

# SHS1000 Series

## Handheld Digital Oscilloscope



DataSheet-2020.03

# SHS1102 SHS1062

## Introduction

SHS1000 series are dual isolated channel handheld oscilloscopes with patent IsolatedChannel technology. SHS1000 series integrate functions as Oscilloscope, Multimeter and Recorder.

SHS1000 Series provides isolation from ground and isolation between channels allowing you to take floating measurements without worrying about damaging circuitry.

100 MHz Bandwidths, 1GS/s real-time sampling per channel, up to 50GSa/s equivalent sampling rate, 2Mpts memory depth. Support Scope TrendPlot, Meter TrendPlot and Scope Waveform Record, record length up to 7Mpts. 5.7 inch TFT color LCD display. Support USB storage and internal memory. Battery included, handheld available, convenient for outdoor measurement.

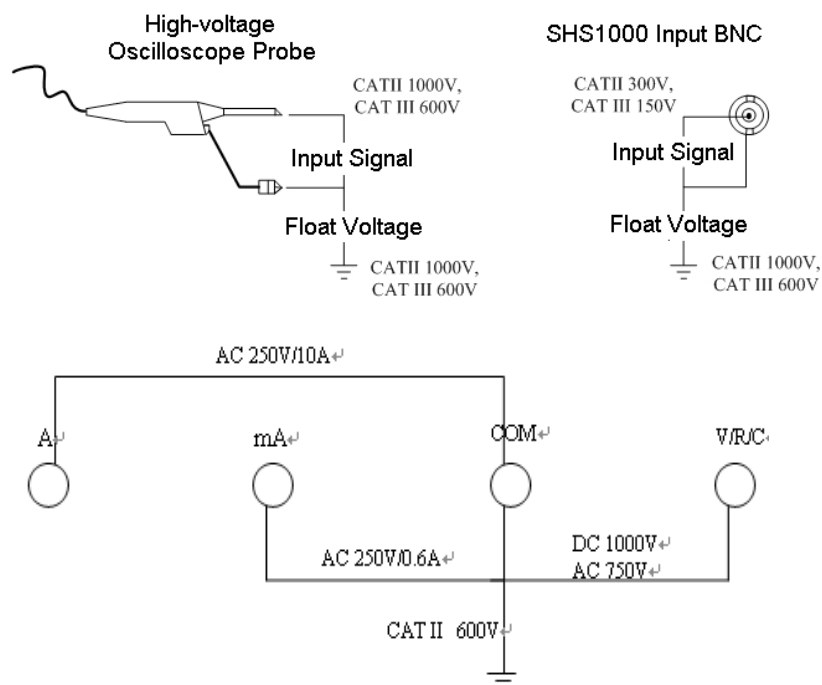
## Applications

- Power electronics test, such as Switch mode power supply, Inverter, Converter and Lighting electronics.
- Wind power, PV power and other new energy equipment test
- Automotive electronic, electric vehicles test
- Industrial Power systems strong power test
- Electrical industrial site commissioning and test
- Field test
- Applications from microelectronic circuits to power electronics, in fields floating measurements or locale site measurements needed
- Education

## Features & Benefits

- SHS1000 Series have 2 channels; provide functions as Oscilloscope, Multimeter and Recorder (TrendPlot and waveform Recorder).
- SHS1000 Series with patent isolated channel technology provide isolation from ground and isolation between channels
- CATIII1000V and CATIII600V between two channels references, between channels reference and earth ground  
CATIII600V and CATIII300V between channels reference and Multimeter input reference
- CATIII300V and CATIII150V input direct  
CATIII1000V and CATIII600V input with 10: 1 probe
- 5.7 inch TFT color LCD display
- 100MHz Bandwidth, 1GS/s real-time sampling per channel, up to 50GSa/s equivalent sampling rate, 2Mpts memory depth
- 6000 counts Multimeter, provides measurements of DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity
- Support Scope TrendPlot, Meter TrendPlot and Scope Recorder
- Automatic and manual trigger modes  
Trigger types: Edge, Pulse, Video, Slope and Alternative
- 32 automatic waveform measurements, 3 cursor measure modes
- Digital Filter functions:  
Low pass filter, High pass filter, Band pass filter, Band limit filter
- Math functions: +, -, ×, ÷, FFT operations
- Multiple Language User Interface
- Standard setup interface: USB Device, USB Host
- Support USB storage and update
- Rechargeable battery and battery charger / line power adapter included

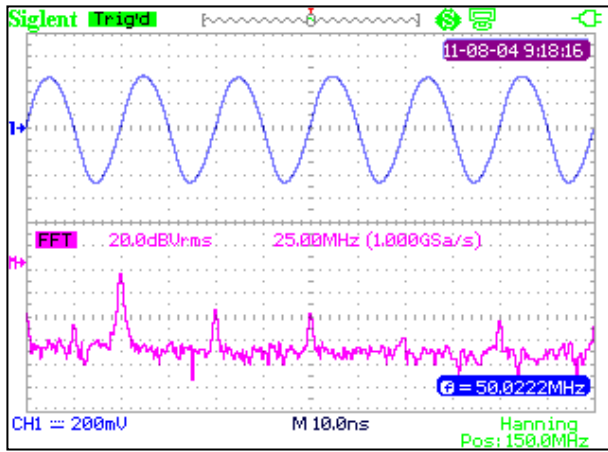
## Isolated input, make measurements in security



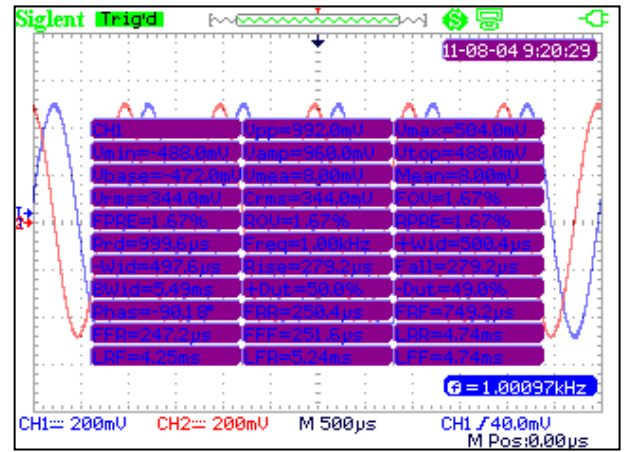
- Patent IsolatedChannel technology used in SHS1000 series oscilloscopes, dual channel, and 100MHz bandwidth
- CATII300V and CATIII150V maximum BNC input voltage direct, CATII1000V and CATIII600V with standard 10:1 probe
- CATII1000V and CATIII600V maximum voltage between two channels references
- CATII600V and CATIII300V maximum voltage between Multimeter input reference and the ground

## High-performance oscilloscope

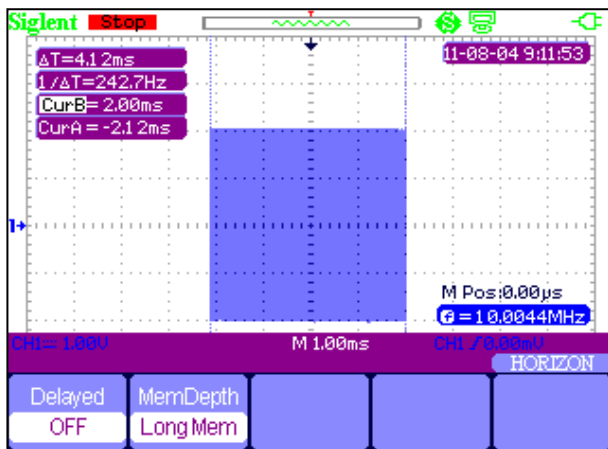
- The SHS1000 series channels are isolated from each other; real-time sampling rate is up to 1GSa/s per channel, equivalent sampling rate up to 50GSa/s
- 2Mpts memory depth
- Dynamic and broad input voltage range, 5mV/div~100V/div direct input
- Math functions: +, -, ×, ÷, and FFT
- Digital Filter functions:
  - Low pass filter, High pass filter, Band pass filter, Band limit filter
- 32 types of automatic waveform measurements, 3 cursor measure modes
- Automatic and manual trigger modes
  - Trigger types: Edge, Pulse, Video, Slope and Alternative
- Support EasyScopeX software
- Multiple Language User Interface, support Multilingual help system online



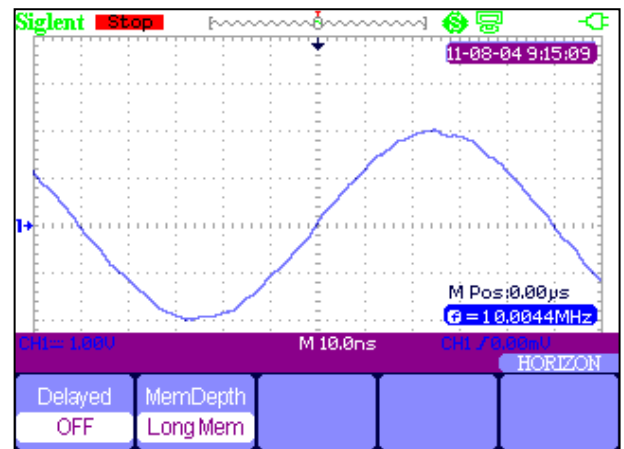
FFT



32 types of measurements



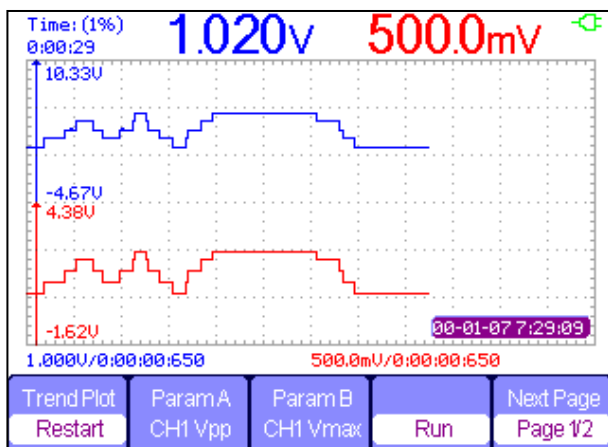
Long Memory



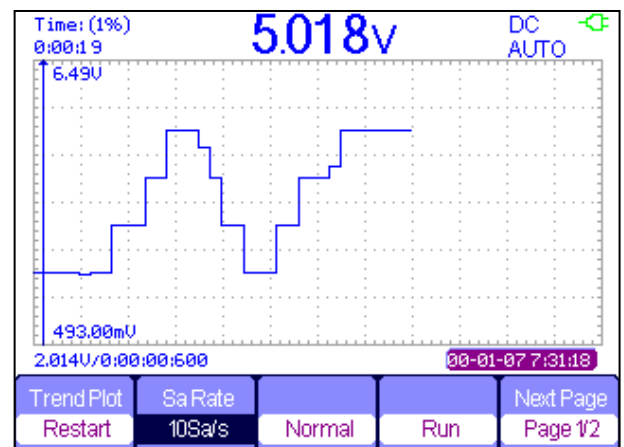
Long Memory

## TrendPlot

- Scope TrendPlot records scope measurement data in scan mode, 800K points capacity, more than 24 hours recording time
- Meter TrendPlot records multimeter measurement data, 1.2M points recording depth, at 0.5GSa/s, recording time 8120 hours
- Recording results export available, convenient for further analysis
- Two kinds of display mode, 'ALL' and 'NORMAL'; support zoom and cursor
- Support recording real time



Scope TrendPlot



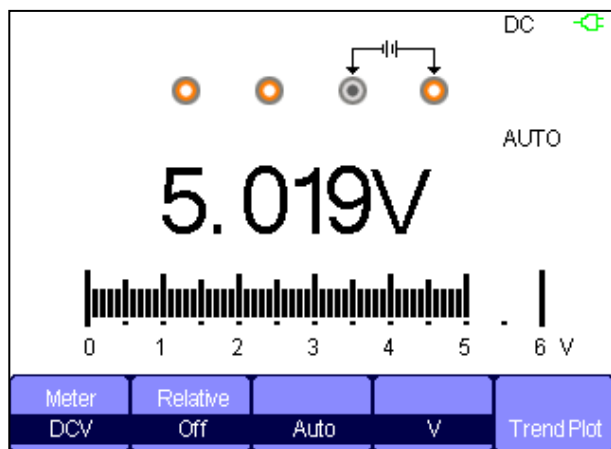
Meter TrendPlot

## Scope Recorder

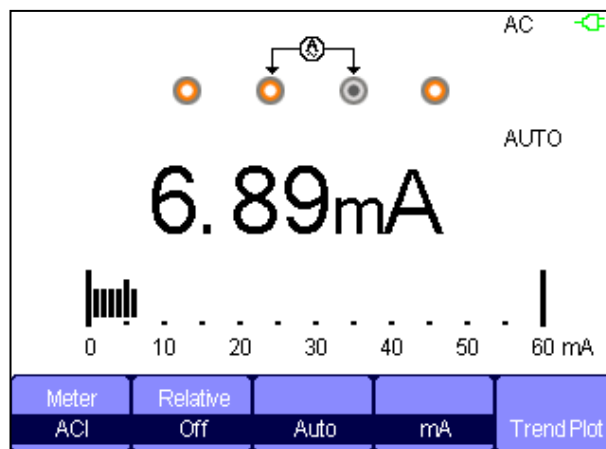
- Recording scope waveform continually in scan mode
- Support recording, replay and zoom function
- 7M points memory depth, 18 hours recording time
- 4GB in USB storage mode, 3000 hours recording time

## Multimeter

- 6000 counts high performance Multimeter
- Providing measurements of DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity



DCV measurement



ACI measurement

## Specification

| Scope                    |                                                      |                       |
|--------------------------|------------------------------------------------------|-----------------------|
| Type                     | SHS1062                                              | SHS1102               |
| Bandwidth                | 60MHz                                                | 100MHz                |
| Rise Time                | ≤ 5.8ns                                              | ≤ 3.5ns               |
| Real Time Sampling Rate  | Single Channel: 1GSa/s,<br>Double Channels: 500MSa/s |                       |
| Equivalent Sampling Rate | 50GSa/s                                              |                       |
| Memory Depth             | 2Mpts                                                |                       |
| Time Base Range          | 5 ns/ div – 50s/ div                                 | 2.5ns/ div – 50s/ div |
| Scan Range               | 100ms/ div ~ 50s/ div                                |                       |
| Vertical Sensitivity     | 5mV/div – 100V/div(1-2-5 order)                      |                       |
| Vertical Resolution      | 8 bits                                               |                       |
| Trigger Types            | Edge, Pulse, Video, Slope, Alternative               |                       |
| Frequency Counter        | 6 bits                                               |                       |
| Connection               | USB Device, USB Host                                 |                       |
| Math                     | +, -, *, / , FFT                                     |                       |
| Oscilloscope Trend Plot  | 800K points                                          |                       |

| Meter                                    |                    |            |               |
|------------------------------------------|--------------------|------------|---------------|
| Maximum Resolution                       | 6000               |            |               |
| Function                                 | Range              | Resolution | accuracy      |
| DC Voltage                               | 60.00 mV           | 10uV       | (±1%±15digit) |
|                                          | 600.0mV            | 100uV      | (±1%±5digit)  |
|                                          | 6.000V             | 1mV        |               |
|                                          | 60.00V             | 10mV       |               |
|                                          | 600.0V             | 100mV      |               |
|                                          | 1000 V             | 1V         |               |
| AC Voltage (20Hz ~ 400Hz)                | 60.00 mV           | 10uV       | (±1%±15digit) |
|                                          | 600.0mV            | 100uV      | (±1%±5digit)  |
|                                          | 6.000V             | 1mV        |               |
|                                          | 60.00V             | 10mV       |               |
|                                          | 600.0V             | 100mV      |               |
|                                          | 750 V              | 1V         |               |
| DC Current <sup>(1)</sup>                | 60.00 mA           | 10uA       | (±4%±10digit) |
|                                          | 600.0mA            | 100uA      | (±5%±5digit)  |
|                                          | 6.000 A            | 1mA        |               |
|                                          | 10.00 A            | 10mA       |               |
| AC Current <sup>(2)</sup> (20Hz ~ 400Hz) | 60.00 mA           | 10uA       | (±4%±10digit) |
|                                          | 600.0mA            | 100uA      | (±4%±5digit)  |
|                                          | 6.000 A            | 1mA        | (±5%±5digit)  |
|                                          | 10.00 A            | 10mA       |               |
| Resistance                               | 600.0Ω             | 0.1Ω       | (±1%±5digit)  |
|                                          | 6.000KΩ            | 1Ω         |               |
|                                          | 60.00KΩ            | 10Ω        |               |
|                                          | 600.0KΩ            | 100Ω       |               |
|                                          | 6.000MΩ            | 1kΩ        |               |
|                                          | 60.00MΩ            | 10kΩ       | (±4%±5digit)  |
| Capacitance                              | 40.00nF            | 0.01nF     | (±4%±10digit) |
|                                          | 400.0nF            | 0.1nF      | (±5%±5digit)  |
|                                          | 4.000uF            | 1nF        |               |
|                                          | 40.00uF            | 10nF       |               |
|                                          | 400.0uF            | 100nF      |               |
| Diode                                    | 0 ~ 2V             |            |               |
| Continuity                               | <50Ω Buzzer sounds |            |               |

Note: [1], [2] For rank A range, the measurement time should be less than 10s, the interval time should be more than 15 minutes.

## Technical Specifications

### Oscilloscope

#### Acquisition System

|                |                                   |
|----------------|-----------------------------------|
| Sampling Types | Real time, Equivalent             |
| Sampling Mode  | Sampling, Peak detection, Average |
| Average Times  | 4, 16, 32, 64, 128, 256           |

#### Input System

|                                                             |                                                 |                                        |
|-------------------------------------------------------------|-------------------------------------------------|----------------------------------------|
| Input Coupling                                              | AC, DC, GND                                     |                                        |
| Input Impedance                                             | 1MΩ±2% , 18pf±3pf                               |                                        |
| Probe Attenuation Factor                                    | 10X                                             |                                        |
| Probe Attenuation Factors Set(V)                            | 1X, 5X , 10X, 50X , 100X, 500X , 1000X          |                                        |
| channels from earth ground, between two channels references | Overvoltage Category<br>CAT I&CAT II<br>CAT III | Maximum Voltage<br>1000Vrms<br>600Vrms |
| between Multimeter input reference and the ground           | Overvoltage Category<br>CAT I&CAT II<br>CAT III | Maximum Voltage<br>600Vrms<br>300Vrms  |
| Max. input Voltage for BNC                                  | Overvoltage Category                            | Maximum Voltage                        |
|                                                             | 1x CAT I&CAT II                                 | 300Vrms                                |
|                                                             | 1x CAT III                                      | 150Vrms                                |
|                                                             | 10x CAT I&CAT II                                | 1000Vrms                               |
|                                                             | 10x CAT III                                     | 600Vrms                                |
| Max. input Voltage for Multimeter input port                | Voltage port                                    | DC 1000V, AC 750V                      |
|                                                             | Current port(mA)                                | AC 250V/10A                            |
|                                                             | Current port(A)                                 | AC 250V/600mA                          |
| Single Channel Common Mode Rejection, typical               | >100:1 50MHz                                    |                                        |
| Channel-to-Channel Isolation                                | >35dB                                           |                                        |

#### Horizontal System

|                        |                                                                                 |             |        |       |
|------------------------|---------------------------------------------------------------------------------|-------------|--------|-------|
| Real time Sample Rate  | Single Channel :50Sa/s ~ 1GSa/s<br>Double Channels: 500MSa/s                    |             |        |       |
| Equivalent Sample Rate | 50GSa/s                                                                         |             |        |       |
| Interaction Mode       | Line, (Sinx)/x                                                                  |             |        |       |
| Memory Depth           | Channel Mode                                                                    | Sample Rate | Normal | Deep  |
|                        | Single Channel                                                                  | 1Gsa/s      | 40kpts | 2Mpts |
|                        | Double Channels                                                                 | ≤ 500MSa/s  | 20kpts | 1Mpts |
| Display Mode           | MAIN, WINDOW, ZOOM, SCAN, X-Y                                                   |             |        |       |
| Time Base Accuracy     | ±50ppm (measured over 1ms interval)                                             |             |        |       |
| Horizontal Scan Range  | 2.5ns/div ~ 50s/div(SHS1000)<br>Scan mode: 100ms/div ~ 50s/div (1-2.5-5 order ) |             |        |       |

## Vertical System

|                                          |                                                                                                               |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Vertical Sensitivity                     | 5mV/div - 100V/div(1-2-5 order )                                                                              |
| Channel Voltage Offset Range             | 5mV-200mV: $\pm 1.6V$<br>206mV-10V: $\pm 40V$<br>10.2V-100V: $\pm 400V$                                       |
| Vertical Resolution                      | 8 bit                                                                                                         |
| Channels                                 | 2                                                                                                             |
| Analog Bandwidth                         | 100MHz (SHS1102) 60MHz(SHS1062)                                                                               |
| Single Bandwidth                         | 100MHz (SHS1102) 60MHz(SHS1062)                                                                               |
| Lower Frequency(AC-3dB)                  | $\leq 10Hz$ (at input BNC)                                                                                    |
| DC Gain Accuracy                         | 5mv/div-100v/div: $\leq \pm 3\%$                                                                              |
| DC Measurement Accuracy $\leq 100mv/div$ | $\pm [3.0\% \times (  \text{reading}   +   \text{offset}  ) + 1\% \times   \text{offset}   + 0.2div + 2mV]$   |
| DC Measurement Accuracy $> 100mv/div$    | $\pm [3.0\% \times (  \text{reading}   +   \text{offset}  ) + 1\% \times   \text{offset}   + 0.2div + 100mV]$ |
| Rise Time                                | 3.5ns Typical (SHS1102)<br>5.8ns Typical (SHS1062)                                                            |
| Vertical Input Coupling                  | AC, DC, GND                                                                                                   |
| Math Operation                           | +, -, *, / , FFT                                                                                              |
| FFT                                      | Window Mode: Hanning, Hamming, Blackman, Rectangular<br>Sampling: 1024 points                                 |
| Bandwidth Limiter                        | 20MHz (-3dB)                                                                                                  |

## Trigger System

|                      |                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------|
| Trigger Types        | Edge, Pulse Width, Video, Slope, Alternative                                                                           |
| Trigger Source       | CH1, CH2                                                                                                               |
| Trigger Modes        | Auto, Normal, Single                                                                                                   |
| Trigger Coupling     | AC, DC, LF rej, HF rej                                                                                                 |
| Trigger Level Range  | CH1, CH2: $\pm 6$ divisions from center of screen                                                                      |
| Trigger Displacement | Pre-trigger: (Memory depth/(2*sampling)),<br>Delay Trigger: 268.04div                                                  |
| Holdoff Range        | 100ns - 1.5s                                                                                                           |
| Edge Trigger         | Edge Type: Rising, Falling, Rising and Falling                                                                         |
| Pulse Width Trigger  | Trigger Modes: ( > , < , = ) Positive Pulse Width, ( > , < , = ) Negative Pulse Width<br>Pulse Width Range: 20ns - 10s |
| Video Trigger        | Support Signal Formats: PAL/SECAM, NTSC<br>Trigger Condition : Odd Field, Even Field, All Lines, Line Num              |
| Slope Trigger        | ( > , < , = ) Positive slope, ( > , < , = ) Negative slope<br>Time: 20ns-10s                                           |
| Alternative Trigger  | CH1 Trigger Type: Edge, Pulse, Video, Slope<br>CH2 Trigger Type: Edge, Pulse, Video, Slope                             |

## X-Y Mode

|                            |                                                                                                                     |
|----------------------------|---------------------------------------------------------------------------------------------------------------------|
| X-Pole Input /Y-Pole Input | Channel 1 (CH1) / Channel 2 (CH2)                                                                                   |
| Sample Frequency           | XY mode has a breakthrough that trad oscilloscopes restrict sampling rate at 1MSa/s and supports 5KSa/s ~ 500MSa/s: |

## Measure System

|                         |                                                                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto Measure (32 Types) | Vpp, Vmax, Vmin, Vamp, Vtop, Vbase, Vavg, Mean, Crms, Vrms, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Rise time, Fall time, Freq, Period, + Wid, - Wid, + Dut, - Dut, BWid, Phase, FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF |
| Cursor Measure          | Manual mode, Track mode and Auto mode                                                                                                                                                                                     |

## Control Panel Function

|             |                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Auto Set    | Auto adjusting the Vertical, Horizontal system and Trigger Position                                                                                       |
| Save/Recall | Support 2 group referenced waveforms, 20 group setups, 10 group captured waveforms internal storage/recall function and USB flash driver storage function |

## Hard Ware Frequency Counter

|                    |                                                                              |
|--------------------|------------------------------------------------------------------------------|
| Reading Resolution | 1Hz                                                                          |
| Range              | DC Couple, 10Hz to MAX Bandwidth                                             |
| Signal Types       | Satisfying all Trigger signals(Except Pulse width trigger and Video Trigger) |

## • Multimeter

|                    |                                                                |
|--------------------|----------------------------------------------------------------|
| Maximum Resolution | 6000 counts                                                    |
| Measure Function   | DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance, Continuity |
| Max Input Voltage  | AC(Vrms): 750V (AC frequency :20Hz~400Hz)DC :1000V             |
| Max Input Current  | AC (Vrms) : 10A (AC frequency :20Hz~400Hz)DC : 10A             |
| Impedance          | 10MΩ                                                           |

## • Recorder

### Scope TrendPlot

|                |                                 |
|----------------|---------------------------------|
| Display        | All, Normal                     |
| Record Size    | 800K points, more than 24 hours |
| Record Channel | 2 channels                      |
| Cursor, Zoom   | Yes                             |
| Manual Mode    | Yes                             |

### Meter TrendPlot

|                |             |
|----------------|-------------|
| Display        | All, Normal |
| Record Size    | 1.2M points |
| Record Channel | 1 channel   |
| Cursor, Zoom   | Yes         |
| Manual Mode    | Yes         |

## Scope Record

|                  |                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function         | Record scope waveforms, Replay recorded waveforms                                                                                                                                                                                                 |
| Acquisition Mode | Scan Mode                                                                                                                                                                                                                                         |
| Time             | Record mode: recording time<br>Replay mode: replay time                                                                                                                                                                                           |
| Sets             | Viewer: full screen, split screen<br>Record mode: continuous, single<br>Replay mode: point, frame<br>Save mode: Internal memory                                                                                                                   |
| Default          | Viewer: split screen<br>Record mode: continuous<br>Replay mode: point<br>Save mode: Internal memory                                                                                                                                               |
| Record Size      | Total: 7M points<br>Single channel: 7M points single channel<br>Double channels: 3.5M points per channel<br>At different time base, get max record time , e.g. time base 100ms, each point counts 0.04ms,<br>Total Time = 7000000*0.04ms = 4.6min |
| Record Manual    | Start, Pause, Stop, Continue                                                                                                                                                                                                                      |
| Replay Manual    | Start, Pause, Stop, Continue, Previous, Next,                                                                                                                                                                                                     |

## Generic Specification

### Display System

|                        |                                                                                                                                   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Display Mode           | 5.7 inch TFT color LCD                                                                                                            |
| Resolution             | 320 horizontal by 234 vertical pixels                                                                                             |
| Display Color          | 24 bit                                                                                                                            |
| Display Contrast       | 150:1                                                                                                                             |
| Backlight Intensity    | 300nit                                                                                                                            |
| Waveform Display Range | 8 x 12 div                                                                                                                        |
| Waveform Display Mode  | Point, Vector                                                                                                                     |
| Persist                | Off, 1 sec, 2 sec, 5 sec, Infinite                                                                                                |
| Menu Display           | 2 sec, 5 sec, 10 sec, 20 sec, Infinite                                                                                            |
| Screen-Saver           | Off, 1min, 2min, 5min, 10min, 15min, 30min, 1hour, 2hour, 5hour                                                                   |
| Skin                   | Classical, Modern, Tradition, Succinct                                                                                            |
| Waveform Interpolation | Sinx, X                                                                                                                           |
| Color model            | Normal , Invert                                                                                                                   |
| Language               | Simplified Chinese, Traditional Chinese, English, Arabic, French, German, Russian, Spanish, Portuguese, Japanese, Korean, Italian |

### Power

|                    |                                           |                   |
|--------------------|-------------------------------------------|-------------------|
| Line Power Adapter | Input voltage                             | 100V-240V 50/60Hz |
|                    | Output voltage                            | 9V 4A             |
| Battery            | 7.4VDC, 5000mAh, persisting about 4 hours |                   |
| Charge time        | About 4 hours                             |                   |

| Environments                  |                                                                                                                 |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Temperature                   | Operating: 0 ~ 45°C<br>Storage: -20°C ~ 70°C                                                                    |
| Cooling                       | Internal fan used                                                                                               |
| Humidity                      | 85% RH, 40°C                                                                                                    |
| Height                        | 3000m                                                                                                           |
| Electromagnetic Compatibility | 2004/108/EC Directive<br>Applicable standards EN 61326-1:2006<br>EN 61000-3-2:2006 + A2:2009/ EN 61000-3-3:2008 |
| Safety                        | 2006/95/EC Low Voltage Directive<br>EN 61010-1:2010/EN 61010-031:2002+A1:2008                                   |

| Mechanical |        |         |
|------------|--------|---------|
| Size       | length | 259.5mm |
|            | width  | 163.2mm |
|            | height | 53.3mm  |
| Weight     | 1.5Kg  |         |

## Ordering Information

- SHS1000 series Handheld Digital Oscilloscope

| Model   | TYPE   |
|---------|--------|
| SHS1102 | 100MHz |
| SHS1062 | 60MHz  |

| Standard accessories                                                    |
|-------------------------------------------------------------------------|
| A 9V, 4A, power adapter                                                 |
| Two special 10: 1, CATII 1000V, CATIII 600V, 100MHz oscilloscope probes |
| Two test leads for multimeter                                           |
| Probe calibration accessory                                             |
| A USB data transmitting cable                                           |
| Quick start                                                             |
| Certificate of calibration                                              |

# SHS1000 Series

## Handheld Digital Oscilloscope



### About SIGLENT

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

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

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