

Product Datasheet - Technical Specifications



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DataSheet

SHS800 Series Handheld Digital Oscilloscope

SHS820/SHS815/SHS810/SHS806



Application Domain

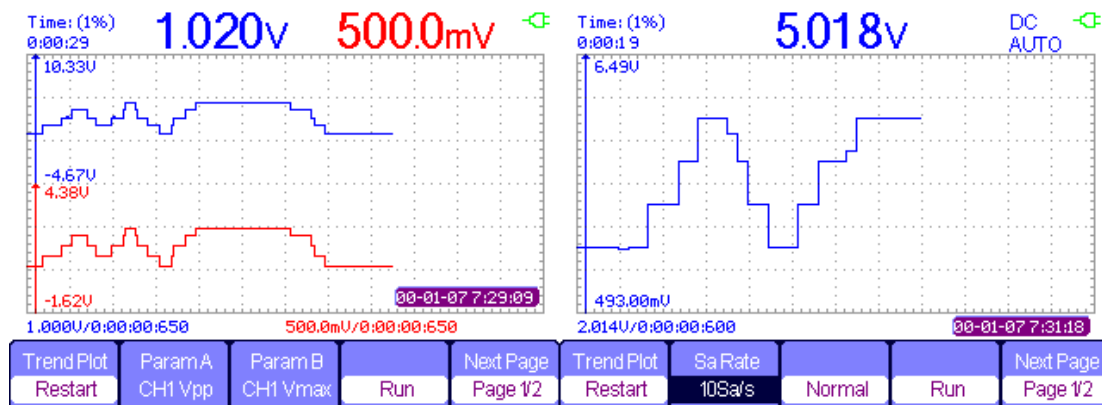
- ◆ Outdoor measure
- ◆ Circuit measure
- ◆ Wind power, PV power and other new energy equipment test
- ◆ Automotive electron, electric automobile test
- ◆ Electric power system, strong electricity test
- ◆ Industry scenes electric debug testing and measuring
- ◆ Education and science research
- ◆ Quality control

Features & Benefits

- ◆ Dual-input,combine oscilloscope, Multimeter and recorder (including TrendPlot and waveform Recorder) in one unit
- ◆ Input voltage: input voltage through BNC is up to CAT II 300V and CAT III 150V
Standard probe: 10X CAT II 400V
Optional probe: 10X CAT II 1000V and 10X CAT III 600V
Oscilloscope and multimeter safety grade is up to CAT II 600V and CAT III 300V
- ◆ 5.7 inch TFT color LCD display
- ◆ Max. 200MHz Bandwidth, 1GSa/s real-time sampling rate single channel, up to 50GSa/s equivalent sampling rate
- ◆ With 6000 dots display resolution Multimeter and provides measurements of DCV, ACV, DCI, ACI, Resistance, Diode, Capacitance and Continuity
- ◆ Support Scope TrendPlot, Meter TrendPlot and Scope Recorder
- ◆ Trigger modes :Automatic , Normal and Single
Trigger types: Edge, Pulse, Video, Slope and Alternative
- ◆ 32 automatic measurements, 3 cursor measure modes
- ◆ 4 digital filter mode: Low pass,High pass, Band pass, Band limit
- ◆ Math functions: +, -, ×, ÷, FFT operations
- ◆ Multiple Language User Interface
- ◆ Standard configuration interface: USB Device,USB Host
- ◆ Support USB storage and update; support PC remote control and PictBridge print
- ◆ Rechargeable Li battery pack,compact,portable,fit for outdoor operation

TrendPlot

- ◆ Scope TrendPlot records scope measurement data, 800K points capacity, more than 18 hours recording time
- ◆ Meter TrendPlot records multimeter measurement data, 1.2M points recording length, recording time as long as 6000 hours at 0.05Sa/s
- ◆ Real-time saving measuring data,which can be outputted to U memery,used for second research and analyzing
- ◆ Two display modes, 'ALL' and 'NORMAL'; support zoom and cursor
- ◆ Support recording real time



Scope TrendPlot

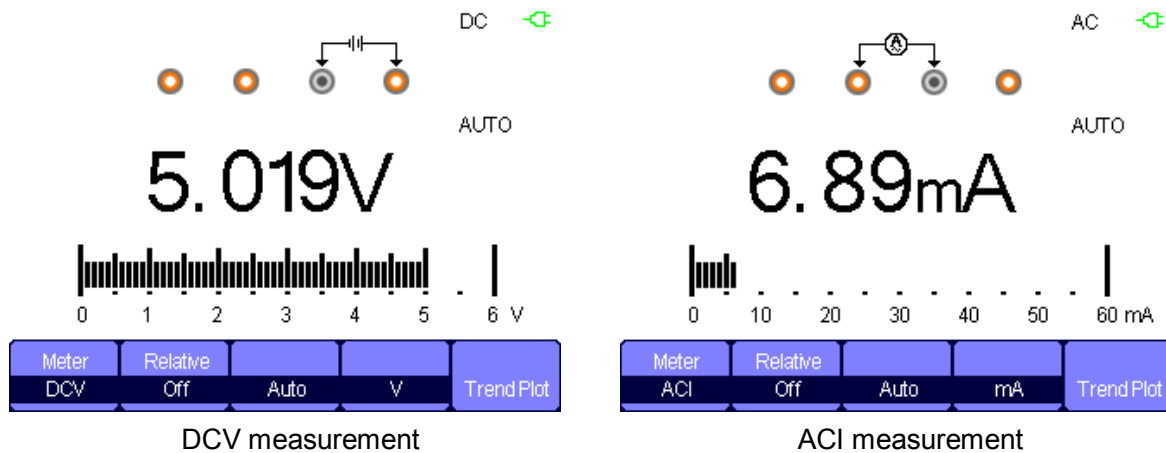
Meter TrendPlot

Scope Recorder

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

Multimeter

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



Specification

| Scope | | | | |
|--------------------------|--|------------------------|--------|----------|
| Type | SHS806 | SHS810 | SHS815 | SHS820 |
| Bandwidth | 60MHz | 100MHz | 150MHz | 200MHz |
| Rise Time | ≤5.8ns | ≤3.5ns | ≤2.3ns | ≤1.7ns |
| Input Impedance | 1MΩ±2%, 18pf±3pf | | | |
| Real Time Sampling Rate | Single Channel: 1GSa/s, Double Channels: 500MSa/s | | | 500MSa/s |
| Equivalent Sampling Rate | 50GSa/s | | | |
| Time Base Range | 5 ns/ div ~ 50s/ div | 2.5 ns/ div ~ 50s/ div | | |
| Scan Range | 100ms/ div ~ 50s/ div | | | |
| Vertical Sensitivity | 2mV/div ~ 100V/div(1-2-5 step) | | | |
| 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 counts | | |
| 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 | (±1.5%±5digit) |
| DC Current ^[1] | 60.00 mA | 10uA | (±4%±5digit) |
| | 600.0mA | 100uA | |
| | 6.000 A | 1mA | (±5%±5digit) |
| | 10.00 A | 10mA | |
| AC Current ^[2] (20Hz~400Hz) | 60.00 mA | 10uA | (±4%±5digit) |
| | 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 | (±4%±5digit) |
| | 60.00MΩ | 10kΩ | |
| 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 | 1X, 10X | |
| Probe Attenuation Factors Set | 1X, 5X, 10X, 50X, 100X, 500X, 1000X | |
| Max. Voltage From BNC (Reference BNC Cover) | CAT II | 300Vrms |
| | CAT III | 150Vrms |
| Standard Probe 10X | CAT II | 400Vrms |
| Optional Probe 10X | CAT II | 1000Vrms |
| Max. Floating Voltage From Multimeter Reference to Earth Ground | CAT II | 600Vrms |
| | CAT III | 300Vrms |
| Single Channel Common Mode Rejection Ratio | >100:1 50MHz | |
| Channel-to-Channel Isolation | >35dB | |

| Horizontal System | | | | | |
|-----------------------|----------------------------|--|-------------|--------|-------------|
| Real time Sample Rate | | Single Channel :50Sa/s~1GSa/s Double Channels: 50Sa/s~500MSa/s | | | |
| Interaction Mode | | x, Sinx | | | |
| Memory Depth | SHS806 SHS810 SHS815 | Channel Mode | Sample Rate | Normal | Long Memory |
| | | Single Channel | 1GSa/s | 40kpts | Non-support |
| | | Single Channel | ≤ 500MSa/s | 20kpts | 2 Mpts |
| | Double Channels | ≤ 500MSa/s | 20kpts | 1 Mpts | |
| | SHS820 | Single Channel:32Kpts; Double Channel:16Kpts | | | |
| Display Mode | | MAIN, WINDOW ZOOM, SCAN, X-Y | | | |
| Time Base Accuracy | | ±50ppm (measured over 1ms interval) | | | |
| Horizontal Scan Range | | 2.5ns/div ~ 50s/div (SHS820) 2.5ns/div ~ 50s/div (SHS815) 2.5ns/div ~ 50s/div (SHS810) 5.0ns/div ~ 50s/div (SHS806) Scan mode: 100ms/div ~ 50s/div (1-2.5-5 step) | | | |

| Vertical System | |
|-------------------------------------|--|
| Vertical Sensitivity | 2mV/div – 100V/div(1-2-5 step) |
| Channel Voltage Offset Range | 2mV-200mV: ±1.6V 206mV-10V: ±40V 10.2V-100V: ±400V |
| Vertical Resolution | 8 bit |
| Channels | 2 |
| Analog Bandwidth | 200MHz (SHS820) 150MHz(SHS815) 100MHz (SHS810) 60MHz(SHS806) |
| Lower Frequency(AC-3dB) | ≤10Hz |
| DC Gain Accuracy | 5mv/div-100v/div:≤±3% 2mv/div:≤±4% |
| DC Measurement Accuracy ≤200mv/div | ±[3.0%*(reading + offset)+1% * offset +0.2div+2mV] |
| DC Measurement Accuracy > 200mv/div | ±[3.0%*(reading + offset)+1% * offset +0.2div+100mV] |
| Rise Time | ≤1.7ns (SHS820) ≤2.3ns (SHS815) ≤3.5ns (SHS810) ≤5.8ns (SHS806) |
| Vertical Input Coupling | AC, DC, GND |
| Math Operation | +, -, *, /, FFT |
| FFT | Window Mode: Hanning, Hamming, Blackman, Rectangular |
| | Sampling: 1024 points |
| Bandwidth Limit | 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 Reject, HF Reject |
| Trigger Level Range | CH1, CH2: ±6 divisions from center of screen |
| Trigger Displacement | Pre-trigger: Memory depth/(2*sampling) 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 |
| | Pulse Width Range: 20ns – 10s |
| Video Trigger | Support Signal Formats: PAL/SECAM, NTSC |
| | Trigger Condition : Odd Field, Even Field, All Lines, Line Num |
| Slope Trigger | (>, <, =) Positive slope, (>, <, =) Negative slope |
| | Time: 20ns-10s |
| Alternative Trigger | CH1 Trigger Type: Edge, Pulse, Video, Slope |
| | CH2 Trigger Type: Edge, Pulse, Video, Slope |

| | |
|----------------------------|-----------------------------------|
| X-Y Mode | |
| X-Pole Input /Y-Pole Input | Channel 1 (CH1) / Channel 2 (CH2) |
| Sample Frequency | 25Ksa/s~250MSa/s (1-2.5-5 step) |

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

| | |
|-------------------------------|---|
| Control Panel Function | |
| Auto Set | Auto adjusting the Vertical system, Horizontal system and Trigger Position |
| Save/Recall | 2 groups of referenced waveforms, 20 groups of setups, 10 groups of captured waveforms internal save/recall function and USB flash driver storage function. |

| | |
|------------------------------------|---|
| Hard Ware Frequency Counter | |
| Reading Resolution | 1Hz |
| Range | DC Couple, 10Hz to MAX Bandwidth |
| Signal Types | Applying to all Trigger signals(Except 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 18 hours |
| Record Channel | 2 channels |
| Cursor, Zoom | Support |
| Manual Mode | Support |

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

| Scope Record | |
|---------------------|---|
| Function | Record scope waveforms, Replay recorded waveforms |
| Acquisition Mode | Scan Mode |
| Time | Record mode: recording time Replay mode: replay time |
| Sets | Viewer: full screen, split screen ; Replay mode: point, frame ; Record mode: continuous, single Save mode: Internal memory |
| Default | Viewer: split screen; Replay mode: point ; Record mode: continuous Save mode: Internal memory |
| Record Size | Total: 7M points Single channel: 7M points single channel Double channels: 3.5M points per channel |
| 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 bits |
| Display Contrast (Typical state) | 150:1 |
| Backlight Intensity (Typical state) | 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 |
| Waveform Interpolation | Sin(x), 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 5 hours | |
| Charge time | About 4 hours | |

| Environments | | |
|----------------------------------|--|----------|
| Temperature | Operating | 0~40℃ |
| | Storage | -20℃~70℃ |
| Cooling | Natural Cool | |
| Humidity | 85%RH, 40℃ | |
| Height | 3000m | |
| 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 61010-031:2002+A1:2008 | |

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

Type Selections:

| Product Type | Bandwidth | Real Time Sampling Rate |
|---------------|---------------|-------------------------|
| SHS820 | 200MHz | 500MSa/s |
| SHS815 | 150MHz | 1GSa/s |
| SHS810 | 100MHz | 1GSa/s |
| SHS806 | 60MHz | 1GSa/s |

Standard accessories:

A 9V, 4A, power adapter

Two 1X/10X oscilloscope probes

Two test leads for multimeter

Probe calibration accessory

A USB data transmitting cable

User Manual

Warranty Card

Optional probe


100MHz high-voltage safety probe CAT II 1000V,CAT III 600V

200MHz high-voltage safety probe CAT II 1000V,CAT III 600V