

DATENBLATT

SDS2000-Serie

HABEN SIE FRAGEN ODER WÜNSCHEN SIE EIN INDIVIDUELLES ANGEBOT?

Unser Team berät Sie gerne persönlich.

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ADRESSE

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SDS2000 Series Digital Oscilloscope

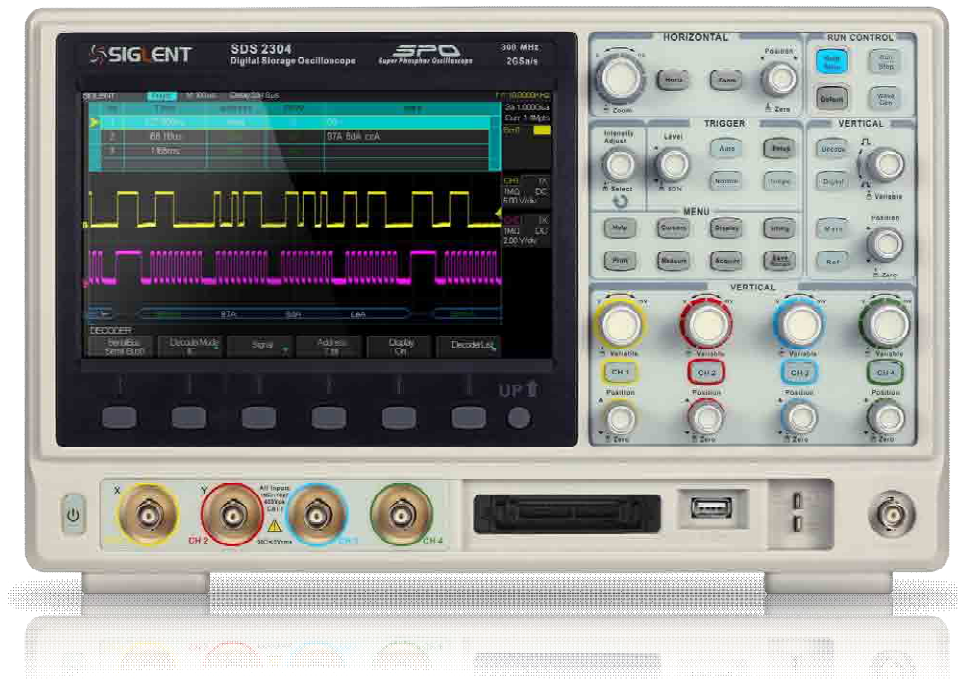


- Innovative SPO technology
- Long Memory Depth up to 28Mpts
- Waveform capture rate up to 110,000 wfs/s
- Zoom function based on the hardware technology
- Advanced math operations(FFT,d/dt,integrate,square root)
- Built-in waveform generator with the max frequency 25MHz
- Up to 256 levels intensity grading waveform display and color display
- A variety of serial trigger and decode functions(I2C,SPI,UART,CAN,LIN)
- A variety of smart trigger functions(Pattern,Window,Interval,Dropout,Runt)

SDS2000 Series Digital Oscilloscope

Overview

SDS2000 Series is an advanced technology and high performance digital oscilloscope to meet customer's applications with its innovative SPO technology, powerful digital trigger function, serial decode function and logic analyzer.



Innovative SPO Technology

- Higher waveform capture rate(Up to 110,000 wfs/s)
- Up to 256 levels intensity grading waveform display and color display
- Long memory up to 28Mpts
- Digital Trigger function

Main Features

- Innovative SPO technology
- 8 inch TFT LCD(800x480)
- Bandwidth 70MHz,100MHz,200MHz,300MHz
- Max.Sample Rate 2GSa/s
- Smart Trigger functions: Window,RunT,Interval,DropOut,Pattern
- Serial decode/trigger functions(I2C,SPI,UART,RS232,CAN,LIN)
- Support HDTV video trigger function
- Zoom function based on hardware technology
- High speed P/F function based on hardware technology
- 32 kinds built-in measurements and a measurement statistics display,
- Built-in waveform (10 kinds) generator with the max.frequency 25MHz.
- Advanced math operations(FFT,d/dt,integrate,square root)
- Complete connectivities:USB Host,USB Device(USBTMC,PictBridge), LAN(VXI-11) ,GPIB,Pass/Fail,Trigger Out
- Support SCPI remote control commands
- Multi language user interface and built-in online help system.

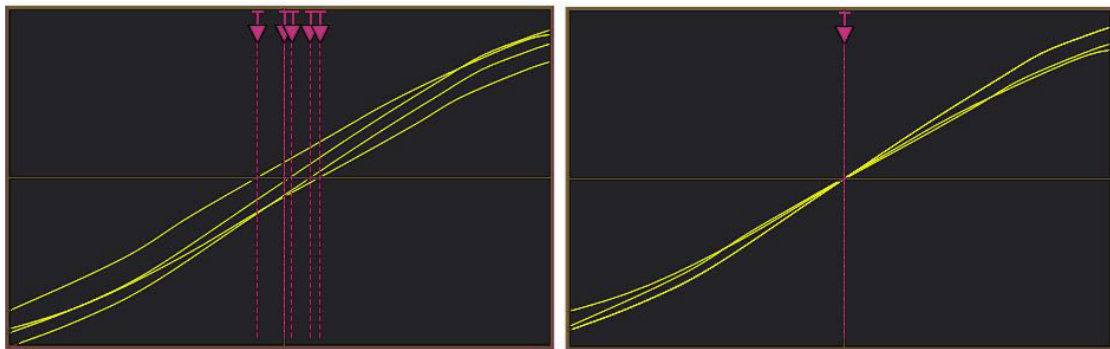
Digital Trigger function

Base on hardware technology, SDS2000 series realized digital trigger system with its high triggering sensitivity, low trigger jitter, and supports smart trigger function, HDTV video trigger and serial trigger function.

Superiority

- Precisely trigger
- Low trigger jitter
- High trigger sensitivity
- 1ns trigger timing
- Configurable Noise Reject
- High stability, not affected by temperature

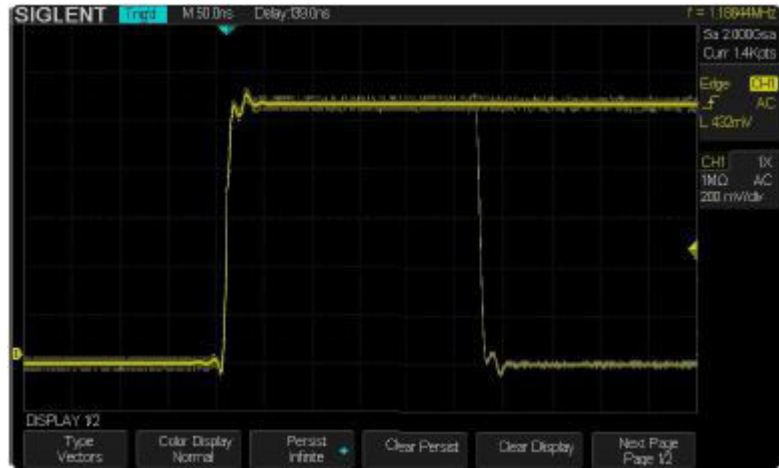
Jitter compare between Analog and Digital trigger



Function & Characteristic

Waveform capture rate up to 110,000 wf/s

The higher capture rate can improve the ability of capturing abnormal event or low probability event.



Up to 256 levels intensity grading waveform display

View the brightness of waveform easily focus on low probability event or occasional event.



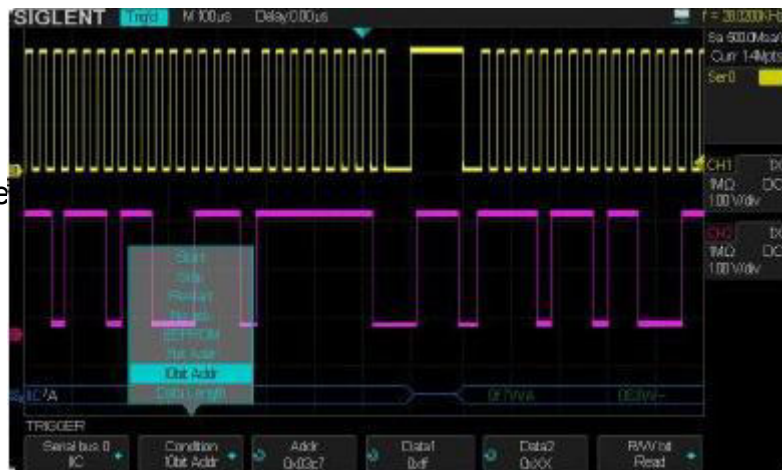
Memory Depth up to 28Mpts

The 2Gsa/S, 28Mpts architecture provides the ability to capture a fast transient or a long acquisition.



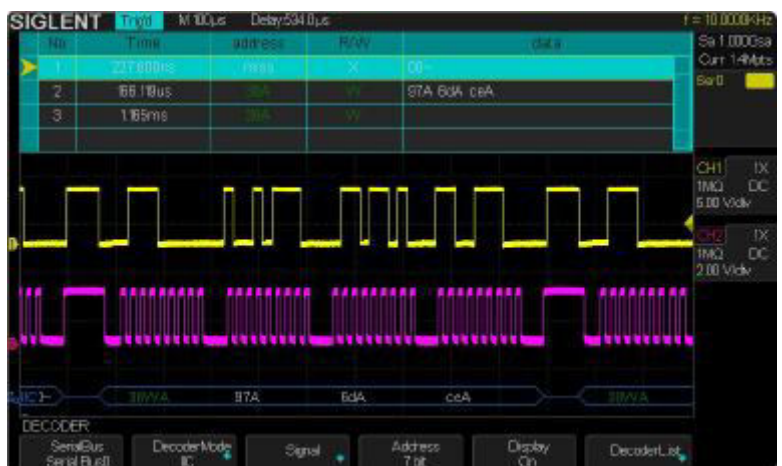
Serial Trigger functions (Option)

The serial trigger will quickly isolate events on a bus eliminating the need to set manual triggers and hoping to catch the right info.



Serial Decode functions (Option)

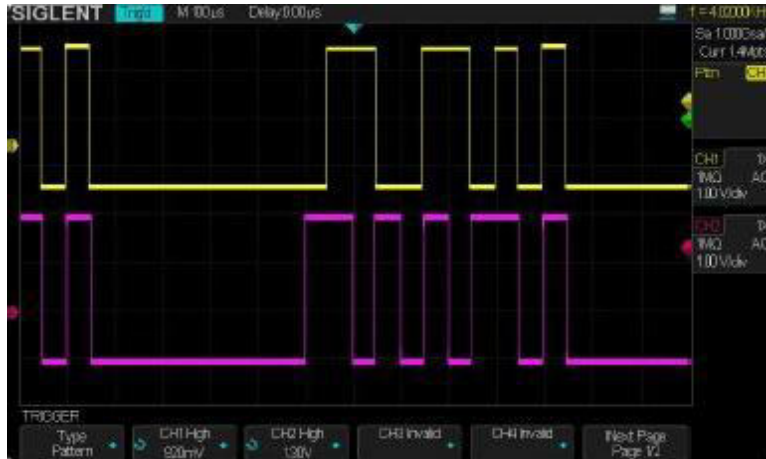
Protocol decoding is shown directly on the waveform with an intuitive, color-coded overlay and presented in hex.



Smart Trigger Functions

SDS2000 series support a variety of smart trigger functions, such as Window, Interval, Runt, DropOut, Pattern.

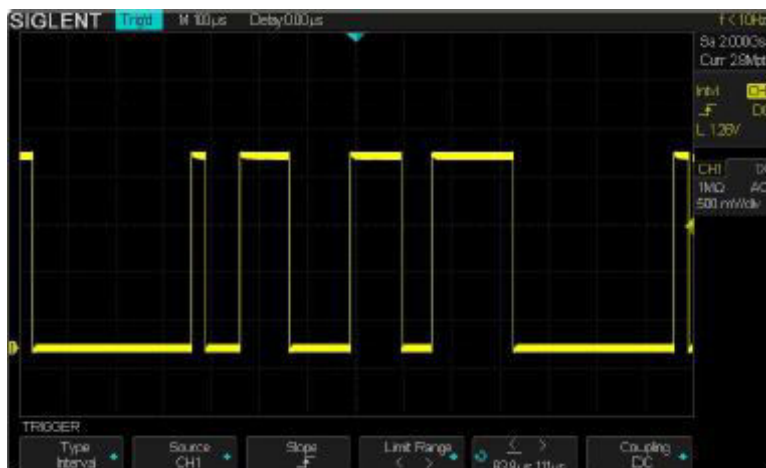
Pattern trigger



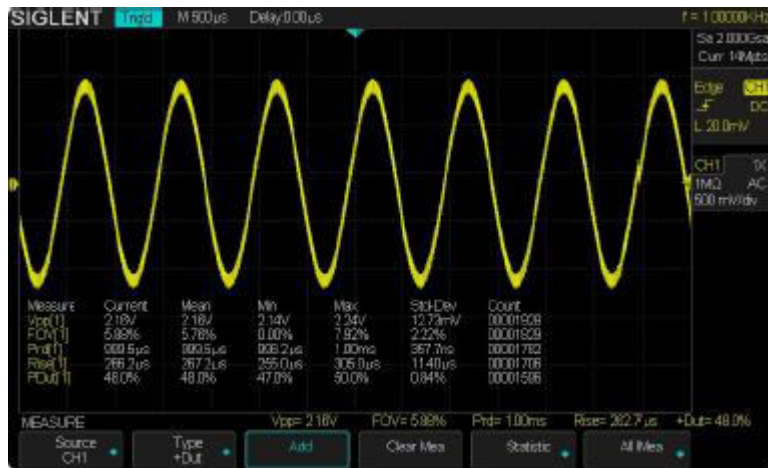
Runt trigger



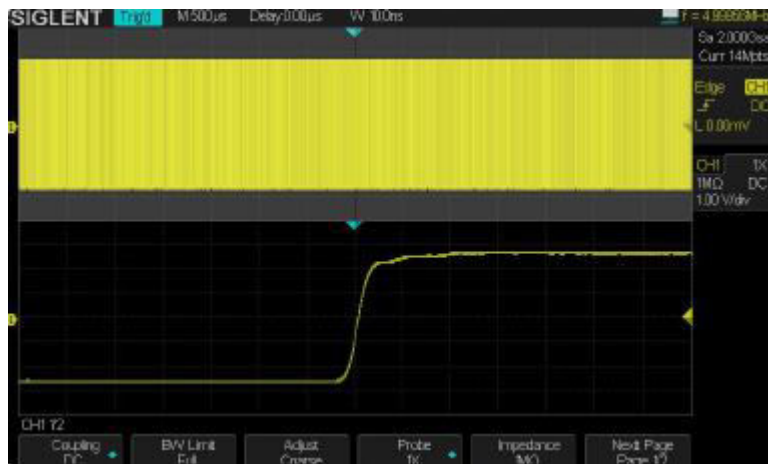
Interval trigger



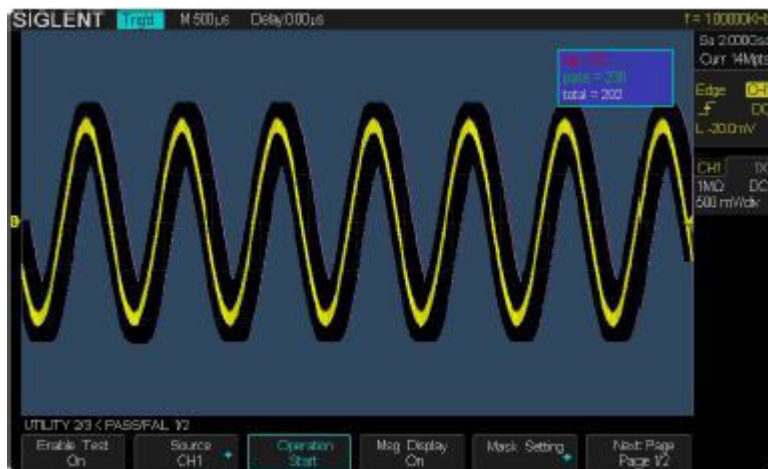
Automatic measurements with statistics



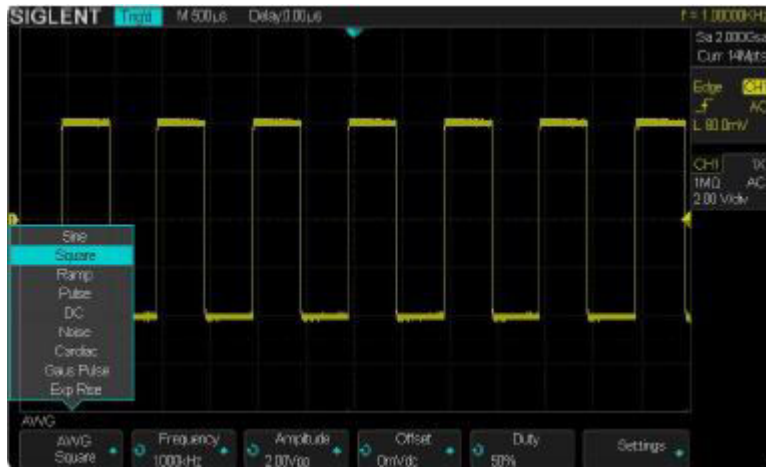
Zoom function based on hardware technology



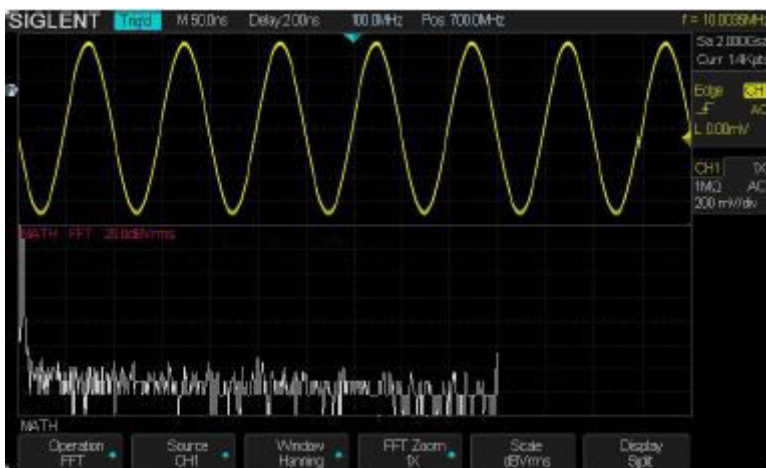
High speed P/F Test Function



Built-in Waveform Generator (Option)



Advanced Math Function



Various Connectivity (USB Host&Device, LAN, AUX)



Specifications

| Input | |
|-----------------------------------|--|
| Channels | 2/4 |
| Coupling | AC, DC, GND |
| Impedance | (1MΩ±2%) (20pF ±4pF) |
| | 50Ω: 50Ω±2% |
| Max.Input voltage | 400Vrms, CAT I, 10X, 1MΩ |
| CH to CH Isolation | >100:1 |
| Probe attenuator | 1X, 10X, 50X, 100X, 500X,1000X |
| Vertical System | |
| Bandwidth | 300MHz (SDS2304/ SDS2302) |
| | 200MHz (SDS2204/ SDS2202) |
| | 100MHz (SDS2104/ SDS2102) |
| | 70MHz (SDS2074/ SDS2072) |
| Vertical Resolution | 8 bit |
| Vertical Scale | 2 mV/div ~ 10 V/div |
| Offset Range | 2mV/div ~ 100mV/div: ± 1V |
| | 1.02mV/div ~ 1V/div: ± 10V |
| | 1.02V/div ~ 10V/div: ± 100V |
| Bandwidth Limit | 20MHz ±40% |
| Bandwidth Flatness | DC ~ 10% of BW: ± 1dB |
| | 10% ~ 50% of BW: ± 2dB |
| | 50% ~ 100% of BW: + 2dB/-3dB |
| Low Frequency Response (AC - 3dB) | ≤10Hz |
| Noise | ≤0.6 Div for average of 10 Pk-Pk readings, Fixed gain settings |
| | ≤ 1.0 Div for average of 10 Pk-Pk readings (152mV/div ~ 198mV/div,1.52V/div ~ 1.98V/div) |
| SFDR including harmonics | ≤0.7 Div for average of 10 Pk-Pk readings, variable gain settings |
| DC Gain Accuracy | ≥35dB(≥10mV/div); ≥30dB(<10mV/div) |
| | ≤±3.0%: 5mV/div ~10V/div |
| DC Measurement Accuracy | ≤±4.0%: 2mV/div |
| | ±[3%× (Reading + Offset) +1%× Offset +0.2div+2mV] , ≤100mV/div |
| Offset Accuracy | ±[3%× (Reading + Offset) +1%× Offset +0.2div+100mV] , > 100mV/div |
| | ± (1%*Offset+1%*8*div+2mV) |
| Risetime | <1.2ns (SDS2304/ SDS2302) |
| | <1.7ns (SDS2204/ SDS2202) |
| | <3.5ns (SDS2104/ SDS2102) |
| | <5.0ns (SDS2074/ SDS2072) |

| | |
|--------------|--------|
| Overshoot | <15% |
| Channel Skew | <200ps |

| | |
|----------------------|--|
| Math Function | |
| Operation | +, -, *, /, FFT, d/dt, ∫ dt, √ |
| FFT | Window: Rectangular, Blackman, Hanning, Hamming Sample points: 1024 |

| | |
|--------------------------|----------------------------------|
| Horizontal System | |
| Timebase Scale | 1.0ns/div ~ 50s/div |
| Waveform Capture | 110,000 wfm/s |
| Intensity grading | 256 Levels |
| Display Format | Y-T, Zoom, Roll, X-Y |
| Timebase Accuracy | ±25ppm |
| Roll mode | 100ms/div ~ 50s/div (1-2-5 step) |

| | |
|-----------------------|---|
| Trigger System | |
| Trigger Mode | Auto, Normal, Single |
| Trigger Level | Internal: ±4.5 div from the center of the screen |
| Range | EXT: ±1.2V ; EXT/5: ±6v |
| Holdoff Range | 100ns ~ 1.5s |
| Trigger Coupling | AC, DC, LF Rej, HF Rej DC: Passes all components of the signal AC: Blocks DC components and attenuates signals below 5.8Hz LF Rej: Blocks the DC component and attenuates the low-frequency components below 2.08MHz HF Rej: Attenuates the high-frequency components above 1.27MHz |
| Trigger Accuracy | ±0.2div |
| Trigger Sensitivity | Internal: 0.5 div EXT: 200mVpp DC ~ 10MHz 300mVpp 10MHz ~ BW EXT/5: 1Vpp DC ~ 10MHz 1.5Vpp 10MHz ~ BW |
| Trigger Jitter | <200ps : |
| Trigger Displacement | Pre-Trigger: 7 divisions Delay Trigger: 10s ~ 1,000,000,000s |

| | |
|---------------------|-------------------------------------|
| Edge Trigger | |
| Slope | Rising, Falling, Rising&Falling |
| Source | CH1/CH2/CH3/CH4/EXT/(EXT/5)/AC Line |

| | |
|----------------------|-----------------|
| Slope Trigger | |
| Slope | Rising, Falling |
| Limit Range | <, >, < >, > < |
| Source | CH1/CH2/CH3/CH4 |

| | |
|-------------------------|---|
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |
| Pulse Trigger | |
| Polarity | +wid , -wid |
| Limit Range | < , > , < > , > < |
| Source | CH1/CH2/CH3/CH4 |
| Pulse Range | 2ns ~ 4.2s |
| Resolution | 1ns |
| Video Trigger | |
| Signal Standard | NTSC, PAL/Secam,720p/50 , 720p/60,1080p/50, 1080p/60, 1080i/50, 1080i/60,Custom |
| Source | CH1/CH2/CH3/CH4 |
| Sync | ANY,Select |
| Window Trigger | |
| Window Type | Absolute,Relative |
| Source | CH1/CH2/CH3/CH4 |
| Interval Trigger | |
| Slope | Rising,Falling |
| Limit Range | < , > , < > , > < |
| Source | CH1/CH2/CH3/CH4 |
| Time Range | 2ns ~ 4.2s |
| Dropout Trigger | |
| Timeout Type | Edge, State |
| Source | CH1/CH2/CH3/CH4 |
| Slope | Rising,Falling |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |
| Runt Trigger | |
| Slope | +wid , -wid |
| Limit Range | < , > , < > , > < |
| Source | CH1/CH2/CH3/CH4 |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |
| Pattern Trigger | |
| Pattern Setting | Invalid, Low, High |
| Logic | AND, OR, NAND, NOR |
| Source | CH1/CH2/CH3/CH4 |
| Limit Range | < , > , < > , > < |
| Time Range | 2ns ~ 4.2s |
| Resolution | 1ns |
| Serial Trigger | |
| I2C Trigger | |
| Condition | Start, Stop, Restart, No Ack, EEPROM, 7bits Address&Data, |

| 10bits Address&Data, Data Length | |
|----------------------------------|---|
| SPI Trigger | |
| Trigger Source | MOSI, MISO |
| Data Length | 4 ~ 96 bits |
| Value | 0, 1, X |
| Bit Order | LSB, MSB |
| UART/ RS232 Trigger | |
| Trigger Setting | Trigger Source RX, TX Condition Start, Stop, Data, Check Error |
| Bus Configure | Baud 600/1200/2400/4800/9600/19200/38400/ 57600/115200/Custom |
| | Data Length 5bits, 6bits, 7bits, 8bits |
| | Parity Check No, odd, even |
| | Stop Bit 1, 1.5, 2 |
| | Idle Level Low, High |
| CAN Trigger | |
| Trigger Setting | Condition Start, Remote Frame, Data Frame, ID&DATA |
| Bus Configure | Baud 5kb/s, 10kb/s, 20kb/s, 50kb/s, 100kb/s, 125kb/s, 250kb/s, 500kb/s, 800kb/s, 1Mb/s, Custom |
| LIN Trigger | |
| Trigger Setting | Condition Start, ID, ID&DATA, Error |
| Bus Configure | Baud 600/1200/2400/4800/9600/19200/Custom |
| Serial Decode | |
| I2C | |
| Signal | SCL, SDA |
| Address | 7bits, 10bits |
| List | 1 ~ 7 lines |
| SPI | |
| Signal | CLK, MISO, MOSI, CS |
| Edge Select | Rising, Falling |
| Idle Level | Low, High |
| Bit Order | MSB, LSB |
| Data Length | 4 ~ 96 bits |
| List | 1 ~ 7 lines |
| UART/RS232 | |
| Signal | RX, TX |
| Configure | Baud 600/1200/2400/4800/9600/19200/38400/ 57600/115200/Custom |
| | Parity Check No, odd, even |
| | Stop Bit 1, 1.5, 2 |
| | Idle Level Low, High |
| | Data Length 5bits, 6bits, 7bits, 8bits |
| List | 1 ~ 7 lines |

| CAN | |
|--------------------------------|---|
| Signal | CAN_H, CAN_L |
| Configure | Baud 5kb/s, 10kb/s, 20kb/s, 50kb/s, 100kb/s, 125kb/s, 250kb/s, 500kb/s, 800kb/s, 1Mb/s, Custom |
| Decode Source List | CAN_H, CAN_L, CAN_H – CAN_L 1 ~ 7 lines |
| LIN | |
| Configure | Baud 600/1200/2400/4800/9600/19200/Custom |
| List | 1 ~ 7 lines |
| Measure System | |
| Auto Measurement (32 Types) | Vpp, Vmax, Vmin, Vamp, Vtop, Vbase, Vavg, Mean, Crms Vrms, ROV, FOV, RPRE, FPRE, Rise time, Fall time, Freq Period, + Wid, - Wid, + Dut, - Dut, BWid, Phase, FRR FRF, FFR, FFF, LRR, LRF, LFR, LFF |
| Cursor | Time (X1, X2), (X1X2) Voltage (Y1, Y2), (Y1Y2) |
| Statistics | Current, Mean, Min, Max, Std-Dev, Count |
| Sample System | |
| Sample Mode | Real Time sample |
| Sample Rate | 2GSa/s |
| Memory Depth | Max.14Mpts, available |
| Acquisition | Sample, Peak Detect, Average, High Res |
| Averages | 4, 16, 32, 64, 128, 256, 512, 1024 |
| Waveform Generator | |
| Channels | 1 |
| Max. Frequency | 25MHz |
| Sample Rate | 125 MSa/s |
| Arb waveform length | 16 kpts |
| Frequency Resolution | 1 μ Hz |
| Vertical Resolution | 14 bits |
| Amplitude Range | 2 mVpp ~ 3 Vpp (50 Ω) 4 mVpp ~ 6 Vpp (High-z) |
| Sine Wave | |
| Frequency | 1 μ Hz ~ 25MHz |
| Offset Accuracy (100 kHz) | \pm (0.3dB of Setting Value + 1mVpp) |
| Amplitude flat (100 kHz, 5Vpp) | \pm 0.3 dB |
| SFDR | DC ~ 1 MHz -60dBc 1 MHz ~ 5 MHz -53dBc 5 MHz ~ 25 MHz -35dBc |

| | |
|--------------------------|---|
| Square/Pulse Wave | |
| Frequency | 1 μ Hz ~ 10MHz |
| Duty Cycle | 20% ~ 80% |
| Rise/Fall time | < 24 ns (10% ~ 90%) |
| Overshoot | < 5%(1kHz, 1Vpp, Typeical) |
| Pulse Width | 48ns~1ms |
| Jitter | 8ns |
| Ramp Wave | |
| Frequency | 1 μ Hz ~ 300kHz |
| Linearity | < 0.1% of Pk-Pk value |
| Symmetry | 0% ~ 100% |
| DC Offset | |
| Range | ± 1.5 V (50 Ω) |
| | ± 3.0 V (High) |
| Offset Accuracy | \pm (setting value *1%+3 mV) |
| Noise | |
| Bandwidth | >20MHz (-3dB) |
| Cardiac | |
| Frequency | 1 μ Hz ~ 5MHz |
| Gaus Pulse | |
| Frequency | 1 μ Hz ~ 5MHz |
| Exp Rise | |
| Frequency | 1 μ Hz ~ 5MHz |
| Exp Fall | |
| Frequency | 1 μ Hz ~ 5MHz |
| I/O | |
| Standard Ports | USB Host, USB Device, LAN, Pass/Fail, Trigger Out |
| Pass/Fail | 3.3V TTL Output |

General Specifications

Display

| | |
|---------------|---|
| Display Type | 8.0 inches TFT LCD |
| Resolution | 800 (Horizontal) × 480 (Vertical) pixel |
| Color | 24 bit |
| Contrast | 500:1 |
| Backlight | 300nit |
| Range | 8 x 14 div |
| Display Mode | Dot, Vector |
| Persist | Off, 1 sec, 5 sec, 10 sec, 30 sec, Infinite |
| Color Display | Normal, Color |
| Screen Saver | 1min, 5min, 10min, 30min, 1h, Offset |
| Language | Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Spanish, Russian, Italian, Portuguese |

Environments

| | |
|-------------------------------|---|
| Temperature | Operating: 10°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: ≤3000m |
| | Non-Operating: ≤15,266m |
| Electromagnetic Compatibility | 2004/108/EC Directive |
| | Applicable standards EN 61326-1:2006 |
| | EN 61000-3-2:2006 + A2:2009 EN 61000-3-3:2008 |
| Safety | 2006/95/EC Low Voltage Directive EN 61010-1:2010/EN 61010-2-030:2010 |

Power Supply

| | |
|---------------|---------------------------------------|
| Input Voltage | 100 ~ 240 VAC, CAT II, Auto selection |
| Frequency | 50/60 Hz |
| Power | 80W Max |

Mechanical

| | |
|------------|---------------------------------|
| Dimensions | Length 352mm |
| | Width 112mm |
| | Height 224mm |
| Weight | N.W. Two channels model: 3.4 kg |
| | Four channels model: 3.6 kg |
| | G.W. Two channels model: 4.9 kg |
| | Four channels model: 5.2 kg |

Ordering information

| | Description |
|----------------------|--|
| Model | SDS2304(300MHz, 4 Channels) |
| | SDS2204(200MHz, 4 Channels) |
| | SDS2104(100MHz, 4 Channels) |
| | SDS2074(70MHz, 4 Channels) |
| | SDS2302(300MHz, 2 Channels) |
| | SDS2202(200MHz, 2 Channels) |
| | SDS2102(100MHz, 2 Channels) |
| | SDS2072(70MHz, 2 Channels) |
| Standard Accessories | A Quick Start |
| | Two pieces 1:1/(10:1) Passive Probe |
| | A Certification |
| | An CD(including EasyScopeX computer software system) |
| | A Power Cord that fits the standard of destination country |
| Optional Accessories | A USB Cable |
| | AWG Function (SDS-2000-FG) |
| | Decode Function (SDS-2000-DC) |
| | MSO Function (SDS-2000-8LA) |
| | Power Analyse Software |