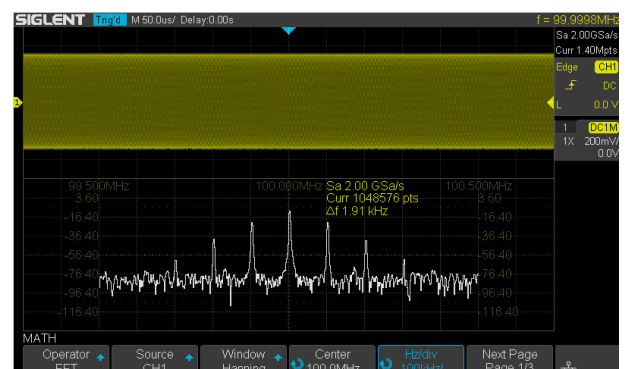
With a waveform capture rate of up to 400,000 wfms/s (sequence mode), the oscilloscope can easily capture the unusual or low-probability events.

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



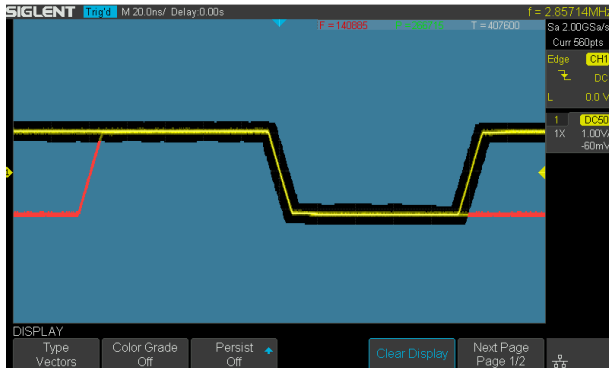
Playback the latest triggered events using the history function. Segmented memory collection will store trigger events into multiple (Up to 80,000) memory segments, each segment will store triggered waveforms and timestamp of each frame.

1 Mpoint FFT



The new math co-processor enables FFT analysis of incoming signals using up to 1 million 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.

Hardware-Based High Speed Pass/Fail function



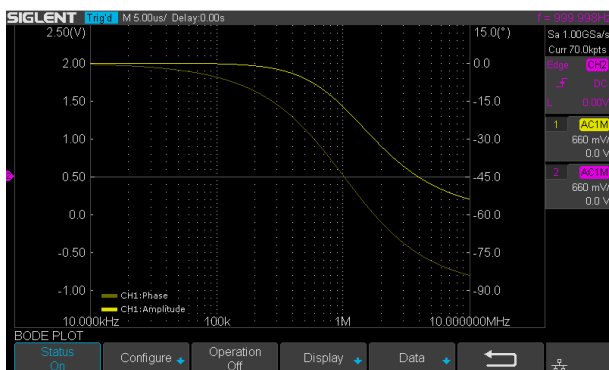
The SDS2000X-E utilizes a hardware-based Pass/Fail function, performing up to 40,000 Pass / Fail decisions each second. Easily generate user defined test templates provide trace mask comparison making it suitable for long-term signal monitoring or automated production line testing.

USB 25 MHz AWG Module (option)



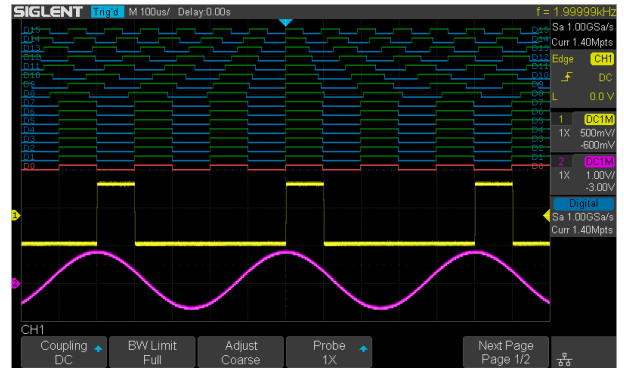
The optional 25 MHz function/arbitrary waveform generator is operated from the USB host connection. Functions include Sine, Square, Ramp, Pulse, Noise, DC and 45 additional built-in waveforms. The arbitrary waveforms can be accessed and edited by the SIGLENT EasyWave PC software.

Bode Plot



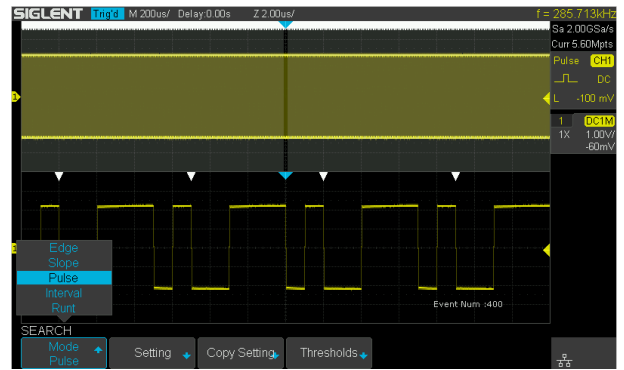
SDS2000X-E can control the USB AWG module or an independent SIGLENT SDG instrument, scan a circuits amplitude and phase frequency response, and display the data as a Bode Plot. It can also show the result lists, and export the data to a USB disk.

16 Digital Channels/MSO (option)



16 digital channels enables users to acquire and trigger on digital input channels and view both digital and analog waveforms simultaneously with one instrument.

Search and Navigate



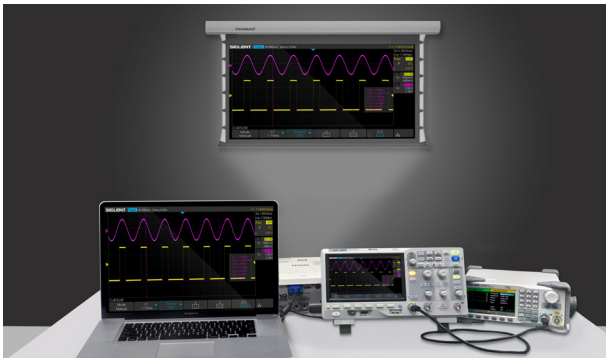
The SDS2000X-E can search events specified by the user in a frame. It can also navigate by time (delay position) and historical frames.

USB WIFI Adapter (option)



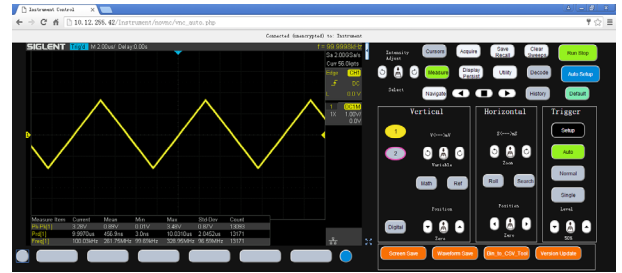
WiFi control of instrumentation can provide a convenient and safe method of configuring and collecting data. This new feature works with a SIGLENT approved WiFi adapter to provide wireless control and communications with SIGLENT SDS2000X-E scopes.

Real-time update screen in web page



With 100 Mbps LAN, the internal web page can update at a rate of up to 10 times/s, providing a nearly-real time update of 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



With the new embedded web server, users can control the SDS2000X-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.

Complete Connectivity



SDS2000X -E supports USB Host, USB Device (USB -TMC), LAN, Pass/Fail and Trigger Out.

Specifications

Acquire System

| | |
|------------------------|---|
| Sampling Rate | 2 GSa/s (single channel), 1 GSa/s (two channels) |
| Memory Depth | Max 28 Mpts/Ch (single channel), 14 Mpts/Ch(two channels) |
| Peak Detect | 1 nsec |
| 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 | 2+EXT |
| Coupling | DC, AC, GND |
| Impedance | DC 1 M Ω : (1 M Ω \pm 2%) (18 pF \pm 2 pF) DC 50 Ω : 50 Ω \pm 2% |
| Max. Input voltage | 1 M Ω : \leq 400 Vpk (DC + Peak AC \leq 10 kHz) 50 Ω : \leq 5V rms |
| CH to CH Isolation | DC-Max BW $>$ 40 dB |
| Probe attenuation | 0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X.....1000X, 2000X, 5000X, 10000X, Custom |

Vertical System

| | |
|---------------------------------------|---|
| Bandwidth (-3 dB) | 350 MHz (SDS2352X-E) 200 MHz (SDS2202X-E) |
| Vertical Resolution | 8-bit |
| Vertical Scale (Probe 1 X) | 500 μ V/div - 10 V/div (1-2-5 sequence) |
| Offset Range (Probe 1 X) | 500 μ V - 100 mV: \pm 2 V 102 mV- 1 V: \pm 20 V 1.02 V - 10 V: \pm 200 V |
| Bandwidth Limit | 20 MHz \pm 40% |
| Channel Flatness (Inner 50 Ω) | DC - 60% (BW): \pm 1 dB 60% - 100% (BW): + 1 dB/-3 dB |
| Low Frequency Response (AC -3 dB) | \leq 2 Hz (at input BNC) |
| Noise | ST-DEV \leq 0.5 division ($<$ 1 mV/div) ST-DEV \leq 0.2 division ($<$ 2 mV/div) ST-DEV \leq 0.1 division (\geq 2 mV/div) |
| SFDR including harmonics | \geq 35 dB |
| DC Gain Accuracy | \leq \pm 3.0%: 5 mV/div-10 V/div \leq \pm 4.0%: \leq 2 mV/div |
| Offset Accuracy | \pm (1% * Offset + 1.5% * 8 * div + 2 mV): \geq 2 mV/div \pm (1% * Offset + 1.5% * 8 * div + 500 μ V): \leq 1 mV/div |
| Risetime | Typical 1.0 ns (SDS2352X-E) Typical 1.8 ns (SDS2202X-E) |

Horizontal System

| | |
|-----------------------|--|
| Timebase Scale | 500 ps/div-100 s/div |
| Channel Skew | <100 ps |
| Waveform Capture Rate | Up to 110,000 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 step) |

Trigger System

| | |
|-----------------------------------|---|
| Trigger Mode | Auto, Normal, Single |
| Trigger Level | Internal: ±4.5 div from the center of the screen |
| | EXT: ±0.6 V |
| | EXT/5: ±3 V |
| Holdoff Range | 80 ns - 1.5 s |
| Trigger Coupling | AC DC LFRJ HFRJ Noise RJ |
| Coupling Frequency Response | DC: Passes all components of the signal |
| | AC: Blocks DC components and attenuates signals below 8 Hz |
| | LFRJ: Blocks the DC component and attenuates the low-frequency components below 2 MHz |
| | HFRJ: Attenuates the high-frequency components above 1.2 MHz |
| Coupling Frequency Response (EXT) | DC: Passes all components of the signal |
| | AC: Blocks DC components and attenuates signals below 10 Hz |
| | LFRJ: Blocks the DC components and attenuates low-frequency components below 6 KHz |
| Trigger Accuracy (typical) | HFRJ: Attenuates high-frequency components above 200 KHz |
| | Internal: ±0.2 div EXT: ±0.4 div |
| Trigger Sensitivity | DC - Max BW 0.6 div |
| | EXT: 200 mVpp DC – 10 MHz 300 mVpp 10 MHz - BW frequency (External 50 Ω) |
| | EXT/5: 1 Vpp DC – 10 MHz 1.5 Vpp 10 MHz -BW frequency (External 50 Ω) |
| | |
| 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 |

Slope Trigger

| | |
|------------|-----------------|
| Slope | Rising, Falling |
| LimitRange | <, >, <>, >< |
| Source | All channels |
| TimeRange | 2 ns - 4.2 s |
| Resolution | 1 ns |

| 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 |
| Search | |
| Event | Edge, Slope, Pulse, Interval, Runt |
| Event Number | Y-T: 700 ROLL: No limitation Stop After ROLL: 700 |

| 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, 6, 7, 8-bits |
| Parity Check | None, Odd, Even |
| Stop Bit | 1, 1.5, 2-bits |
| Idle Level | High, Low |
| Baud Rate (Selectable) | 600/1200/2400/4800/9600/19200/38400/57600/115200 bit/s |
| Baud Rate (Custom) | 300-5000000 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/ 50k/ 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 |

| Serial Decoder | |
|------------------------------------|--|
| Number of Decoders | 2 |
| I2C Decoder | |
| Signal | SCL, SDA |
| Address | 7, 10 bits |
| Threshold | -4.5 - 4.5 div |
| List | 1 - 7 lines |
| SPI Decoder | |
| Signal | SCL, MISO, MOSI, CS (2 channel scopes can only use 2 signal identifiers) |
| Edge Select | Rising, Falling |
| Idle Level | Low, High |
| Bit Order | MSB, LSB |
| Threshold | -4.5 - 4.5 div |
| List | 1 - 7 lines |
| UART Decoder | |
| Signal | RX, TX |
| Data Width | 5, 6, 7, 8-bits |
| Parity Check | None, Odd, Even |
| Stop Bit | 1, 1.5, 2-bits |
| Idle Level | Low, High |
| Threshold | -4.5 - 4.5 div |
| List | 1 - 7 lines |
| 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 Decoder | |
| LIN Specification Package Revision | Ver 1.3, Ver 2.0 |
| Threshold | -4.5 - 4.5 div |
| List | 1 - 7 lines |

| Measurement | | |
|-----------------------------------|--|---|
| Source | All channels, All channels in Zoom, Math, All References, History | |
| Number of Measurements | Display 4 measurements at the same time. 5 measurements displayed in statistics table | |
| Measurement Range | Screen or Gate region | |
| Measurement Parameters (38 Types) | | |
| Vertical (Voltage) | 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 a signal mode signal |
| | Top | 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 |
| | 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 |
| Horizontal (Time) | Period | Time between the middle threshold points of two consecutive, like-polarity edges |
| | Freq | Reciprocal of period |
| | +Wid | Width measured at 50% level and positive slope |
| | -Wid | Width measured at 50% level and negative slope |
| | Rise Time | Duration of rising edge from 10-90% |
| | Fall Time | Duration of falling edge from 90-10% |
| | Bwid | Time from the first rising edge to the last falling edge, or the first falling edge to the last rising edge at the 50% crossing |
| | +Dut | Time difference between the 50% threshold of a rising edge to the 50% threshold of the next falling edge of the pulse |
| | -Dut | Time difference between the 50% threshold of a falling edge to the 50% threshold of the next rising edge of the pulse |
| | 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). | |
| Delay | Phase | Phase difference between two edges |
| | 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/ Δ T) Voltage Y1, Y2, (Y1 -Y2) Track: Time X1, X2, (X1 -X2) |
| Statistics | Current, Mean, Min, Max, Stdev, Count |
| Counter | Hardware 6-digit counter (channels are selectable) |

Math Function

| | |
|-------------|--|
| Operation | + , - , * , / , FFT, d/dt, \int dt, $\sqrt{\quad}$ |
| FFT window | Rectangular, Blackman, Hanning, Hamming, Flattop |
| FFT display | Full Screen, Split, Exclusive |

USB AWG Module (option)

| | |
|-----------------------|--|
| Channel | 1 |
| Max. Output Frequency | 25 MHz |
| Sampling Rate | 125 MSa/s |
| Frequency Resolution | 1 μ Hz |
| Frequency Accuracy | \pm 50 ppm |
| Vertical Resolution | 14-bit |
| Amplitude Range | -1.5 ~ +1.5 V (50 Ω load) -3 ~ +3 V (High-Z load) |
| Waveform Type | Sine, Square, Ramp, Pulse, Noise, DC and 45 built-in waveforms |
| Output impedance | 50 Ω \pm 2% |
| Protection | Over-Voltage Protection, Current-Limiting Protection |
| Insulation Voltage | \pm 42 Vpk (for SAG2021I only) |

Sine

| | |
|------------------------------------|---|
| Frequency | 1 μ Hz ~ 25 MHz |
| Offset Accuracy (10 kHz) | \pm (1%*Offset Setting Value +3 mVpp) |
| Amplitude flatness (10 kHz, 5 Vpp) | \pm 0.3 dB |
| SFDR | DC ~ 1 MHz -60 dBc |
| | 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 μ Hz ~ 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 μ Hz ~ 300 kHz |
| Linearity (Typical) | < 0.1% of Pk-Pk (Typical, 1 kHz, 1 Vpp, 50% Symmetry) |
| Symmetry | 0% ~ 100% |

| DC | |
|----------------|-------------------------|
| Offset range | ±1.5 V (50 Ω load) |
| | ±3 V (High-Z load) |
| Accuracy | ± (offset * 1% + 3 mV) |
| Noise | |
| Bandwidth | > 25 MHz (-3 dB) |
| Arbitrary Wave | |
| Frequency | 1 μHz ~ 5 MHz |
| Wave Length | 16 kpts |
| Sampling Rate | 125 MSa/s |
| Lead In | EasyWave and U-Disk |

| Digital Channels (option) | |
|-----------------------------|--|
| No. of Channels | 16 |
| Max. Sampling Rate | 1 GSa/s |
| Memory Depth | 14 Mpts/CH |
| Min. Detectable Pulse Width | 4 ns |
| Level Group | D0 ~ D7, D8 ~ D15 |
| Level Range | -8 V ~ 8 V |
| Logic Type | TTL, CMOS, LVCMOS3.3, LVCMOS2.5, custom |
| Skew[2] | D0 ~ D15: ±1 sampling interval Digital to Analog: ± (1 sampling interval +1 ns) |

| I/O | |
|-----------|---|
| Standard | USB Host*2, USB Device, LAN, Pass/Fail, Trigger Out |
| Pass/Fail | 3.3 V TTL Output |

| Display (Screen) | |
|--------------------|------------------|
| Display Type | 7-inch TFT LCD |
| Display Resolution | 800 × 480 pixels |
| Display Color | 24-bit |
| Contrast (Typical) | 500:1 |
| Backlight | 300 nits |
| Range | 8 x 14 divisions |

| 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 |
| Language | Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Russian, Italian, Portuguese |

Environments

| | |
|-------------|--|
| Temperature | Operating: 0°C ~ +40°C |
| | Non-operating: -20°C ~ +60°C |
| Humidity | Operating: 85% RH, 40°C , 24 hours |
| | Non-operating: 85% RH, 65°C , 24 hours |
| Height | Operating: ≤3000 m |
| | Non-operating: ≤15,000 m |

Standards

| | | | |
|-------------------------------|--|------------------------------|--|
| Electromagnetic compatibility | Meets EMC directive (2014/30/EU), meets or exceeds IEC 61326-1:2012/EN61326-1:2013 (Basic) | | |
| | Conducted disturbance | CISPR 11/EN 55011 | CLASS A group 1, 150kHz-30MHz |
| | Radiated disturbance | CISPR 11/EN 55011 | CLASS A group 1, 30MHz-1GHz |
| | Electrostatic discharge (ESD) | IEC 61000-4-2/EN 61000-4-2 | 4.0 kV (Contact), 8.0 kV (Air) |
| | Radio-frequency electromagnetic field Immunity | IEC 61000-4-3/EN 61000-4-3 | 10 V/m (80 MHz to 1 GHz) 3 V/m (1.4 GHz to 2 GHz) 1 V/m (2.0 GHz to 2.7GHz) |
| | Electrical fast transients (EFT) | IEC 61000-4-4/EN 61000-4-4 | 2kV (Input AC Power Ports) |
| | Surges | IEC 61000-4-5/EN 61000-4-5 | 1kV (Line to line) 2kV (Line to ground) |
| | Radio-frequency continuous conducted Immunity | IEC 61000-4-6/EN 61000-4-6 | 3 V, 0.15-80MHz |
| Safety | Voltage dips and interruptions | IEC 61000-4-11/EN 61000-4-11 | Voltage Dips: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Voltage interruptions:0% UT during 250/300 cycles |
| | 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. | | |











Power Supply





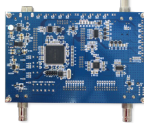

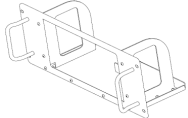
| | |
|---------------|------------------------------------|
| Input Voltage | 100 - 240 Vrms (± 10%), 50 / 60 Hz |
| | 100 - 120 Vrms (± 10%), 400 Hz |
| Power | 50W Max |

Mechanical

| | |
|------------|--------------------------|
| Dimensions | Length: 312 mm |
| | Width: 132.6 mm |
| | Height: 151 mm |
| Weight | N.W: 2.6 kg; G.W: 3.8 kg |

Probes and Accessories

| Probe | Model | Picture | Description |
|---------------|--------------------|---|--|
| Passive | PP510 |  | |
| | PP215 | | Bandwidth: 200 MHz, 1X/10X, 1 M/10 Mohm, 300 V/600 V Bandwidth: 350 MHz, 1X/10X, 1 M/1 Mohm, 150 V/300 V |
| | SP2035 | | |
| 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: 1MHz, Max. continuous current: 50Arms, Peak current: 140 A Switch Ratio: 500 mV/A, 50 mV/A Accuracy: 500 mV/A (20 mA -14ApK) \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, 9 V 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%, 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 1mA), 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/1.2 A 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 |  |
| DPB5150 | |  | Bandwidth: 70 MHz, Differential Range: 1500 V (DC + Peak AC), 50X/500X Accuracy: \pm 2%, DC 5 V/1A USB adapter |

| Probe | Model | Picture | Description |
|--------------------|------------------|---|---|
| | DPB5150A |  | Bandwidth: 100 MHz, Differential Range: 1500 V (DC + Peak AC), 50X/500X , Accuracy: $\pm 2\%$ DC 5 V/1 A USB adapter |
| | DPB5700 |  | Bandwidth: 70 MHz, Differential Range: 7000 V (DC + Peak AC), 100X/1000X , Accuracy: $\pm 2\%$, DC 5 V/1 A USB adapter |
| | DPB5700A |  | Bandwidth: 100 MHz Differential Range: 7000 V (DC + Peak AC), 100X/1000X Accuracy: $\pm 2\%$ 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: $\leq 3\%$ |
| Isolated front end | ISFE |  | Provides isolation between standard oscilloscope channels, isolation between the measured signal and ground. Uses USB 5 V power supply, plug and play. The maximum input voltage allowed is up to ± 600 Vpk |
| Demo Board | STB-3 Test Board |  | Output signals including square, sine, AM, fast edge, pulse, PWM, I2C, CAN, LIN etc. Used in teaching and demonstrations |
| USB AWG Module | SAG1021 |  | 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 |

Ordering information

| | | |
|----------------------|--|---|
| Product Name | SDS2000X-E Series Digital Oscilloscope | |
| | SDS2202X-E 200 MHz | |
| | SDS2352X-E 350 MHz | |
| Standard Accessories | USB Cable -1 | |
| | Quick Start -1 | |
| | Passive Probe -2 | |
| | Certification of Calibration -1 | |
| | Power Cord -1 | |
| Optional Accessories | 16 Channels MSO Software | SDS2000X-E-16LA |
| | 16 Channels Logic Analyzer | SLA1016 |
| | AWG Software | SDS2000X-E-FG |
| | USB Isolated AWG Module Hardware | SAG1021I |
| | WIFI Software | SDS2000X-E-WIFI |
| | USB WIFI Adapter | TL_WN725N |
| | 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 |

SDS2000X-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, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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