# Product Datasheet - Technical Specifications

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# SDS2304X / SDS2302X
# SDS2204X / SDS2202X
# SDS2104X / SDS2102X
# SDS2074X / SDS2072X

## Product Overview

SIGLENT's SDS2000X series Super Phosphor Oscilloscopes are available in bandwidths of 70MHz, 100MHz, 200MHz and 300MHz, maximum sample rate of 2GSa/s, and maximum record length of 140Mpts. The most commonly used functions can be accessed with its user-friendly one-button design.

The SDS2000X series employs a new generation of SPO technology. It has an innovative digital trigger system with high sensitivity and low jitter, and a maximum waveform capture rate of 140,000 wfm/s (normal mode), up to 500,000 wfm/s (sequence mode). It also employs not only the common 256-level intensity grading display function but also a color temperature display mode. The trigger system supports multiple powerful triggering modes including serial bus triggering. History waveform recording and sequence acquisition allow for extended waveform records to be captured, stored, and analyzed. An impressive array of measurement and math capabilities, options for a built-in 25 MHz arbitrary waveform generator, 16 digital channels (MSO), as well as serial decoding are also features of the SDS2000X.



## Key Features

- 70MHz, 100MHz, 200MHz, 300MHz models

- Real-time sampling rate up to 2GSa/s

- New generation of SPO technology

  - Waveform capture rate up to 140,000 wfm/s (normal mode), and 500,000 wfm/s (sequence mode)

  - Supports 256-level intensity grading and color temperature display

  - Record length up to 140Mpts

  - Digital trigger system

- Intelligent trigger: Edge, Slope, Pulse, Window, Runt, Interval, Dropout, Pattern and Video (HDTV supported)

- Serial bus triggering and decoder, supports protocols IIC, SPI, UART, RS232, CAN and LIN

- Low background noise, supports 1mV/div to 10V/div voltage scales

- 10 types of one-button shortcuts, including Auto Setup, Default, Cursors, Measure, Roll, History, Display/Persist, Clear Sweeps, Zoom and Print

- Segmented acquisition (Sequence) mode, dividing the maximum record length into multiple segments (up to 80,000), according to trigger conditions set by the user, with a very small dead time segment to capture the qualifying event

- History waveform record (History) function, the maximum recorded waveform length is 80,000 frames

- Automatic measurement function on 37 parameters, supports statistics, Gating measurement, Math measurement, History measurement and Ref measurement

- Math function (FFT, addition, subtraction, multiplication, division, integration, differential, square root)

- High Speed hardware based Pass/ Fail function

- 16 Digital channels (MSO), Maximum waveform capture rate up to 500 MSa/s, Record length up to 140 Mpt/CH

- 25MHz function/arbitrary waveform generator, built-in 10 types of waveforms

- Large 8 inch TFT-LCD display with 800 * 480 resolution

- Abundant interfaces: USB Host, USB Device (USBTMC), LAN (VXI-11), Pass/Fail, Trigger Out, GPIB (optional)

- Supports SCPI remote control commands

- Supports Multi-language display and embedded online help

## Models and Key Specifications

| Model | SDS2072X<br>SDS2074X | SDS2102X<br>SDS2104X | SDS2202X<br>SDS2204X | SDS2302X<br>SDS2304X |
|---|---|---|---|---|
| Bandwidth | 70 MHz | 100 MHz | 200 MHz | 300 MHz |
| Sampling Rate (Max.) | 2 GSa/s | | | |
| Channels | 2 + EXT<br>4 + EXT | | | |
| Memory Depth (Max.) | 140 Mpts (Single-Channel), 70 Mpts (Dual-Channel) | | | |
| Waveform Capture Rate (Max.) | 140,000 wfm/s (normal mode), 500,000 wfm/s (sequence mode) | | | |
| Trigger Type | Edge, Slope, Pulse width, Window, Runt, Interval, Dropout, Pattern, Video | | | |
| Serial Trigger | IIC, SPI, UART/RS232, CAN, LIN | | | |
| Decoder Type (Optional) | IIC, SPI, UART/RS232, CAN, LIN | | | |
| 16 Digital Channels (MSO Option) | Maximum waveform capture rate up to 500 MSa/s, Record length up to 140 Mpts/CH | | | |
| Waveform Generator (Optional) | Single channel, Max. frequency up to 25MHz, 125MSa/s sampling rate, 16Kpts wave length | | | |
| I/O | USB Host, USB Device, LAN, Pass/Fail, Trigger Out, GPIB (Optional) | | | |
| Probe (Std) | PB470 70MHz<br>1 pcs for each channel | PP510 100MHz<br>1 pcs for each channel | SP2030A 300MHz<br>1 pcs for each channel | SP2030A 300MHz<br>1 pcs for each channel |
| Display | 8 inch TFT LCD (800x480) | | | |

## Functions & Characteristics

**8 inch TFT-LCD Display and 10 One-button Menus**



- 8-inch TFT-LCD display with 800 * 480 resolution
- Most commonly used functions are accessible using 10 different one-button operation keys: Auto Setup, Default, Cursors, Measure, Roll, History, Display/Persist, Clear Sweeps, Zoom and Print
- Supports auto detection of 10X probe with read-out port

# Functions & Characteristics

## 〰 Waveform Capture Rate up to 500,000wfm/s



With a waveform capture rate of up to 500,000 wfm/s (sequence mode), the oscilloscope can easily capture the unusual or low-probability events

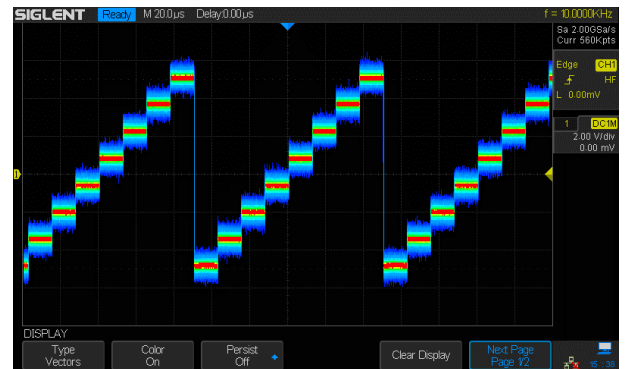## 〰 Record Length of up to 140Mpts



Using hardware-based Zoom technique and record length of up to 140Mpts, users are able to use a higher sampling rate to capture more of the signal, and then quickly zoom in to focus on the area of interest

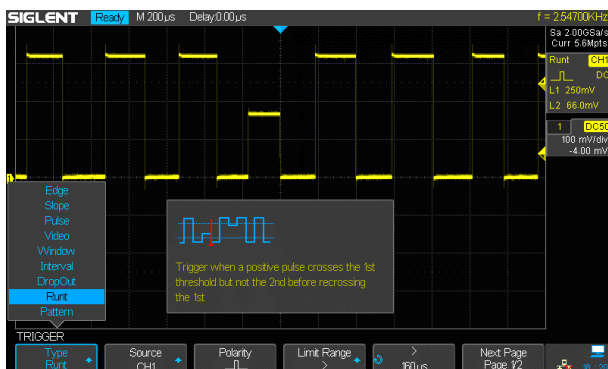## 〰 256-level Intensity Grading and Color Temperature Display
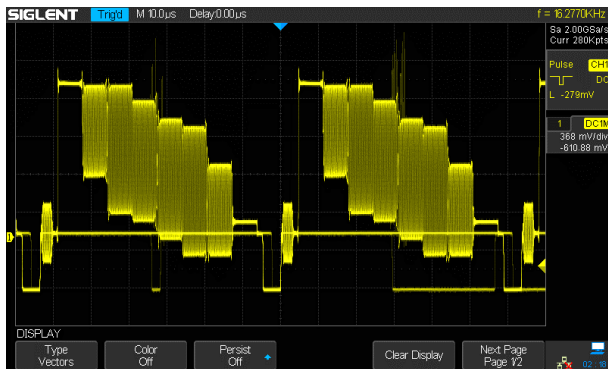


256-level intensity grading display on waveform
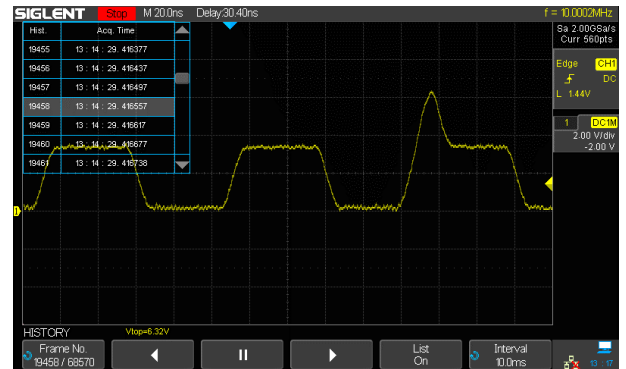


Color temperature display

## 〰 Abundant Trigger Functions



Edge, Slope, Pulse, Video, Windows, Runt, Interval, Dropout, Pattern, IIC, SPI, UART/RS232, LIN and CAN

## 〰 History Mode



History function can record up to 80,000 frames of waveforms. The recording is executed automatically, so that the customer can play back the history waveforms at any time to observe unusual events, and locate the source quickly through the cursors or measurements. Located on the keyboard Panel, this function is easily accessible

## Sequence Mode



Segmented memory collection will store the waveform into multiple (up to 80,000) memory segments and each segment will store a triggered waveform, as well the dead time information. The dead time between segments could be as small as 2μs. All the segments can be play back using History function.

## Advanced Math Function
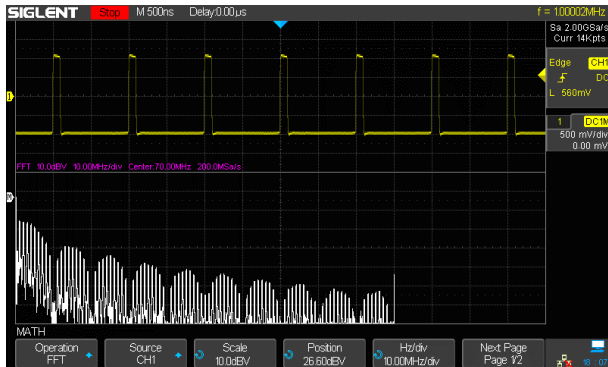


In addition to the traditional (+, -, X, /) operations, FFT, integration, differential, and square root operations are supported. The integration operation supports gating, which uses cursors to define the domain of integration

## Hardware-Based High Speed Pass/Fail Function
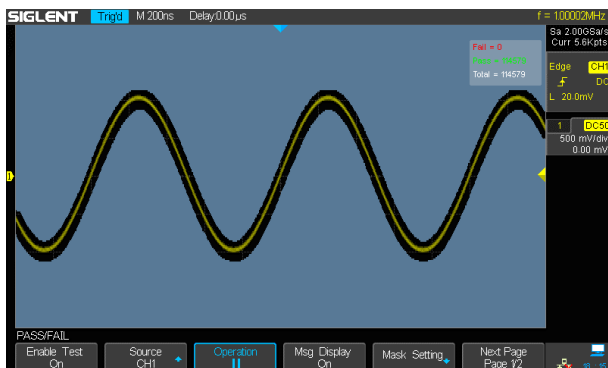


Hardware-based Pass/Fail function performs up to 140,000 Pass/ Fail decisions each second. With easy-to-generate user-defined test templates, the SDS2000X compares the current measured trace to the template mask trace, making it suitable for long-term signal monitoring or automated testing.

## Comprehensive Statistical Functions
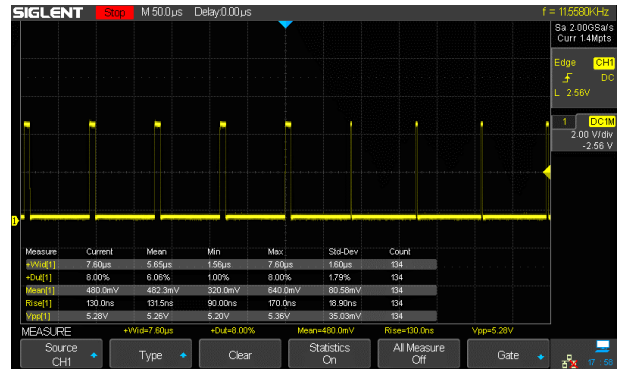


Parametric statistical functions to display 5 parameters of any measurements: current, mean, minimum value, maximum value, and standard deviation. The measurement count is also displayed. The maximum number of measurements that can be run and simultaneously analyzed statistically is five. Supports Gating measurements, Math measurement, History measurement and Ref measurement

## Eres Mode



Eres mode can improve the SNR effectively, without the dependence on the periodicity of signal and stable triggering

## Serial Bus Decoding Function (Optional)
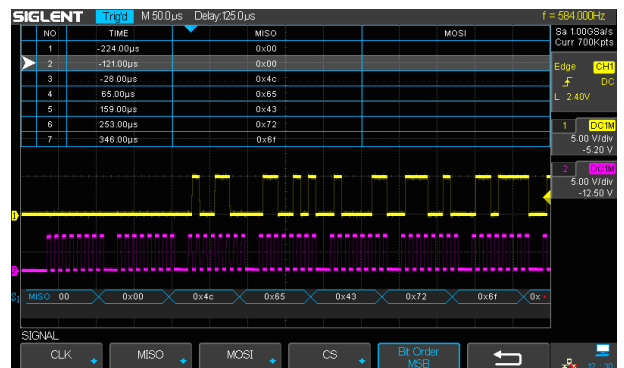


Displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in table form

### ⌁ Built-in 25MHz Function/Arbitrary Waveform Generator (Optional)



10 built-in waveforms plus 4 ARBs. The arbitrary waveforms can be accessed and edited by the EasyWave PC software

### ⌁ Complete Connectivity



USB Host, USB Device (USBTMC), LAN(VXI-11), Pass/Fail, Trigger Out and GPIB (optional)

## Specifications

All specifications are not guaranteed unless the following conditions are met:
• The oscilloscope calibration period is valid
• The oscilloscope has been working continuously for at least 30 minutes at the specified temperature (18℃ ~ 28℃ )

| Acquire System | |
|---|---|
| Sampling Rate | 2GSa/s (single-channel[1]), 1GSa/s (dual-channel) |
| Memory Depth | 140Mpts (single-channel),  70Mpts (dual-channel) |
| Peak Detect | 1ns |
| Average | Averages: 4, 16, 32, 64, 128, 256, 512, 1024 |
| Eres | Enhance bits: 0.5, 1, 1.5, 2., 2.5, 3 selectable |
| Interpolation | Sinx/x, Linear |

| Input | |
|---|---|
| Channel | 2/4 + EXT |
| Coupling | DC, AC, GND |
| Impedance | DC: (1MΩ±2%) \|\| (22pF ±3pF)<br>AC: (1.2MΩ±2%) \|\| (22pF ±3pF)<br>50Ω: 50Ω±2% |
| Max. Input voltage | 1MΩ ≤400Vpk (DC + Peak AC <=10kHz)<br>50Ω ≤5Vrms |
| CH to CH Isolation | DC~Max BW >35dB |
| Probe Attenuation | 0.1X, 0.2X, 0.5X, 1X, 2X, 5X, 10X, 20X, 50X, 100X, 200X, 500X, 1000X, 2000X, 5000X, 10000X |

| Horizontal System | |
|---|---|
| Time Scale | 1.0ns/div ~ 50s/div |
| Channel Skew | <100ps |
| Waveform Capture Rate | Up to 140,000 wfm/s (normal mode), 500,000 wfm/s (sequence mode) |
| Intensity grading | 256-level |
| Display Format | Y-T,  X-Y, Roll |
| Time base Accuracy | ±25ppm |
| Roll Mode | 50ms/div ~ 50s/div (1-2-5 Step) |

## Vertical System

| | |
|---|---|
| Bandwidth (-3dB) | 300MHz (SDS2304X/ SDS2302X)<br>200MHz (SDS2204X/ SDS2202X)<br>100MHz (SDS2104X/ SDS2102X)<br>70 MHz (SDS2074X/ SDS2072X) |
| Vertical Resolution | 8 bit |
| Vertical Range | 8 divisions |
| Vertical Scale (Probe 1X) | 1mV/div - 10V/div (1-2-5 step) |
| Offset Range (Probe 1X) | 1mV/div ~ 100mV/div: ±1V<br>102mV/div ~ 1V/div: ±10V<br>1.02V/div ~ 10V/div: ±100V |
| Bandwidth Limit | 20MHz ±40% |
| Bandwidth Flatness | DC ~ 10%(BW): ±1dB<br>10% ~ 50%(BW): ±2dB<br>50% ~ 100%(BW): +2dB/-3dB |
| Low Frequency Response (AC Coupling -3dB) | ≤10Hz (at input BNC) |
| Noise | stdev ≤ 0.2 div (< 2mV/div)<br>stdev ≤ 0.5 div (≥ 2mV/div) |
| DC Gain Accuracy | 5mV/div ~10V/div:  ≤3.0%<br>≤2mV/div: ≤4.0% |
| Offset Accuracy | ≥2mV/div: ±(1%*offset+1.5%*8*div+2mV)<br><2mV/div: ±(1%* offset +1.5%*8*div+1mV) |
| Rise Time [1] | <1.2ns (SDS2304X/ SDS2302X))<br><1.7ns (SDS2204X/ SDS2202X)<br><3.5ns (SDS2104X/ SDS2102X)<br><5.0ns (SDS2074X/ SDS2072X) |
| Overshoot (500ps Rise Edge) | <10% |

## Trigger System

| | |
|---|---|
| Mode | Auto, Normal, Single |
| Level | Internal: ±4.5div from the center of the screen<br>EXT: ±0.6V<br>EXT/5: ±3V |
| Holdoff Range | 100ns ~ 1.5s |
| Coupling | AC, DC, LFRJ, HFRJ, Noise RJ (CH1~CH4) |
| Coupling Frequency Response (CH1~CH4)[2] | DC: Passes all components of the signal<br>AC: Blocks DC components and attenuates signals below 8Hz<br>LFRJ: Attenuates the frequency components below 900kHz<br>HFRJ: Attenuates the frequency components above 500kHz |
| Coupling Frequency Response (EXT) [2] | DC: Passes all components of the signal<br>AC: Blocks DC components and attenuates signals below 8Hz<br>LFRJ: Attenuates the frequency components below 400kHz<br>HFRJ: Attenuates the frequency components above 1MHz |
| Accuracy[2] | CH1 ~ CH4: ±0.2div<br>EXT: ±0.3div |
| Sensitivity | CH1~ CH4: 0.6div<br>EXT: 200mVpp (DC~ 10MHz)<br>        300mVpp (10MHz~ BW)<br>EXT/5: 1Vpp (DC~ 10MHz)<br>        1.5Vpp (10MHz~ BW) |
| Jitter | <100ps (CH1~ CH4) |
| Displacement | Pre-Trigger: 0 ~ 100% memory<br>Delay-Trigger: 0 ~ 2,000 div |
| **Edge Trigger** | |
| Slope | Rising, Falling, Rising&Falling |
| Source | CH1~CH4/EXT/(EXT/5)/AC Line |
| **Slope Trigger** | |
| Slope | Rising, Falling |
| Limit Range | <, >, < >, > < |
| Source | CH1 ~ CH4 |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |

**Pulse Width Trigger**

| | |
|---|---|
| Polarity | +wid , -wid |
| Limit Range | <, >, < >, > < |
| Source | CH1~CH4 |
| Pulse Width Range | 2ns ~ 4.2s |
| Resolution | 1ns |

**Video Trigger**

| | |
|---|---|
| Signal Standard | NTSC, PAL, 720p/50, 720p/60, 1080p/50, 1080p/60, 1080i/50, 1080i/60, Custom |
| Source | CH1~CH4 |
| Sync | Any, Select |
| Trigger Condition | Line, Field |

**Window Trigger**

| | |
|---|---|
| Window Type | Absolute, Relative |
| Source | CH1~CH4 |

**Interval Trigger**

| | |
|---|---|
| Slope | Rising, Falling |
| Limit Range | <, >, < >, > < |
| Source | CH1~CH4 |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |

**Dropout Trigger**

| | |
|---|---|
| Timeout Type | Edge, State |
| Source | CH1~CH4 |
| Slope | Rising, Falling |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |

**Runt Trigger**

| | |
|---|---|
| Polarity | +wid , -wid |
| Limit Range | <, >, < >, > < |
| Source | CH1~CH4 |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |

**Pattern Trigger**

| | |
|---|---|
| Pattern Setting | Invalid, Low, High |
| Logic | AND, OR, NAND, NOR |
| Source | CH1~CH4 |
| Limit Range | <, >, < >, > < |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |

## Serial Trigger

**IIC Trigger**

| | |
|---|---|
| Condition | Start, Stop, Restart, No Ack, EEPROM, Address&Data, Data Length |
| Source (SDA/SCL) | CH1~CH4 |
| Data format | Hex |
| Limit Range | EEPROM: =, >, < |
| Data Length | EEPROM: 1byte<br>Address&Data: 1~2byte<br>Data Length: 1~12byte |
| R/W bit | Address&Data: Read, Write, Do not care |

**SPI Trigger**

| | |
|---|---|
| Condition | Data |
| Source (CS/CLK/Data) | CH1~CH4 |
| Data format | Binary |
| Data Length | 4 ~ 96 bit |
| Bit Value | 0, 1, X |
| Bit Order | LSB, MSB |

## UART/RS232 Trigger

| | |
|---|---|
| Condition | Start, Stop, Data, Parity Error |
| Source (RX/TX) | CH1~CH4 |
| 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) | 600/1200/2400/4800/9600/19200/38400/57600/115200 bit/s |
| Baud Rate (Custom) | 300bit/s~334000bit/s |

## CAN Trigger

| | |
|---|---|
| Type | All, Remote, ID, ID+Data, Error |
| Source | CH1~CH4 |
| ID | STD (11bit), EXT(29bit) |
| Data format | Hex |
| Data Length | 1~2byte |
| Baud Rate (Selectable) | 5k/10k/20k/50k/100k/125k/250k/500k/800k/1M bit/s |
| Baud Rate (Custom) | 5kbit/s~1Mbit/s |

## LIN Trigger

| | |
|---|---|
| Type | Break, Frame ID, ID+Data, Error |
| Source | CH1~CH4 |
| ID | 1byte |
| Data format | Hex |
| Data Length | 1~2byte |
| Baud Rate (Selectable) | 600/1200/2400/4800/9600/19200 bit/s |
| Baud Rate (Custom) | 300bit/s~20kbit/s |

## Serial Decoder (Optional)

| | |
|---|---|
| No. of Decoder | 2 |

### IIC Decoder

| | |
|---|---|
| Signal | SCL, SDA |
| Address | 7bit, 10bit |
| Threshold | -4.5~4.5div |
| List | 1~7 Lines |

### SPI Decoder

| | |
|---|---|
| Signal | CLK, MISO, MOSI, CS |
| Edge Select | Rising, Falling |
| Idle Level | Low, High |
| Bit Order | MSB, LSB |
| Threshold | -4.5~4.5 div |
| List | 1 ~ 7 lines |

### UART/ RS232 Decoder

| | |
|---|---|
| Signal | RX, TX |
| 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 | 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 | Ver1.3, Ver2.0 |
| Threshold | -4.5 ~ 4.5 div |
| List | 1 ~ 7 lines |

## Measurement

| | |
|---|---|
| Source | CH1~CH4, Math, Ref, History |
| No. of Measurements | Display 5 measurements at the same time |
| Range | Screen, Gating |

**Measurement Parameters (37 Types)**

| | | |
|---|---|---|
| Vertical (Voltage) | Vmax | Highest value in input waveform |
| | Vmin | Lowest value in input waveform |
| | Vpp | Difference between maximum and minimum data values |
| | Vamp | Difference between top and base in a bimodal signal, or between max and min in an unimodal signal |
| | Vtop | Value of most probable higher state in a bimodal waveform |
| | Vbase | Value of most probable lower state in a bimodal waveform |
| | Mean | Average of all data values |
| | Vmean | Average of data values in the first cycle |
| | stdev | Standard deviation of all data values |
| | Vstd | 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 | Period for every cycle in waveform at the 50% level, and positive slope |
| | Freq | Frequency for every cycle in waveform at the 50% level, and positive slope |
| | +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 | 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 trigger of each transition at a specific level and slope |

## Measurement

| | | |
|---|---|---|
| Delay | Phase | Calculate the phase difference between two edges |
| | FRR | Time between the first rising edges of the two channels |
| | FRF | Time from the first rising edge of channel A, to the first falling edge of channel B |
| | FFR | Time from the first falling edge of channel A, to the first rising edge of channel B |
| | FFF | Time from the first falling edge of channel A, to the 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 |
| Cursors | Manual : Time X1, X2, (X1-X2), (1/ΔT)<br>　　　　　Voltage Y1, Y2, (Y1-Y2)<br>Track: Time X1, X2, (X1-X2) | |
| Statistics | Current, Mean, Min, Max, Std-Dev, Count | |
| Counter | ±1Hz counter error | |

## Math

| | |
|---|---|
| Operation | +, -, *, /, FFT, d/dt, ∫dt, square root |
| FFT Window | Rectangular, Blackman, Hanning, Hamming |
| FFT Display | Full Screen, Split |

## Built-in Function/Arbitrary Waveform Generator (Optional)

| | |
|---|---|
| Channel | 1 |
| Max. Output Frequency | 25MHz |
| Sampling Rate | 125 MSa/s |
| Frequency Resolution | 1 μHz |
| Frequency Accuracy | ±50 ppm |
| Vertical Resolution | 14 bits |
| Amplitude Range | 2mVpp ~ 3Vpp (into 50Ω)<br>4mVpp ~ 6Vpp (into HiZ) |
| Waveforms | Sine, Square, Ramp, Pulse, DC, Noise, Cardiac, Gaus Pulse, Exp Rise, Exp Fall, Arb |
| Output Impedance | 50Ω±2% |
| Protection | Short-Circuit Protection |
| **Sine** | |
| Frequency | 1μHz ~ 25MHz |
| Offset Accuracy (100 kHz) | ±(0.3dB* offset setting value +1mVpp) |
| Amplitude Flatness<br>(Compare to 100 kHz, 5Vpp) | ±0.3 dB |
| SFDR | DC ~ 1 MHz　　　-60dBc<br>1 MHz ~ 5 MHz　-55dBc<br>5 MHz ~ 25 MHz　-50dBc |
| HD | DC-5 MHz　　　　-50dBc<br>5 MHz - 25MHz　　-45dBc |

### Square/Pulse

| | |
|---|---|
| Frequency | 1µHz ~ 10MHz |
| Duty Cycle | 20% ~ 80% |
| Rise/Fall time | < 24 ns (10% ~ 90%) |
| Overshoot | < 3% (typical, 1KHz, 1Vpp) |
| Pulse Width | > 50ns |
| Jitter (Cycle to Cycle) | < 500ps + 10ppm |

### Ramp

| | |
|---|---|
| Frequency | 1µHz ~ 300kHz |
| Linearity (Typical) | < 0.1% of Pk-Pk (Typical, 1 kHz, 1 Vpp, 100% Symmetry) |
| Symmetry | 0% ~ 100% |

### DC

| | |
|---|---|
| Offset range | ±1.5V (into 50Ω)<br>±3 V (into HiZ) |
| Accuracy | ±(\|offset\|*1%+3 mV) |

### Noise

| | |
|---|---|
| Bandwidth | >25MHz (-3dB) |

### Arb

| | |
|---|---|
| Frequency | 1µHz ~ 5MHz |
| Wave Length | 16Kpts |
| Sampling Rate | 125MSa/s |
| Waveform Import | EasyWave, U-Disk |

## Digital Channels

| | |
|---|---|
| No. of Channels | 16 |
| Max. Sampling Rate | 500MSa/s |
| Memory Depth | 14Mpts/CH |
| Min. Detectable Pulse Width | 4ns |
| Level Group | D0~D7,D8~D15 |
| Level Range | -3V~3V |
| Logic Type | TTL, CMOS, LVCMOS3.3, LVCMOS2.5, custom |
| Skew[2] | D0~D15: ±1 sampling interval<br>Digital to Analog: ± (1 sampling interval +1ns) |

## I/O

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

## Display

| | |
|---|---|
| Display Type | 8-inch TFT LCD |
| Resolution | 800×480 |
| Color | 24 bit |
| Contrast | 500:1 |
| Backlight | 300nit |
| Range | 8 x 14 divisions |

## Waveform Display

| | |
|---|---|
| Type | Dot, Vector |
| Persistence Time | OFF, 1s, 5s, 10s, 30s, infinite |
| Color Display | Normal, Color |
| Screen Saver | 1min, 5min, 10min, 30min, 1hour, OFF |

## Language

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

## Environments

| | |
|---|---|
| Temperature | Operating: 10℃ ~ 40℃<br>Non-operating: -20℃ ~ 60℃ |
| Humidity | Operating: 85%RH, 40℃ , 24 hours<br>Non-operating: 85%RH, 65℃ , 24 hours |
| Altitude | Operating: ≤3,000m<br>Non-operating: ≤15,266m |
| Electromagnetic Compatibility | 2004/108/EC<br>Execution Standard EN 61326-1:2006<br>EN 61000-3-2:2006 + A2:2009,  EN 61000-3-3:2008 |
| Safety | 2006/95/EC<br>Execution Standard EN 61010-1:2010/EN 61010-2-030:2010 |

## Power Supply

| | |
|---|---|
| Input Voltage & Frequency | 100 ~ 240 Vrms 50/60Hz |
| | 100 ~ 120 Vrms 400Hz |
| Power | 60W Max |

## Mechanical

| | |
|---|---|
| Dimensions | Length* Width*Height = 352mm*128mm*224mm |
| Weight | N.W 3.4 Kg(2-ch); 3.6 Kg(4-ch)<br>G.W 4.9 Kg(2-ch); 5.2 Kg(4-ch) |

Note[1]　　Single-channel: one channel in CH1/CH2 (or CH3/CH4) is ON and another is OFF
　　　　　Dual-channel: both channels in CH1/CH2 (or CH3/CH4) are ON
Note[2]　　Typical Value refers to the tested value under specific conditions. It might vary with the ambient temperature or other conditions

## SDS2000X Probes

| Probe type | Model | Picture | Description |
|---|---|---|---|
| Passive | PB470 |  | PB470, 70MHz bandwidth, 1X/10X (SDS2072X/SDS2074X) PP510, 100MHz bandwidth, 1X/10X (SDS2102X/SDS2104X) SP2030A, 300MHz bandwidth, 10X (SDS2202X/SDS2204X, SDS2302X/ SDS2304X) |
| | PP510 | | |
| | SP2030A | | |
| Logic Probe | SPL2016 |  | 16 Channel Logic Probe |
| Current | CP4020 |  | Bandwidth: 100KHz , Max. continuous current: 20Arms, Peak current: 60A Switch Ratio: 50mV/A, 5mV/A, Accuracy: 50mV/A (0.4A-10ApK)±2%, 5mV/A (1A-60ApK) ±2%, 9V battery source |
| | CP4050 |  | Bandwidth: 1MHz , Max. continuous current: 50Arms, Peak current: 140A Switch Ratio: 500mV/A, 50mV/A Accuracy: 500mV/A (20mA-14ApK)±3%±20mA , 50mV/A (200mA-100ApK) ±4%±200mA, 50mV/A (100A-140ApK) ±15%max, 9V battery source |
| | CP4070 |  | Bandwidth: 150KHz , Max. continuous current: 70Arms, Peak current: 200A Switch Ratio: 50mV/A, 5mV/A, Accuracy: 50mV/A (0.4A-10ApK)±2% , 5mV/A (1A-200ApK) ±2%, 9V battery source |
| | CP4070A |  | Bandwidth: 300KHz , Max. continuous current: 70Arms, Peak current: 200A Switch Ratio: 100mV/A, 10mV/A, Accuracy: 100mV/A (50mA-10ApK)±3%±50mA , 10mV/A (500mA-40ApK) ±4%±50mA, 10mV/A (40A-200ApK) ±15% max., 9V battery source |
| | CP5030 |  | Bandwidth: 50MHz , Max. continuous current: 30Arms, Peak current: 50A Switch Ratio: 100mV/A, 1V/A, Accuracy: 1V/A (±1%±1mA), 100mV/A (±1%±10mA), DC12V/1.2A power adapter |
| | CP5030A |  | Bandwidth: 100MHz , Max. continuous current: 30Arms, Peak current: 50A Switch Ratio: 100mV/A, 1V/A, Accuracy: 1V/A (±1%±1mA), 100mV/A (±1%±10mA), DC12V/1.2A power adapter |
| | CP5150 |  | Bandwidth: 12MHz , Max. continuous current: 150Arms, Peak current: 300A Switch Ratio: 100mV/A, 10mV/A, Accuracy: 100mV/A (±1%±10mA), 10mV/A (±1%±100mA), DC12V/1.2A power adapter |
| | CP5500 |  | Bandwidth: 5MHz , Max. continuous current: 500Arms, Peak current: 750A Switch Ratio: 100mV/A, 10mV/A, Accuracy: 100mV/A (±1%±10mA), 10mV/A (±1%±100mA), DC12V/1.2A power adapter |
| High Voltage Differential | DPB4080 |  | Bandwidth: 50MHz, Differential Range: 800V (DC + Peak AC), 100X/200X/500X/1000X, Accuracy: ±1%, DC 9V/1A power adapter |
| | DPB5150 |  | Bandwidth: 70MHz, Differential Range: 1500V (DC + Peak AC),50X/500X Accuracy: ±2%, DC 5V/1A USB adapter |
| | DPB5150A |  | Bandwidth: 100MHz, Differential Range: 1500V (DC + Peak AC), 50X/500X , Accuracy: ±2% DC 5V/1A USB adapter |

| Probe type | Model | Picture | Description |
|---|---|---|---|
| High Voltage Differential | DPB5700 | | Bandwidth: 70MHz, Differential Range: 7000V (DC + Peak AC), 100X/1000X , Accuracy: ±2%, DC 5V/1A USB adapter |
| | DPB5700A | | Bandwidth: 100MHz Differential Range: 7000V (DC + Peak AC), 100X/1000X Accuracy: ±2% DC 5V/1A USB adapter |
| High Voltage | HPB4010 | | Bandwidth: 40MHz Differential Range: DC 10KV, AC (rms): 7KV (sine), AC (Vpp): 20KV (Pulse) 1000X Accuracy: ≤3% |
| Near-field Probe | SRF5030 | | Frequency Range: 30MHz~3GHz Resolution: 25mm Check the 10cm range of magnetic field |
| Amplifier | EM5020 | | Frequency Range: 9KHz~3GHz Max. Linear Output Power: 10dBm Typical Gain: 30dB Max. Input Power: 15dBm |

# Ordering Information

| Description | Model |
|---|---|
| 300MHz, 4CH, 2GSa/s (Max.), 140Mpts | SDS2304X |
| 300MHz, 2CH, 2GSa/s (Max.), 140Mpts | SDS2302X |
| 200MHz, 4CH, 2GSa/s (Max.), 140Mpts | SDS2204X |
| 200MHz, 2CH, 2GSa/s (Max.), 140Mpts | SDS2202X |
| 100MHz, 4CH, 2GSa/s (Max.), 140Mpts | SDS2104X |
| 100MHz, 2CH, 2GSa/s (Max.), 140Mpts | SDS2102X |
| 70MHz, 4CH, 2GSa/s (Max.), 140Mpts | SDS2074X |
| 70MHz, 2CH, 2GSa/s (Max.), 140Mpts | SDS2072X |
| **Standard Accessories** | |
| USB Cable -1 | |
| Passive Probe -2 (2-ch model); -4 (4-ch model) | |
| Power Cord -1 | |
| CD (Including User Manual and EasyScopeX software) -1 | |
| Quick Start -1 | |
| Certification -1 | |
| Certificate of Calibration -1 | |
| **Optional Accessories** | |
| SDS-2000X-DC | IIC, SPI, UART/RS232, CAN, LIN Decoder |
| SDS-2000X-FG | 25MHz Function/Arbitrary Waveform Generator |
| SDS-2000X-PA | Power Analyze Software |
| SDS-2000X-16LA | 16 Digital Channels（Software） |
| SPL2016 | 16 Channel Logic Probe |
| USB-GPIB | USB-GPIB Adapter |
| ISFE | Isolated Front End |
| STB | STB Demo Source |
| DF2001A | Power analysis Deskew Fixture |
| HPB4010 | High Voltage Probe |
| CP4020/CP4050/CP4070/ CP4070A/CP5030/ CP5030A/CP5150/CP5500 | Current Probe |
| DPB4080/DPB5150/ DPB5150A/DPB5700/ DPB5700A | High Voltage Differential Probe |