SHS800X
SHS1000X
Handheld Digital Oscilloscope

Data Sheet

EN01E



SIGLENT TECHNOLOGIES CO., LTD.

SHS820X/SHS1202X
SHS810X/SHS1102X

Product Overview

SIGLENT's Handheld Digital Oscilloscopes include the SHS800X and SHS1000X models. Both feature 2 analog oscilloscope input channels and are available in 200 MHz and 100 MHz analog bandwidths, a single ADC with 1 GSa/s maximum sample rate, and a single memory module with 12 Mpts memory depth. When two channels are enabled, each channel has sample rate of 500 MSa/s and a standard record length of 6 Mpts. When only a single channel is actived, the maximum sample rate is 1 GSa/s and the maximum record length is 12 Mpts. For ease-of-use, the most commonly used functions can be accessed with its user-friendly front panel design.

The SHS800X series has two non-isolated scope channels and one isolated multimeter channel.

The SHS1000X series features full isolation between the two oscilloscope channels, one multimeter channel, power adapter and the USB host/device port. The full isolation makes it ideal for both laboratory and floating signal measurement because it reduces the risk of accidental short circuits.

The max voltage input to the analog scope inputs is CATIII 600 Vrms, CATII 1000 Vrms. And the max input for the multimeter is CATIII 600 Vrms, CATII 1000 Vrms.

The SHS series utilizes a new generation of SPO (Super-Phosphor Oscilloscope) technology that provides excellent signal fidelity and performance. It comes with a vertical input range from 2 mV/div to 100 V/div, and a max offset range up-to to 400 V.

The innovative digital trigger system delivers high sensitivity and low jitter, and a waveform capture rate of up-to 400,000 frames/sec. The SHS also employs a 256-level intensity grading display function and a color temperature display mode for clarity and fast fault identification.

The SHS' have multiple powerful triggering modes including serial bus triggering as well as free decoding for IIC, SPI, UART, CAN, LIN bus types. The SHS models also include History waveform recording, and sequential triggering that enable extended waveform recording and analysis. Another powerful addition is the new 1 million point FFT math function that gives the SHS 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 SHS series feature built-in sample and measurement value recorders. The sample recorder can achieve a maximum sampling rate of 25 kSa/s, and can record for up to 22 hours at this sampling rate. The measurement value recorder can simultaneously record 4 sets of measurement values at a recording interval as low as 0.1 s which delivers up-to 25 hours of continuous recording.

The SHS series integrates a 6000 count digital multimeter, isolated from the scope that can measure DC/AC Voltage, DC/AC Current, Resistance, Capacitance, Diodes, and Continuity.

A rechargeable 6900 mAh lithium battery supports up-to 5.5 hours (4 hours SHS1000X) of work without a charge.

The handheld oscilloscopes feature a sealed IP51 dust and drip-proof housing and has been tested to IEC60529 to guarantee the ruggedness that is needed to survive harsh environments. A rubberized surface with large keys also makes it easy to use in difficult environments.

Key Features

- 200 MHz, 100 MHz bandwidth models
- Sample rate of 1 GSa/s (single-channel), Sample rate of 500 MSa/s (two-channels)
- The Siglent SPO technology
- Waveform capture rates up to 100,000 wfm/s (normal mode) and 400,000 wfm/s (sequence mode)
- Supports 256-level intensity grading and color temperature display modes
- Record length up to 12 Mpts
- Digital trigger system
- Intelligent trigger: Edge, Slope, Pulse Width, Window, Runt, Interval, Time out (Dropout), Pattern
- Serial bus triggering and decoding (Standard) for IIC, SPI, UART, CAN, and LIN protocols
- Video trigger/HDTV
- Low background noise with voltage scales from 2 mV/div to 100 V/div
- 3 one-button shortcuts for Oscilloscope, Multimeter and Recorder functions
- 8 one-button shortcuts for: Run/Stop, Auto Setup, Default, Measure, Cursors, Display/Persist, Clear Sweep and Print. More function shortcuts available when combined with the shift button
- 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. Support Peaks and Markers
- Math and measurement functions use all sampled data points (up to 12 Mpts)
- Math functions (FFT, addition, subtraction, multiplication, division, integration, differential, square root)
- Default key can be customized for user settings or factory "defaults"
- Supports Multi-language display and embedded online help
- Security Erase mode
- Search and navigate function
- Includes Recorder mode, including Sample and Measurement Loggers
- 6000 counts Digital Multimeter, Support DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity test
- True RMS AC Voltage/Current measurement multimeter
- 5.6-inch TFT-LCD display with 640*480 resolution
- Interface types: Isolated USB Host, USB Device (MicroUSB-TMC)
- Supports SCPI remote control commands
- UL2054 certified lithium battery pack, 6900 mAh capacity, external charger
- IP Rating: IP51
- Compliance with UL61010-1, UL61010-2-030, UL61010-2-033

Models and Key Specifications

Model	SHS810X	SHS820X	SHS1102X	SHS1202X
Bandwidth	100 MHz	200 MHz	100 MHz	200 MHz
Sample Rate (Max.)	Two-channel share a single 1 GSa/s ADC. When two channels are enabled, each channel has a maximum sample rate of 500 MSa/s. When a single channel is active, that channel has a sample rate of 1 GSa/s			
Channels	2 analog oscilloscope channels, 1 multimeter channel			
Memory Depth (Max.)	6 Mpts/CH (dual-channel mode) 12 Mpts/CH (single channel mode)			
Waveform Capture Rate (Max.)	100,000 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	I^2C, SPI, UART, CAN, LIN			
Data Logger (Recorder)	Sample Logger. The Max sample rate is 25 kSa/s, the Min sample rate is 1 Sa/s			
	Measurement Logger. The Max interval is 10 minutes, the Min interval is 0.1 second. The Max items of logging is 4			
I/O	USB Host, USB Device			
Max Input Voltage (Scope)	CAT II 300 Vrms Between BNC Signal and Protecting Earth CAT II 30 Vrms Between BNC GND and Protecting Earth CAT II 300 Vrms Between BNC Signal and BNC GND		CAT III 600 Vrms, CAT II 1000 Vrms Between BNC Signal and Protecting Earth CAT III 600 Vrms, CAT II 1000 Vrms Between BNC GND and Protecting Earth CAT III 300 Vrms Between BNC Signal and BNC GND	
Max Input Voltage (Meter)	CAT III 300 Vrms, CAT II 600 Vrms		CAT III 600 Vrms, CAT II 1000 Vrms	
Probe	PP510	PP215	PB925	
Display	5.6-inch TFT-LCD (640*480)			
Weight	Without package 1.75 kg. With package 3.5 kg			

Functions & Characteristics

Front panel and back panel



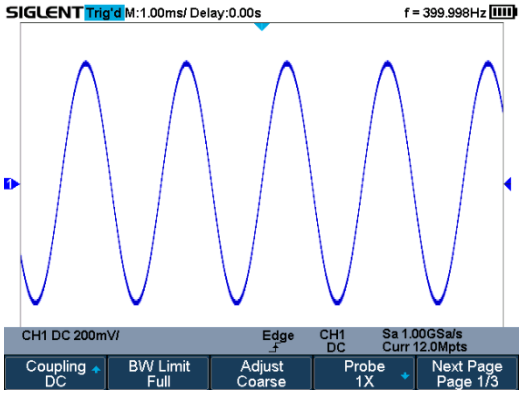
Front panel of the SHS800X series

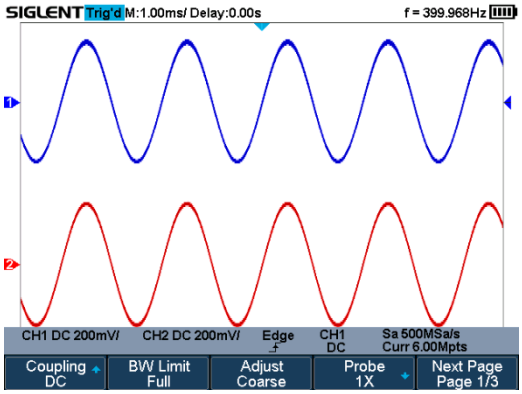


Rear of the SHS800X series

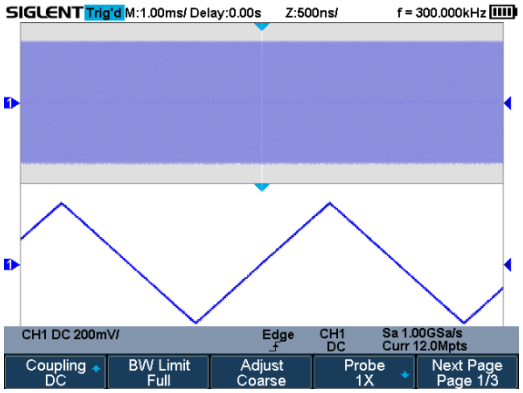
Large bright 5.6-inch TFT -LCD display with 640*480 resolution. The most commonly used functions are accessible using 8 different one-button operation keys: Run/Stop, Auto Setup, Default, Cursor, Measure, Display/Persist, Clear Sweep, and Print. More function shortcuts are available combined with the shift button.

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



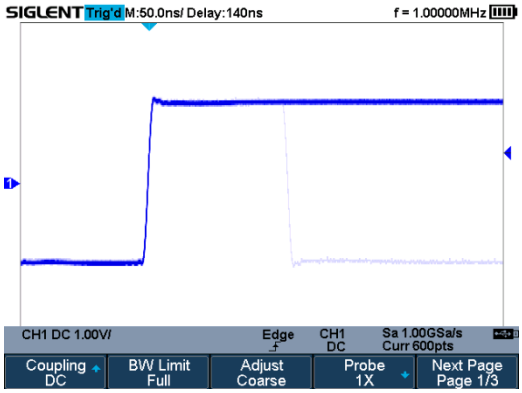


Record Length of up to 12 Mpts



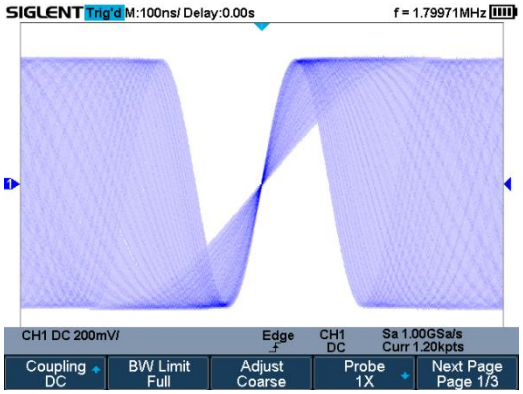
Using hardware-based Zoom technologies and max record length up to 12 Mpts, users can oversample to capture for longer periods at higher resolution and use the zoom feature to see more details within each signal.

Waveform Capture Rate up to 400,000 wfm/s

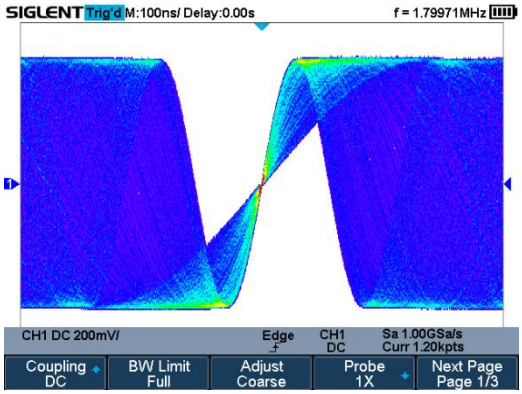


With a waveform capture rate of up to 400,000 wfm/s (sequence mode), the oscilloscope can easily capture unusual or low-probability events.

256-Level Intensity Grading and Color Temperature Display

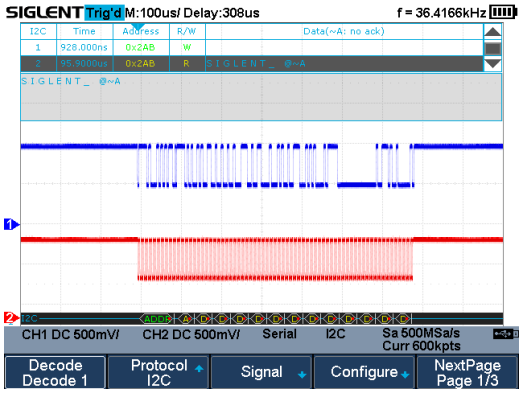


SPO display technology provides fast refresh rates. The resulting intensity-graded trace is brighter for events that occur with more frequency and dims when the events occur with less frequency.



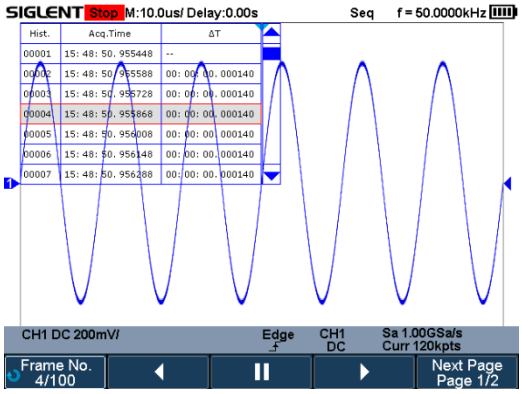
The color temperature display is similar to the intensity-graded trace function, but the trace occurrence is represented by different colors (color “temperature”) as opposed to changes in the intensity of one color. Red colors represent events that occur more frequently, while blue is used to mark points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

Serial Bus Decoding Function



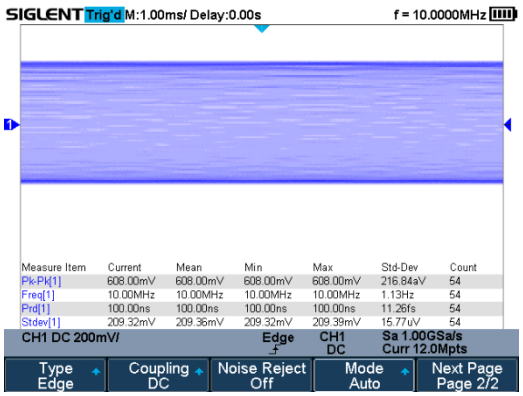
SHS800X/SHS1000X displays the decoding through the events list. Bus protocol information can be quickly and intuitively displayed in a tabular format.

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



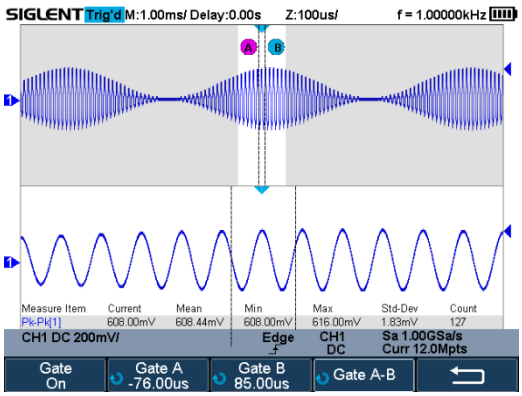
Playback the latest triggered events using the history function. Segmented memory collection will store trigger events into multiple (Up to 80,000) memory segments, each segment will store triggered waveforms and timestamps for each frame.

True Measurement to 12M points



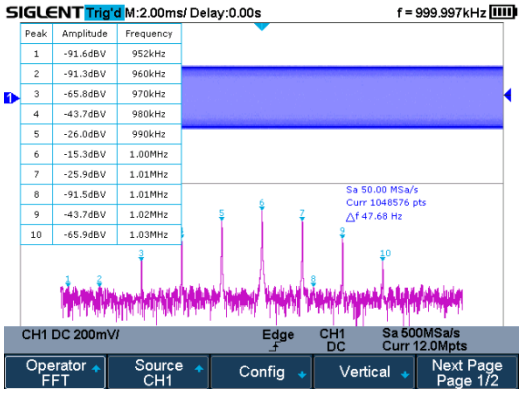
SHS800X/SHS1000X series can measure all sampled data points up to 12 Mpts. This ensures the accuracy of measurements while the math co-processor decreases measurement time and increases ease-of-use.

Gate and Zoom Measurement



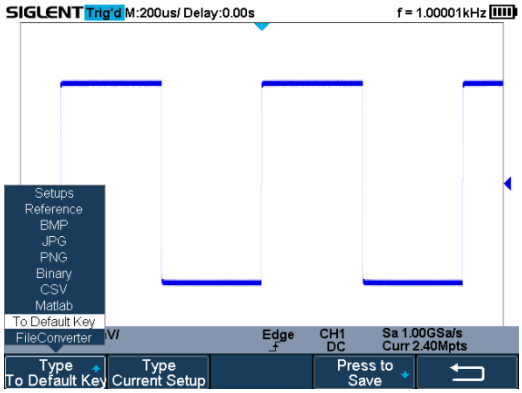
Through Gate and Zoom measurement, the user can specify an arbitrary interval of waveform data analysis and statistics. This helps avoid measurement errors that can be caused by invalid or extraneous data, greatly enhancing the measurements' validity and flexibility.

1M points used to calculate the FFT



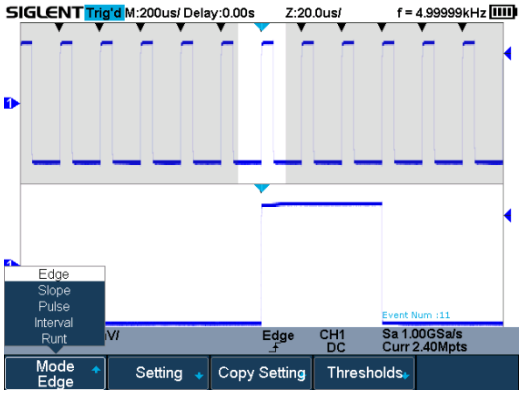
The new math co-processor enables FFT analysis of incoming signals using up to 1M samples per waveform. This provides high-frequency resolution with a fast refresh rate. The FFT function also supports a variety of window functions so that it can adapt to different spectrum measurement needs. Support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

Customizable Default Key



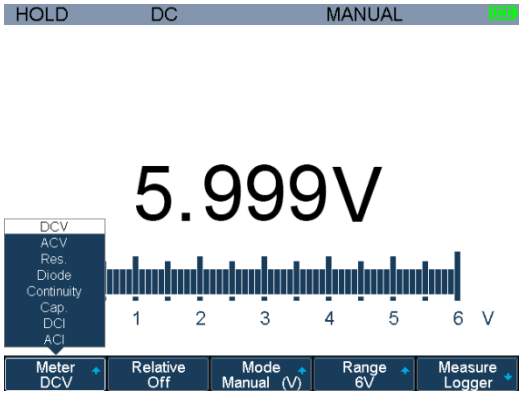
The current parameters of the oscilloscope can be preset to Default Key through the Save menu.

Search and Navigate



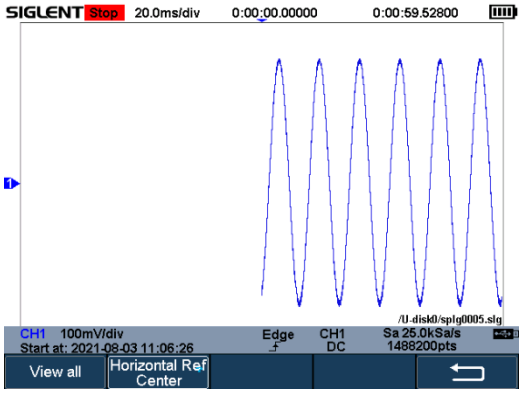
The SHS800X/SHS1000X series can search events specified by the user in a frame. It can also navigate by time (delay position) and historical frames.

6000 Counts Digital Multimeter



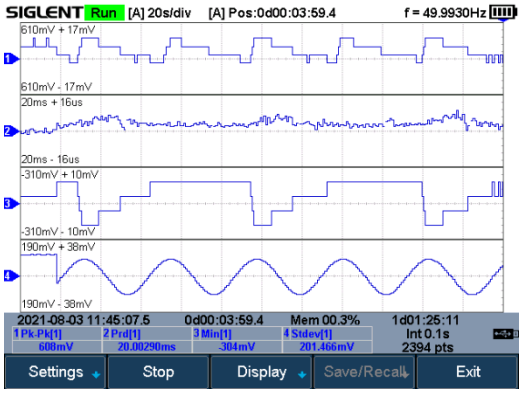
6000 counts digital multimeter featured function of DCV, true RMS ACV, DCI, ACI, Diode, Resistance, Capacitance, and Continuity.

Sample Logger



The Sample Logger is the mode of logging the sampling points for a long time. For there are many sampling points to log, they are logged into the internal flash or external U disk in real-time. After stopping logging, the user can recall the sampling points on the oscilloscope, or analyze the saved data on the computer.

Measurement Logger



The measurement Logger is the mode of logging the measurement value for a long time. For the amount of measurement data is relatively small, to process quickly, the data is logged in memory. After stopping logging, the data can be saved into the internal flash or external U disk.

Adapter/Battery



Wall power using the supplied adapter



Battery powered

SHS800X/SHS1000X supports adapter power supply and battery power supply. After connecting the adapter, the battery enters into charging mode. The adapter provides a maximum 4 A output current.

SHS800X/SHS1000X uses a UL2054 certified lithium battery package. The battery capacity of 6900 mAh can guarantee long-term operation without an external power supply for up-to 5.5 hours (SHS800X) and 4 hours (SHS1000X). The battery supports an external charger to further meet the requirements of portability.

Connectivity



Right side of the SHS800X series



Left side of the SHS800X series

SHS800X/SHS1000X supports USB Host, USB Device (Micro USB-TMC).

Specifications

Oscilloscope		
Acquisition System		
Model	**SHS800X**	**SHS1000X**
Sampling Rate (Max.)	1 GSa/s (single channel), 500 MSa/s (two channels)	
Memory Depth (Max.)	Max 12 Mpts/Ch (single channel), 6 Mpts/Ch (two channels)	
Peak Detect	2 ns	
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		
Model	**SHS800X**	**SHS1000X**
Channels	2 channels	
Coupling	DC, AC, GND	
Impedance	DC: (1 MΩ ±2%) ‖ (14 pF ±2 pF)	DC: (1 MΩ ±2%) ‖ (14 pF ±2 pF)
Max. Input Voltage [1]	CAT II 300 Vrms between BNC Signal and Protecting Earth CAT II 30 Vrms between BNC GND and Protecting Earth CAT II 300 Vrms between BNC Signal and BNC GND	CAT III 600 Vrms, CAT II 1000 Vrms between BNC Signal and Protecting Earth CAT III 600 Vrms, CAT II 1000 Vrms between BNC GND and Protecting Earth CAT III 300 Vrms between BNC Signal and BNC GND
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	

Note:

[1] According to IEC61010-1, a voltage higher than 30 Vrms is a dangerous voltage, necessary protection must be taken to prevent personal injury. Please read the user's manual for details.

Vertical System		
Model	**SHS800X**	**SHS1000X**
Bandwidth (-3 dB) [2]	≥200 MHz (SHS820X) ≥100 MHz (SHS810X)	≥200 MHz (SHS1202X) ≥100 MHz (SHS1102X)
Vertical Resolution	8-bit	
Vertical Scale (Probe 1X)	2 mV/div ~ 100 V/div (1-2-5 sequence)	5 mV/div ~ 100 V/div (1-2-5 sequence)
Offset Range	2 mV ~ 296 mV: ±5 V	

(Probe 1X)	302 mV ~ 7.5 V: ±80 V 7.6 V ~ 100 V: ±400 V	
Bandwidth Limit [2]	20 MHz ±40%	
Bandwidth Flatness [2]	DC ~ 10% (BW): ±1 dB 10% ~ 50% (BW): ±2 dB 50% ~ 100% (BW): +2 dB/-3 dB	
Low-frequency Response (AC coupling -3 dB)	≤2 Hz (at input BNC)	
Noise/SNR	2 mV/div: >24 dB 5 mV/div: >25 dB ≥10 mV/div: >35 dB P-P Noise ≤15 SDEV Spec	
SFDR Including Harmonics	≥30 dB	≥28 dB
CMRR		>100 dB DC >50 dB to AC 1 MHz
DC Gain Accuracy	≤±3%: ≥10 mV/div ≤±4%: <10 mV/div	
Offset Accuracy	±(1.5%*Offset + 1.5%*8*div + 5 mV)	±(1.5%*Offset + 1.5%*8*div + 5 mV)
Rise Time [2]	Typical 1.7 ns (SHS820X) Typical 3.5 ns (SHS810X)	Typical 2.0 ns (SHS1202X) Typical 3.5 ns (SHS1102X)
Overshoot (500 ps Pulse) [2]	typical 12%	typical 18%

Note:

[2] The SHS series handheld oscilloscope featured 1 MΩ input impedance. Bandwidth and pulse response must be verified with an external 50 Ω adapter, to guarantee signal integrity at higher frequency.

Horizontal System	
Timebase Scale	1.0 ns/div ~ 100 s/div
Channel Skew	<300 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	
Mode	Auto, Normal, Single
Level	Internal: ±4.5 div from the center of the screen
Hold off Range	80 ns ~ 1.5 s
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
Accuracy (typical)	Internal: ±0.2 div
Sensitivity	DC ~ Max BW: 0.8 div
Jitter	<100 ps
Displacement	Pre-Trigger: 0 ~ 100% Memory Delay Trigger: 0 to 10,000 div
Edge Trigger	
Slope	Rising, Falling, Rising & Falling
Source	All channels
Slope Trigger	
Slope	Rising, Falling
Limit Range	<, >, <>, ><
Source	All channels
Time Range	2 ns ~ 4.2 s
Resolution	1 ns
Pulse Width 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	
I^2C 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, Space, Mark
Stop Bit	1, 1.5, 2-bits
Idle Level	High, Low
Baud Rate (Selectable)	600/1200/2400/4800/960019200/38400/57600/115200/Custom bit/s
Baud Rate (Custom)	300 ~ 5000000 bit/s
CAN Trigger	
Condition	Start, Remote, ID, ID+Data, Error
Source	All channels
ID	STD (11-bits), EXT (29-bit)
Data Format	Hex
Data Length	1 ~ 2 byte
Baud Rate	5k/10k/20k/50k/100k/125k/250k/500k/800k/1M/Custom 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/Custom bit/s
Baud Rate (Custom)	300 bit/s ~ 20 Mbit/s

Search	
Event	Edge, Slope, Pulse, Interval, Runt
Event Number	Y-T: 600 ROLL: No limitation Stop After ROLL: 600

Serial Decoder	
Decoders	2
I^2C	
Signal	SCL, SDA
Address	7, 10 bits
Threshold	-4.5 ~ 4.5 div
List	1 ~ 7 lines
SPI	
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	
Signal	RX, TX
Data Width	5, 6, 7, 8 bits
Parity Check	None, Odd, Even, Space, Mark
Stop Bit	1, 1.5, 2 bits
Idle Level	Low, High
Threshold	-4.5 ~ 4.5 div
List	1 ~ 7 lines
CAN	

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	
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 are displayed in the statistics table	
Measurement Range	Screen or Gate region	
Measurement Parameters	38 types	
Vertical	Max	Highest value in input waveform
	Min	The lowest value of the 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 unimodal 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	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
	+Duty	Time difference between the 50% threshold of a rising edge to the 50% threshold of the next falling edge of the pulse
	-Duty	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 Mean, Min, Max, Standard Deviation of time from the trigger to each rising edge at the 50% crossing in multiple frames (number = Count). The Current shows the time of the current frame from the trigger to the last rising edge at the 50% crossing.
Delay	Phase	Phase difference between two edges
	FRFR	Time from the first rising edge of channel A to the following first rising edge of channel B
	FRFF	Time from the first rising edge of channel A to the following first falling edge of channel B
	FFFR	Time from the first falling edge of channel A to the following first rising edge of channel B
	FFFF	Time from the first falling edge of channel A to the following first falling edge of channel B
	FRLR	Time from the first rising edge of channel A to the last rising edge of channel B
	FRLF	Time from the first rising edge of channel A to the last falling edge of channel B
	FFLR	Time from the first falling edge of channel A to the last rising edge of channel B
	FFLF	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
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-digit counter (channels are selectable)	

Math	
Operation	+, −, *, / , FFT, d/dt, ∫dt, √
FFT Window	Rectangular, Blackman, Hanning, Hamming, Flattop
FFT Display →	Full Screen, Split, Exclusive

Recorder	
Sample Logger	
Source	CH1, CH2, CH1 & CH2
Sample Rate	1 Sa/s ~ 25 kSa/s (1-2-5 sequence)
Memory Depth	Internal memory 50 MB, Support External memory to 2 GB
Log Time with Max Sample Rate	Approx. 23 mins in single-channel mode, 11 mins in two channels mode with internal memory Approx. 22 hours in single-channel mode, 11 hours in two-channel mode with external memory
Data Format	Binary
Measurement Logger	
Source	Measurement, Meter, Measurement & Meter
Log Interval	0.1 s ~ 10 min
Number of Simultaneous Logging Channels	4
Memory Depth	Approx. 3.6M samples in single-channel mode, 900k samples in four-channel mode
Log Time with Minimum Interval	Approx. 100 hours
Data Format	Binary
Export Data Format	Binary, csv, MATLAB

Multimeter (DMM) [1]			
Maximum Resolution	6000 Counts		
Maximum Input Voltage (SHS800X)	CAT III 300 Vrms CAT II 600 Vrms		
Maximum Input Voltage (SHS1000X)	CAT III 600 Vrms CAT II 1000 Vrms		
Maximum Input Voltage (For adapter SCD10A, SCD600MA)	CAT III 60 Vrms		
Function	**Range**	**Resolution**	**Accuracy [4]**
DC Voltage	60.00 mV	10 µV	(±1% ±15 digit)
	600.0 mV	100 µV	(±1% ±5 digit)

	6.000 V	1 mV	
	60.00 V	10 mV	
	600.0 V	100 mV	
	1000 V [3]	1 V	(±1.5% ±5 digit)
AC Voltage (45 Hz ~ 400 Hz)	60.00 mV	10 µV	(±1% ±15 digit)
	600.0 mV	100 µV	(±1% ±5 digit)
	6.000 V	1 mV	
	60.00 V	10 mV	
	600.0 V	100 mV	
	750 V [3]	1 V	(±1.5% ±5 digit)
DC Current [2] [5]	60.00 mA	10 µA	(±4% ±10 digit)
	600.0 mA	100 µA	
	6.000 A	1 mA	(±5% ±5 digit)
	10.00 A	10 mA	
AC Current [2] [5] (45 Hz ~ 400 Hz)	60.00 mA	10 µA	(±4% ±10 digit)
	600.0 mA	100 µA	
	6.000 A	1 mA	(±5% ±5 digit)
	10.00 A	10 mA	
Resistance	600.0 Ω	0.1 Ω	(±1% ±5 digit)
	6.000 kΩ	1 Ω	
	60.00 kΩ	10 Ω	
	600.0 kΩ	100 Ω	
	6.000 MΩ	1 kΩ	
	60.00 MΩ	10 kΩ	(±4% ±5 digit)
Capacitance	40.00 nF	0.01 nF	(±5% ±50 digit)
	400.0 nF	0.1 nF	(±5% ±5 digit)
	4.000 µF	1 nF	
	40.00 µF	10 nF	
	400.0 µF	100 nF	
Diode	0 ~ 2 V		
Continuity	Continuous beep when resistance <50 Ω		

Notes:

[1] The spec for DMM functions are calibrated and verified in Battery-Power mode, Temperature range [23 ℃ ±5 ℃], warm-up for 0.5 hour.

[2] For rank A (ampere) range, the measurement time should be less than 10 s, the interval time should be more than 15

minutes.

[3] This spec is for SHS1000X only, The maximum input voltage is 600 V (DC/AC) for the SHS800X series.

[4] ± of reading % ± range error. For AC signals, the input signal should be greater than 10% of range.

[5] 60 mA, 600 mA specification along with adapter SCD600MA; 6 A, 10 A specification along with adapter SCD10A.

I/O	
USB Host	1 port, isolated type A plug, Full/Low speed, memory sticks only
USB Device	1 port, Micro USB-B, remote control only
Probe Compensation Output	1 kHz, 0 ~ 5 V Square wave output

Display (Screen)	
Display Type	5.6-inch TFT LCD
Display Resolution	640×480 pixels
Display Color	24-bit
Contrast (Typical)	500:1
Backlight	200 nits

Display (Waveform)	
Range	8x12 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
Language	Simplified Chinese, Traditional Chinese, English, French, Japanese, Korean, German, Spain, Russian, Italian, Portuguese

Environmental	
Temperature	Operating: 0 ℃ ~ +40 ℃ Non-operating: -20 ℃ ~ +60 ℃
Humidity	Operating: 85% RH, 40 ℃, 24 hours Non-operating: 85% RH, 65 ℃, 24 hours
Height	Operating: ≤2000 m Non-operating: ≤5000 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, 150 kHz ~ 30 MHz
	Radiated disturbance	CISPR 11/EN 55011	CLASS A group 1, 30 MHz ~ 1 GHz
	Electrostatic discharge (ESD)	IEC 61000-4-2/EN 61000-4-2	4.0 kV (Contact), 8.0 kV (Air)
	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 2.7 GHz)
	Electrical fast transients (EFT)	IEC 61000-4-4/EN 61000-4-4	2 kV (Input AC Power Ports)
	Surges	IEC 61000-4-5/EN 61000-4-5	1 kV (Line to line)
	Radio-frequency continuous conducted Immunity	IEC 61000-4-6/EN 61000-4-6	3 V, 0.15 ~ 80 MHz
	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
Safety	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. UL 61010-2-033:2020.		

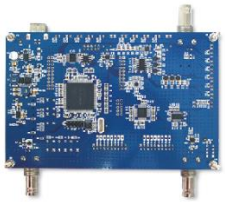
Power Supply / Battery		
Model	**SHS800X**	**SHS1000X**
Power Adapter		
Input	100 ~ 240 Vrms 50/60 Hz, 1.1 A	100 ~ 240 Vrms 50/60 Hz, 1.1 A
Output	12 V, 3 A	12 V, 4 A
Battery		
Operating Time	5.5 hours	4 hours
Charging Time	4 hours while the instrument is switched off	4 hours while the instrument is switched off
Capacity	6900 mAh	
Charging Protection	≥55 ℃ at battery	
Power Consumption		
Battery Mode	9 W	11 W

Mechanical	
IP Rating	IP51
Dimensions	Length: 276 mm Width: 168 mm Height (depth): 68 mm
Weight with Battery	Without package 1.75 kg. With package 3.5 kg

Probes and Accessories

Probe	Picture	Model	Specifications & Description
Passive		PP510	Bandwidth: 100 MHz, Attenuation Ratio: 1X/10X, Input Impedance: 1 MΩ/10 MΩ, Input Voltage: 1X CATII 150 V, 10X CATII 300 V
		PP215	Bandwidth: 200 MHz, Attenuation Ratio: 1X/10X, Input Impedance: 1 MΩ/10 MΩ, Input Voltage: 1X CATII 150 V, 10X CATII 300 V
High Voltage Passive		PB925	Bandwidth: 250 MHz, Attenuation Ratio: 10X Fixed, Input Impedance: 10 MΩ, Input Voltage: CATIII 600 V, CATII 1000 V
Multimeter Test Leads		SHS-MTL	Wire Length: 1 m, Rated Voltage: CATII 1000 V
Current Probes		CP4020	Bandwidth: 200 kHz, Max. Continuous Current: 21 Arms, Peak-peak Current: 60 A, Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: ±2%, Power Supply: 9 V adapter
		CP4050	Bandwidth: 1 MHz, Max. Continuous Current: 50 Arms, Peak-peak Current: 140 A, Switch Ratio: 500 mV/A, 50 mV/A, Accuracy: 500 mV/A (20 mA ~ 14 A (peak)) ±3%, 50 mV/A (200 mA ~ 50 A (peak)) ±4%, 50 mV/A (50 A ~ 70 A (peak)) ±15% Power Supply: 9 V adapter
		CP4070	Bandwidth: 300 kHz, Max. Continuous Current: 70 Arms, Peak-peak Current: 200 A, Switch Ratio: 50 mV/A, 5 mV/A, Accuracy: ±2%, Power Supply: 9 V adapter

		CP4070A	Bandwidth: 300 kHz, Max. Continuous Current: 70 Arms, Peak-peak Current: 200 A, Switch Ratio: 100 mV/A, 10 mV/A, Accuracy: 100 mV/A (50 mA ~ 10 A (peak)) ±3%, 10 mV/A (500 mA ~ 40 A (peak)) ±4%, 10 mV/A (40 A ~ 100 A (peak)) ±15% Power Supply: 9 V adapter
		CP6030	Bandwidth: 50 MHz, Max. Continuous Current: 30 Arms, Peak Current: 50 A, Switch Ratio: 1 V/A, 0.1 V/A, Accuracy: 5 A (±1% ±1 mA), 30 A (±1% ±10 mA), Power Supply: 12 V/1 A adapter
		CP6030A	Bandwidth: 100 MHz, Max. Continuous Current: 30 Arms, Peak Current: 50 A, Switch Ratio: 1 V/A, 0.1 V/A, Accuracy: 5 A (±1% ±1 mA), 30 A (±1% ±10 mA), Power Supply: 12 V/1 A adapter
		CP6150	Bandwidth: 12 MHz, Max. Continuous Current: 150 Arms, Peak Current: 300 A, Switch Ratio: 0.1 V/A, 0.01 V/A, Accuracy: 30 A (±1% ±10 mA), 150 A (±1% ±100 mA), Power Supply: 12 V/1 A adapter
		CP6500	Bandwidth: 5 MHz, Max. Continuous Current: 500 Arms, Peak Current: 750 A, Switch Ratio: 0.1 V/A, 0.01 V/A, Accuracy: 75 A (±1% ±10 mA), 500 A (±1% ±100 mA), Power Supply: 12 V/1 A adapter
Differential Probes		DPB4080	Bandwidth: 50 MHz, Differential Range: 800 V (DC + Peak AC), Attenuation Ratio: 10X/100X, Accuracy: ±1%, Power Supply: DC 6 V power
		DPB5150	Bandwidth: 70 MHz, Differential Range: 1500 V (DC + Peak AC), Attenuation Ratio: 50X/500X Accuracy: ±2 %, Power Supply: USB 5 V/1 A adapter

		DPB5150A	Bandwidth: 100 MHz, Differential Range: 1500 V (DC + Peak AC), Attenuation Ratio:50X/500X, Accuracy: ±2%, Power Supply: USB 5 V/1 A adapter
		DPB5700	Bandwidth: 70 MHz, Differential Range: 7000 V (DC + Peak AC), Attenuation Ratio: 100X/1000X, Accuracy: ±2%, Power Supply: USB 5 V/1 A adapter
		DPB5700A	Bandwidth: 100 MHz Differential Range: 7000 V (DC + Peak AC), Attenuation Ratio: 100X/1000X Accuracy: ±2%, Power Supply: USB 5 V/1 A adapter
		DPB6150A	Bandwidth: 100 MHz Differential Range: 1500 V (DC + Peak AC), Attenuation Ratio: 50X/500X Accuracy: ±2%, Power Supply: USB 5 V/1 A adapter
		DPB6150D	Bandwidth: 400 MHz Differential Range: 1500 V (DC + Peak AC), Attenuation Ratio: 100X/1000X Accuracy: ±2%, Power Supply: USB 5 V/1 A adapter
High Voltage		HPB4010	Bandwidth: 40 MHz Differential Range: DC 10 kV, AC (rms): 7 kV (sine), AC (Vpp): 20 kV (Pulse), Attenuation Ratio: 1000X, Accuracy: ≤3%
Demo Board		STB-3 Test Board	Output signals including square, sine, AM, fast edge, pulse, PWM, I^2C, CAN, LIN etc. Used in teaching and demonstrations.
Current Adapter		SCD600MA	Sampling Resistance: 0.5 Ω, Max. Working Current: 600 mA.
		SCD10A	Sampling resistance: 5 mΩ, Max. Working Current: 10 A,10 sec.

Smart Battery Charger		GSCH4000A	Input voltage: 9 ~ 26 V DC, Output current: 0 ~ 4 A, Max output power: 40 W, Charging efficiency: >85%, Dimensions (L x W x H): 180 mm x 92 mm x 58 mm, Weight without battery: 235 g.
Carrying Bag		BAG-H1	Color: Black, Dimensions (L x W x H): 325 mm x 310 mm x 95 mm, Weight: 200 g.

Ordering Information

Ordering Information		
Product Name	SHS820X 200 MHz	
	SHS810X 100 MHz	
	SHS1202X 200 MHz Isolated Input	
	SHS1102X 100 MHz Isolated Input	
Standard Accessories	USB cable -1	
	Quick start -1	
	Passive probe -2	
	Multimeter test lead -2	
	Certification -1	
	Power adapter -1	
	Battery -1	
	SCD600MA current measurement adapter -1	
	SCD10A current measurement adapter -1	
	Carrying bag -1	
Optional Accessories	STB demo source	STB-3
	High voltage probe	HPB4010
	Current probes	CP4020/CP4050/CP4070/CP4070A/CP6030/CP6030A/CP6150/CP6500
	Differential probes	DPB4080/DPB5150/DPB5150A/DPB5700/DPB5700A/DPB6150A/ DPB6150D
	Smart battery charger	GSCH4000A

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, spectrum analyzers, function/arbitrary waveform generators, RF/MW signal generators, 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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