

# SHA850A

# Spectrum & Network Analyzer



## DataSheet

EN\_02B





## General Description

The SIGLENT SHA850A, a handheld portable spectrum analyzer and cable-and-antenna analyzer, is a powerful and flexible tool for those field and outdoor RF applications. Including communication engineering, telecom operation and maintenance, radio management, factory production, education and teaching and many other fields.

With a frequency range up to 7.5 GHz, the analyzer delivers reliable automatic measurements and multiple modes of operation. A spectrum analyzer, including built-in amplifier and independent signal source, fast scanning speed, high sensitivity, can achieve broadcast monitoring, channel power scanning, wireless interference location, power monitoring, electromagnetic compatibility, and other functions. A cable and antenna tester including built-in DC voltage bias, with a 1-path-2-port vector network analysis function, can measure TDR, VSWR, port matching debugging, insertion loss measurement, tower amplifier debugging, cable fault location, Smith chart, etc.

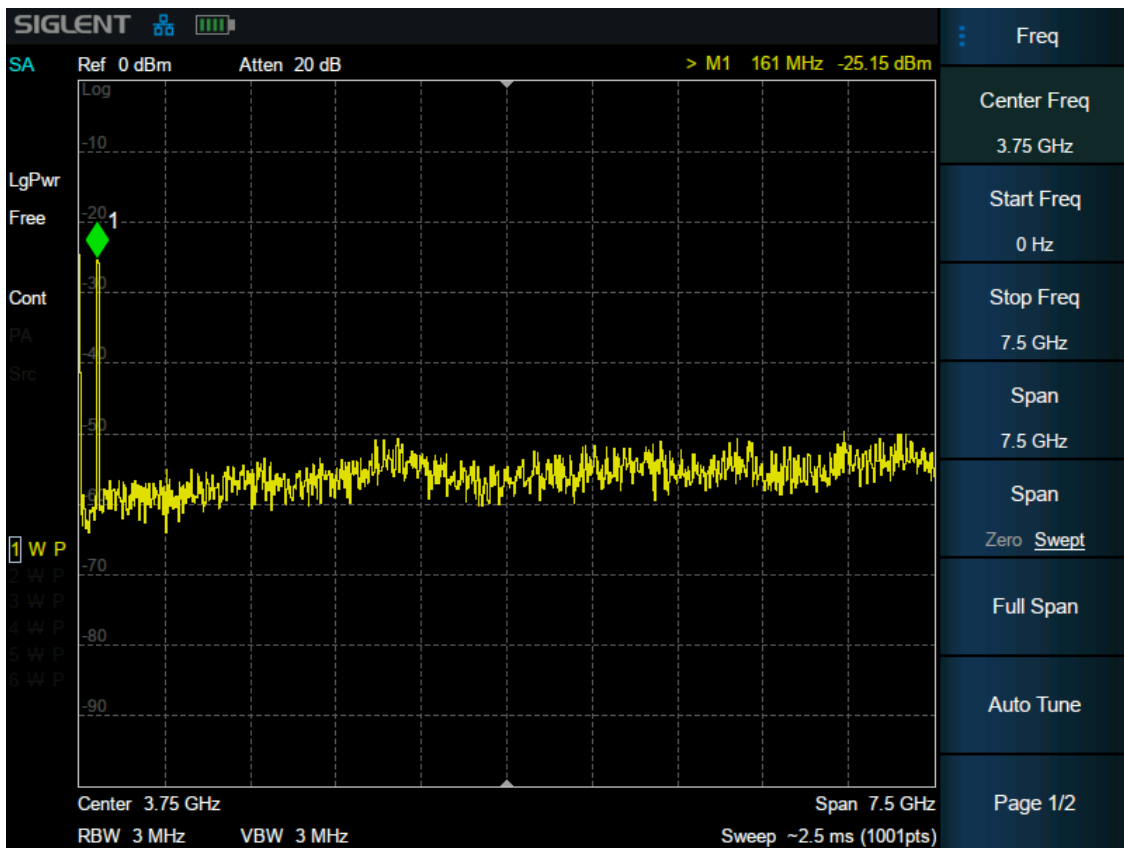
## Features and Benefits

- ◆ Spectrum Analyzer Frequency Range from 9 kHz up to 7.5 GHz, -165 dBm/Hz Displayed Average Noise Level (Typ.), -104 dBc/Hz.@10 kHz Offset Phase Noise (1 GHz, Typ.), 1 Hz up to 3 MHz Resolution Bandwidth (RBW), Preamplifier and independent signal source up to 7.5 GHz, GPS positioning and logging
- ◆ Cable and Antenna Test Frequency Range from 100 kHz up to 7.5 GHz, Distance To Fault and Time Domain Analysis
- ◆ Optional Vector Network Analyzer, Bias out up to 32VDC
- ◆ Optional Analog and Digital Modulation Analysis, IQ Data Acquisition, Indoor and outdoor map
- ◆ Typical working time 4 hours, 3.2 kg net weight, 8.4 Inch Multi-Touch Screen , Mouse and Keyboard supported

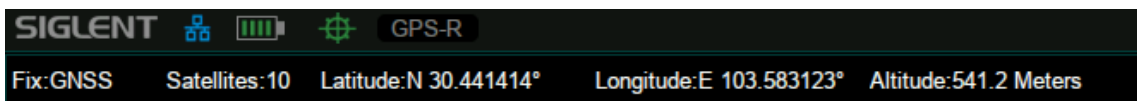
Model	SHA851A	SHA852A
Spectrum Analyzer	9 kHz~3.6 GHz	9 kHz~7.5 GHz
Cable and Antenna Test	100 kHz~3.6 GHz	100 kHz~7.5 GHz

## Design Features

### 8.4 inch multi-touch screen and full keyboard control



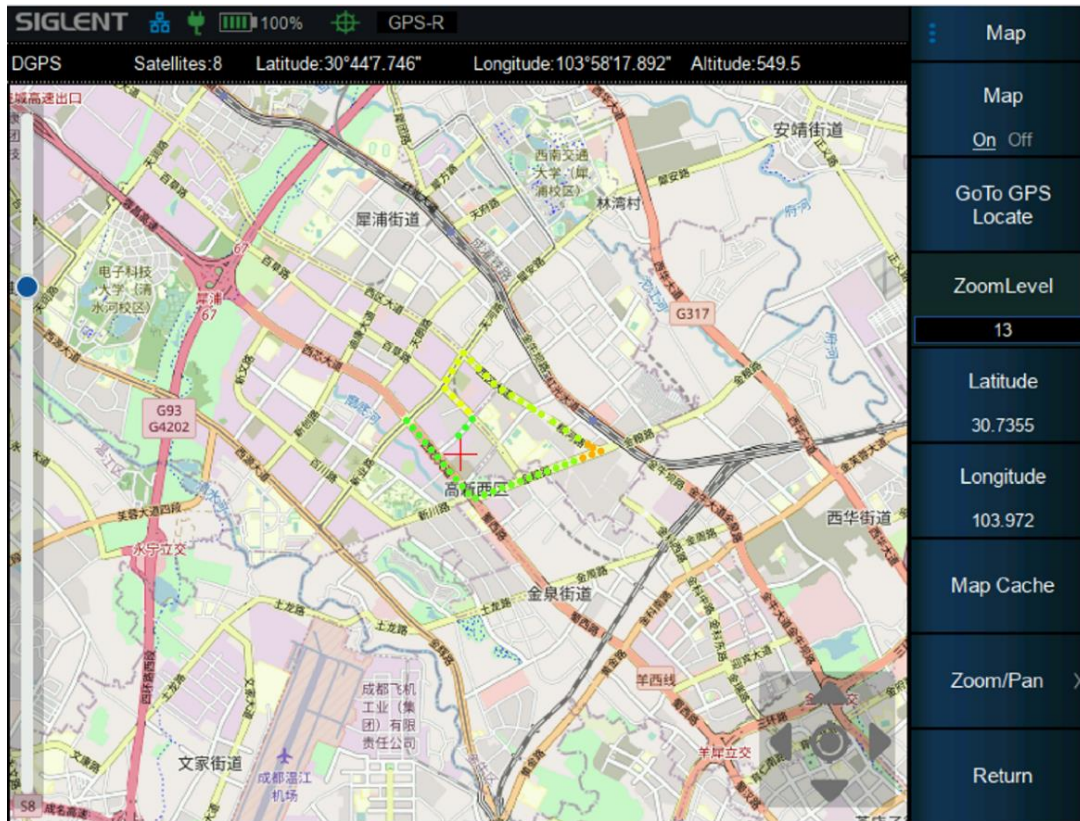
### GPS Location and trace log recorder, sync 10MHz reference clock



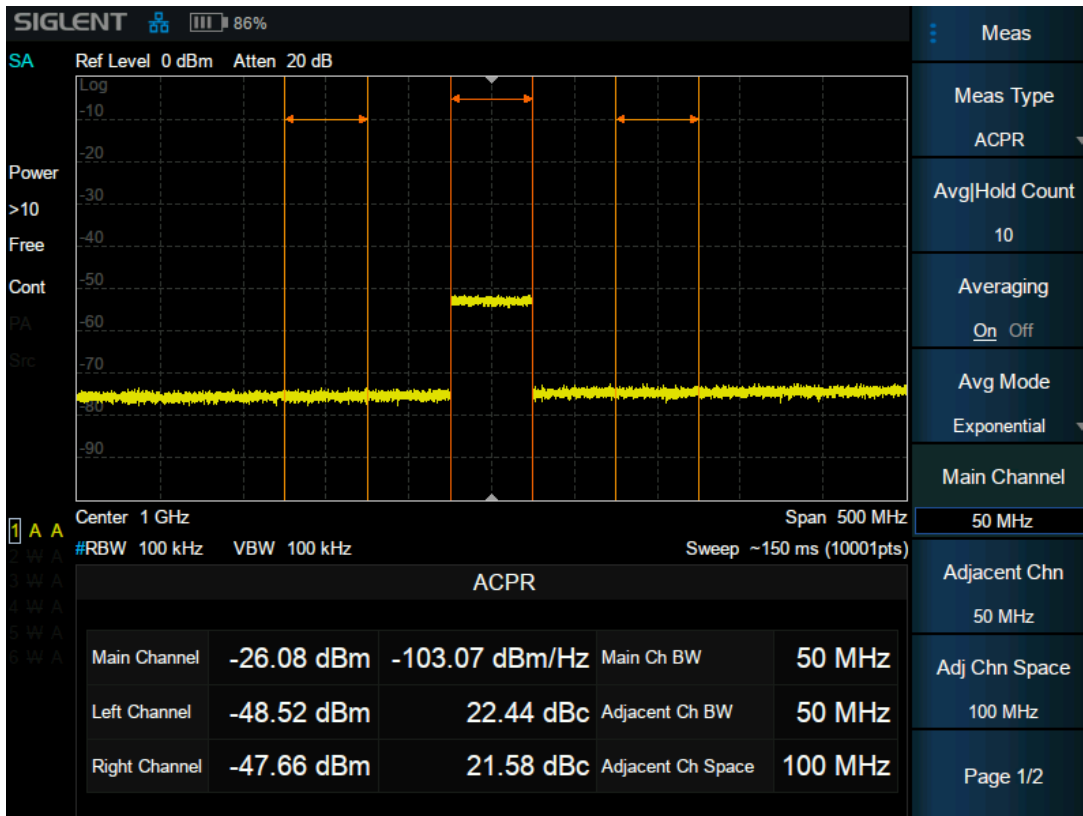
### Interference analysis with directional antenna



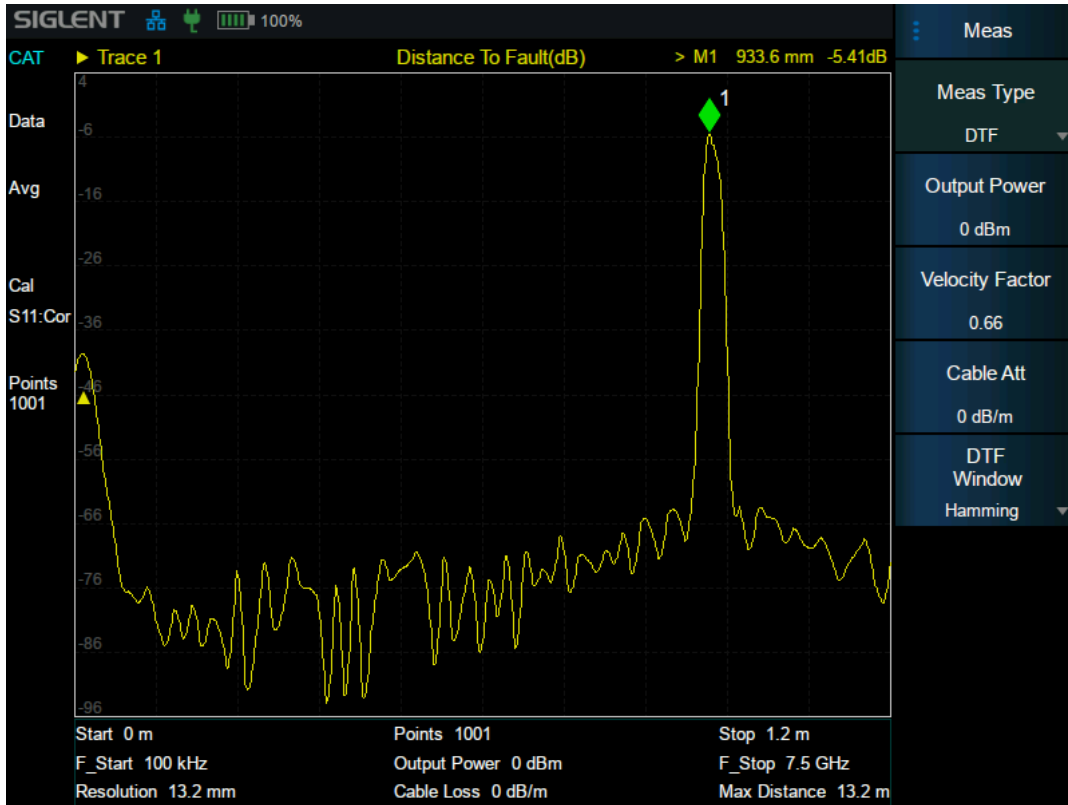
### Outdoor and Indoor map, GPS logging



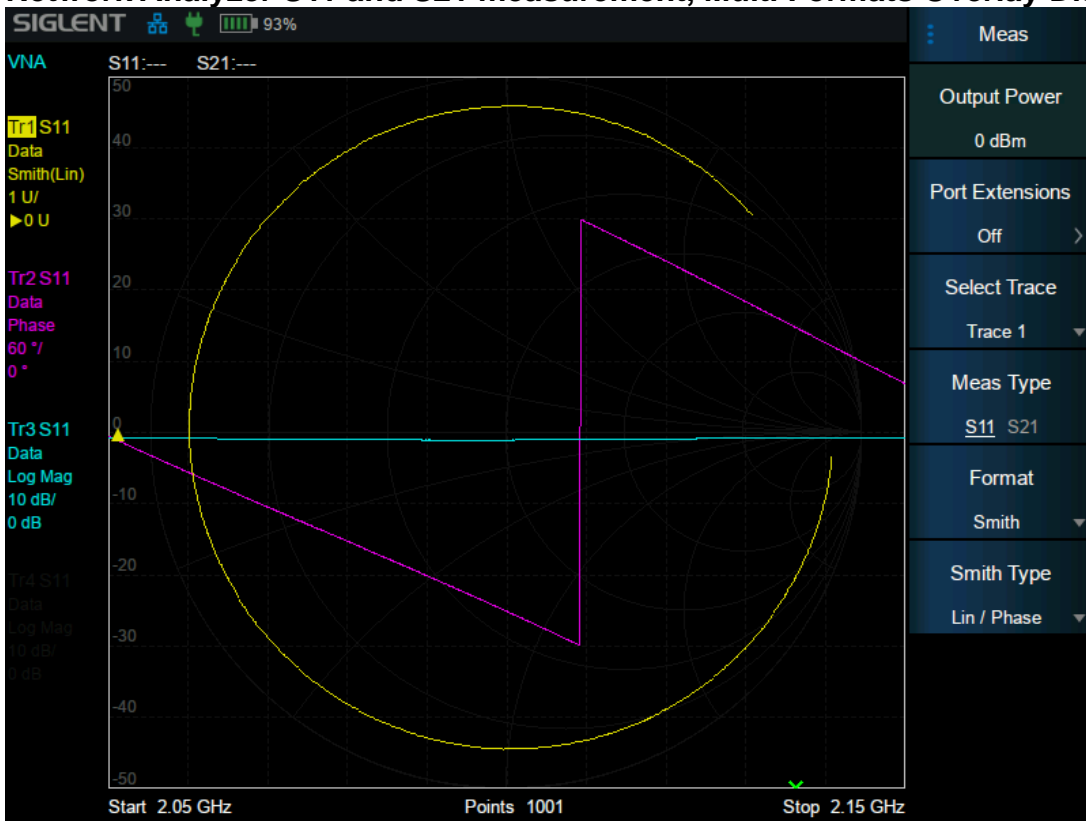
### Channel Power and ACPR measurement



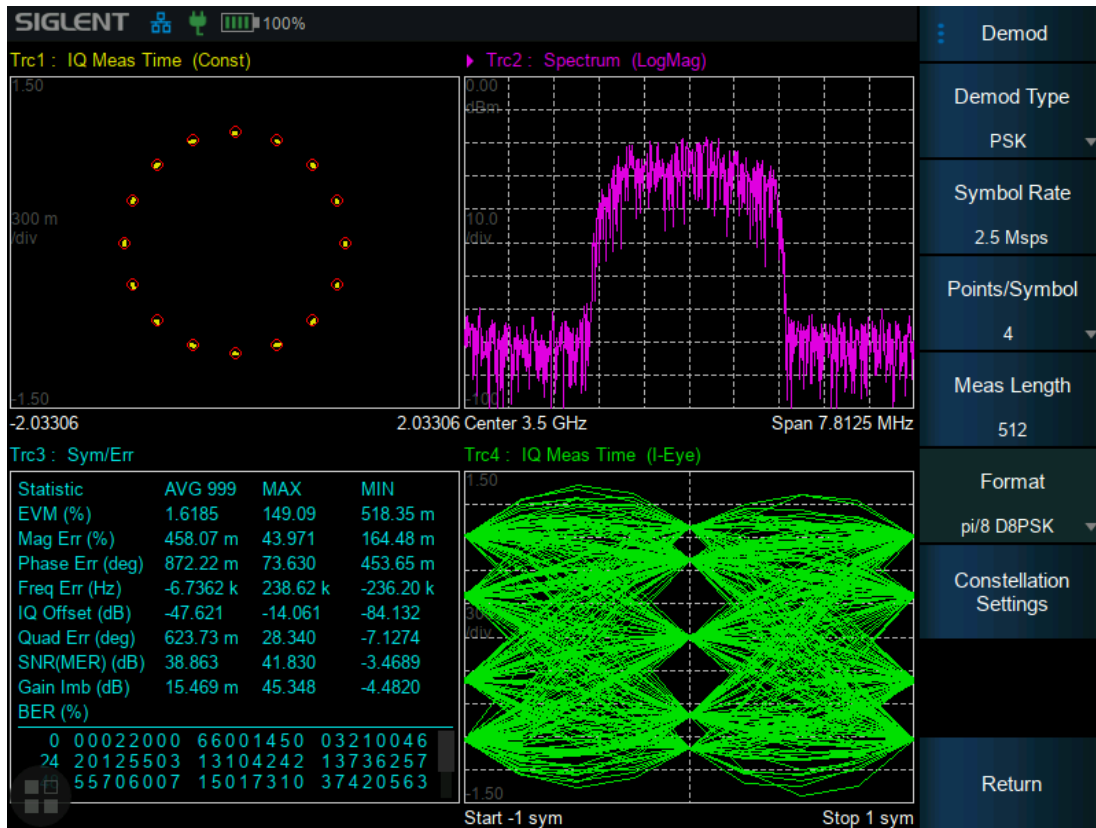
### Cable and Antenna Test based on Timing Domain Analysis



### Vector Network Analyzer S11 and S21 measurement, Multi Formats Overlay Display



## AM/FM/PM analog modulation analysis, and ASK/FSK/PSK/MSK/QAM digital modulation analysis



## Accessories

Utility Kit



Near Field Probe Set



50Ω Calibration Kit



GPS Antenna



Portable Bag



Directional Antenna Kit





## Specifications

Specifications are valid under the following conditions: The instrument is within the calibration period, has been stored between 0 and 50°C for at least 2 hours prior to use, and has been powered on and warmed up for at least 60 minutes. The specifications include the measurement uncertainty, unless otherwise noted.

**Specifications:** All products are guaranteed to meet published specifications when operating at room temperature (approximately 25°C), unless otherwise noted.

**Typical:** Performance deemed typical implies that 80 percent of the measurement results will meet the typical published performance with a 95th percentile confidence level at room temperature (approximately 25°C). Typical performance is not warranted and does not include measurement uncertainty.

**Nominal:** The expected performance or design attribute.

## Spectrum Analyzer

### Frequency and Time Characteristic

Frequency		
	SHA851A	SHA852A
Frequency range	9 kHz~3.6 GHz	9 kHz~7.5 GHz
Frequency resolution	1 Hz	
Frequency Span		
Range	0 Hz, 100 Hz to Max Frequency	
Accuracy	$\pm$ Span / (number of display points - 1)	

Internal Reference Source	
Reference frequency	10.000000 MHz
Reference frequency accuracy / uncertainty	$\pm$ [(time since last adjustment $\times$ frequency aging rate) + temperature stability + initial calibration accuracy]
Initial calibration accuracy	<1 ppm
Temperature stability	<1 ppm/year, 0 °C ~50 °C
Frequency aging rate	<0.5 ppm/first year, 3.0 ppm/20 years
Accuracy, synced to GPS	$\pm$ 0.01 ppm
Accuracy, unsynced to GPS	$\pm$ 0.4 ppm

Marker	
Marker resolution	Span / (number of display points - 1)
Marker uncertainty	$\pm$ [frequency indication $\times$ reference frequency uncertainty + 1% $\times$ span + $\frac{1}{2}$ * marker resolution + 1 Hz]
Frequency Counter resolution	0.1 Hz

Bandwidths	
Resolution bandwidth (-3dB)	1 Hz ~ 3 MHz, in 1-3-10 sequence
Resolution filter shape factor	< 4.8 : 1 (60 dB:3 dB), Gaussian-like
RBW uncertainty	<5%
Video bandwidth (-3dB)	1 Hz ~ 10 MHz, in 1-3-10 sequence
VBW uncertainty	<5%

Sweep and Trigger		
Sweep time	1 ms to 4000 s	
RBW	Sweep	3 kHz ~ 3 MHz
	FFT	1 Hz ~ 10 kHz
Sweep points	201~10001	
Sweep rule	Single, Continuous	
Trigger source	Free, Video, External, Periodic	
External trigger	5V TTL level, Rising edge/Falling edge	

### Amplitude Accuracy and Range Specifications

### Amplitude and Level

Measurement range	DANL to +10 dBm, 100 kHz ~ 1 MHz, Preamp off DANL to +20 dBm, 1 MHz ~ 7.5 GHz, Preamp off
Reference level	-200 dBm to +30 dBm, 1 dB steps
Preamplifier	25 dB (nom.)
Input attenuation	0~50 dB, 2 dB steps
Maximum input DC voltage	+/- 50 VDC
Maximum damage level	33 dBm, $f_c \geq 10$ MHz, att > 20 dBm, preamp off, in 3 minutes

### Level Display

Logarithmic level axis	1 dB to 200 dB
Linear level axis	0% to 100% (reference level)
Units of level axis	dBm, dBmV, dB $\mu$ V, dB $\mu$ A, Volt, Watt
Number of traces	6
Trace detectors	Positive-peak, Negative-peak, Sample, Normal, Average(Voltage/RMS/Video)
Trace functions	Clear write, Max Hold, Min Hold, View, Blank, Average, Math

### Field Strength Measurement

Antenna factor	4
Unit	dBm/m <sup>2</sup> , dBw/m <sup>2</sup> , dBV/m, dBmV/m, dBpV/m, V/m, W/m <sup>2</sup> , W/cm <sup>2</sup> , A/m

**Displayed Average Noise Level (DANL)**

		SHA851A	SHA852A
20 °C to 30 °C, att = 0 dB, RBW = 1 Hz, sample detector, trace average > 50, Source off			
Preamp off	100 kHz ~1 MHz	-125 dBm, -136 dBm (typ.)	-125 dBm, -136 dBm (typ.)
	1 MHz~600 MHz	-140 dBm, -147 dBm (typ.)	-140 dBm, -147 dBm (typ.)
	600 MHz~1.8 GHz	-139 dBm, -145 dBm (typ.)	-139 dBm, -145 dBm (typ.)
	1.8 GHz~3.2 GHz	-134 dBm, -140 dBm (typ.)	-134 dBm, -140 dBm (typ.)
	3.2 GHz~3.65 GHz	-136 dBm, -143 dBm (typ.)	-136 dBm, -143 dBm (typ.)
	3.65 GHz~4.1 GHz		-136 dBm, -143 dBm (typ.)
	4.1 GHz~5.0 GHz		-135 dBm, -141 dBm (typ.)
	5.0 GHz~5.85 GHz		-135 dBm, -141 dBm (typ.)
	5.85 GHz~6.7 GHz		-134 dBm, -140 dBm (typ.)
	6.7 GHz~7.5 GHz		-132 dBm, -138 dBm (typ.)
Preamp on	100 kHz ~1 MHz	-125 dBm, -137 dBm (typ.)	-125 dBm, -137 dBm (typ.)
	1 MHz~600 MHz	-156 dBm, -163 dBm (typ.)	-156 dBm, -163 dBm (typ.)
	600 MHz~1.8GHz	-159 dBm, -165 dBm (typ.)	-159 dBm, -165 dBm (typ.)
	1.8 GHz~3.2 GHz	-157 dBm, -163 dBm (typ.)	-157 dBm, -163 dBm (typ.)
	3.2 GHz~3.65 GHz	-157 dBm, -163 dBm (typ.)	-157 dBm, -163 dBm (typ.)
	3.65 GHz~4.1 GHz		-157 dBm, -163 dBm (typ.)
	4.1 GHz~5.0 GHz		-156 dBm, -162 dBm (typ.)
	5.0 GHz~5.85 GHz		-156 dBm, -162 dBm (typ.)
	5.85 GHz~6.7 GHz		-155 dBm, -161 dBm (typ.)
	6.7 GHz~7.5 GHz		-153 dBm, -159 dBm (typ.)

**SSB Phase Noise**

Offset	20 °C to 30 °C, fc = 1 GHz, Normalized to 1 Hz
10 kHz	-100 dBc/Hz, -104 dBc/Hz (typ.)
100 kHz	-100 dBc/Hz, -104 dBc/Hz (typ.)
1 MHz	-114 dBc/Hz, -117 dBc/Hz (typ.)

Frequency Response	
	20 °C to 30 °C, 30% to 70% relative humidity, att = 20 dB, relative to 50 MHz
Preamp off	±0.8 dB, ±0.4 dB (typ.)
Preamp on	±1.2 dB, ±0.6 dB (typ.)
Error and Accuracy	
Resolution bandwidth switching uncertainty	Logarithmic resolution, relative to RBW = 10 kHz ± 0.2 dB (nom.)
Input attenuation switching uncertainty	20 °C to 30 °C, fc = 50 MHz, preamp off, relative to att = 20 dB, att =0~50 dB ± 0.5 dB
Absolute amplitude accuracy	20 °C to 30 °C, fc = 50 MHz, RBW= VBW = 1 kHz, att = 20 dB, peak detector, 95% reliability ±0.4 dB, input signal -20 dBm, Preamp off ±0.5 dB, input signal -40 dBm, Preamp on
Total amplitude accuracy	20 °C to 30 °C, fc>100 kHz, input signal -50 dBm ~ 0 dBm, att = 20 dB, RBW=VBW=1 kHz, peak detector, preamp off, 95% reliability ±0.7 dB
RF input VSWR	Att = 10 dB, fc≥1 MHz 1 MHz~3.2 GHz 1.7 (nom.) 3.2GHz~7.5 GHz 1.5 (nom.)
Distortion and Spurious Responses	
Second harmonic distortion (SHI)	20 °C to 30 °C, fc ≥ 50 MHz, mixer level -20 dBm, att = 0 dB, preamp off 50 MHz~3.2 GHz -65 dBc / +45 dBm (nom.) 3.2 GHz~3.75 GHz -80 dBc / +60 dBm (nom.)
Third-order intercept (TOI)	20 °C to 30 °C, fc ≥ 50 MHz, two -20 dBm tones spaced by 100 kHz, att = 0 dB, preamp off 50 MHz~3.2 GHz +9.5 dBm (typ.) 3.2 GHz~7.5 GHz +16 dBm (typ.)
1dB gain compression	20 °C to 30 °C, fc ≥ 50 MHz, two tones frequency interval ≥ 10MHz, RBW <1 kHz, att = 0 dB, preamp off > 8 dBm (nom.)
Residual response	20 °C to 30 °C, input terminated = 50 Ω, att = 0 dB < -90 dBm
Input related spurious	20 °C to 30 °C, mixer level = -30 dBm <-65 dBc

## Source (SHA850-SOR)

### Frequency Parameter

	SHA851A	SHA852A
Frequency Range	100 kHz ~ 3.6 GHz	100 kHz ~ 7.5 GHz
Frequency resolution	1 Hz	
Source Type	CW, CW Offset	

### Power Parameter

Output level	-40 dBm ~ 0 dBm
Output level resolution	1 dB
Output flatness	±2 dB (nom.)
VSWR	< 2 (nom.)
Connector and Impedance	N-type female, 50 Ω
Average safe reverse power	Total 27 dBm (0.5 W)
Maximum safe reverse level	±50 V DC

## Advanced Measurement Kit (SHA850-AMK)

### Power Measurement

CHP, Channel Power	Channel Power, Power Spectral Density
ACPR, Adjacent Channel Power Ratio	Main CH Power, Left channel power, Right channel power
OBW, Occupied Bandwidth	Occupied Bandwidth, Transmit Frequency Error
T-Power, Time Domain Power	Zero Span Integrated Power
CNR, Carrier Noise Ratio	C/N, Noise Power

### Non-Linear Measurement

Harmonic measurement	Max Harmonic number 10
TOI, Third-Order Intercept	Measure the third-order products from two tones

### Spectrum Monitor Measurement

Spectrogram	
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## Cable and Antenna Test

Measurement		
	SHA851A	SHA852A
Frequency Range	100 kHz~3.6 GHz	100 kHz~7.5 GHz
Sweep Points	101~10001, default 1001	
Port1 Stimulus Power	-40dBm ~ 0dBm (nom.)	
Maximum Distance (meters)	(Sweep Points - 1) x Velocity Factor x Light of Speed (m/s) / (Stop Frequency - Start Frequency (Hz) )	
Resolution (meters)	Maximum Distance / Sweep Points	
Calibration	Open Response, Short Response, Response Through, Full 1-Port(OSL)	
Velocity Factor	0.1~1	
Cable Loss	-10 dB/m ~ 100 dB/m	
Trace	Mem, Math, Hold, Display	
Meas Type	DTF, Return Loss, VSWR, Cable Loss(1-Port), Insertion Loss(2-Port), TDR, DTF & TDR, DTF & Return Loss, TDR & Return Loss	
Distance to Fault(DTF)	Locate problems or faults in a length of cable or transmission line Format: Log Mag(dB), VSWR, Lin Mag Distance Unit: Meters, Feet Window Type: Rectangular, Hamming	
Time Domain Reflectometry (TDR)	Locate problems and identify the type of problem in a length of cable or transmission line. Format: Impedance(ohm), linear rho Distance Unit: as DTF Stimulus Type: Impulse, Step Frequency Type: Low-pass Window Type: Kaiser Kaiser $\beta$ : 0~13 Time Gate Type: Band Pass, Notch Time Gate Shape: Normal, Maximum, Wide, Minimum Time Gate Range: Start Distance ~ Stop Distance	
Cable Loss(1-Port)	Measure the accumulated losses throughout the length of the cable	
Insertion Loss(2-Port)	Measure the loss through a DUT or cable over a specified frequency range	

## Vector Network Analyzer (SHA850-VNA)

Stimulus and Measurement			
	SHA851A	SHA852A	
Frequency Range	100 kHz ~ 3.6 GHz	100 kHz ~ 7.5 GHz	
Measurement	S11, S21		
IFBW	100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz		
Port1 Stimulus Power	-40 dBm ~ 0 dBm (nom)		
Format	Lin Mag, Log Mag, Phase, Group Delay, SWR, Smith Chart (Lin/Phase, Log/Phase, Real/Imag, R+j*X, G+j*B), Polar Chart (Lin/Phase, Log/Phase, Real/Imag)		
Sweep Points	101~10001, default 1001		
Trace	4 traces, Mem, Math, Hold, Overlay		
Marker	(6+Ref)* 4 traces		
Calibration			
Directivity of Calibration	F504MS, Log mag, Average=50, >50MHz > 40 dB (nom.)		
Dynamic Range	S21, IFBW=10 kHz, Port1 level=0 dBm, Log Mag, Average=100		
	100 kHz ~ 1 MHz	100 dB, 108 dB (typ.)	100 dB, 108 dB (typ.)
	1 MHz ~ 1.5 GHz	108 dB, 114 dB (typ.)	108 dB, 114 dB (typ.)
	1.5 GHz ~ 3.6 GHz	106 dB, 112 dB (typ.)	106 dB, 112 dB (typ.)
	3.6 GHz ~ 6.5 GHz		102 dB, 109 dB (typ.)
	6.5 GHz ~ 7.5 GHz		100 dB, 107 dB (typ.)
Reflection trace noise (IFBW=10 kHz)	frequency	amplitude (dB rms)	phase (deg rms)
	100 kHz~3.5 GHz	0.02	0.3
Transmission trace Noise (IFBW=10 kHz)	3.5 GHz~7.5 GHz	0.03	0.5
	frequency	amplitude (dB rms)	phase (deg rms)
	100 kHz~3.5 GHz	0.015	0.18
	3.5 GHz~7.5 GHz	0.015	0.40
Calibration Type	Short Response		
	Open Response		
	Full 1-Port(OSL)		
	Response Through		
	Enhanced Response		
Port Extensions	Port 1, Port 2, Auto Open Port 1		
System Z0	50 $\Omega$		
Velocity Factor	0.1~1		



## Analog Modulation Analysis (SHA850-AMA)

Common Parameter		
	SHA851A	SHA852A
Carrier Frequency Range	2 MHz ~ 3.6 GHz	2 MHz ~ 7.5 GHz
Carrier Power Accuracy	±2 dB (nom.)	
Carrier Power Range	-30 dBm to +20 dBm (nom.)	
AM		
Modulation rate range	20 Hz to 100 kHz	
Accuracy	1 Hz (nom.)	Modulation rate < 1 kHz
	< 0.1% modulation rate (nom.)	Modulation rate ≥ 1 kHz
Modulation depth range	5% to 95%	
Accuracy	±4% (nom.)	
FM		
Modulation rate range	20 Hz to 100 kHz	
Accuracy	1 Hz (nom.)	Modulation rate < 1 kHz
	< 0.1% modulation rate (nom.)	Modulation rate ≥ 1 kHz
Frequency deviation	1 kHz to 400 kHz	
Accuracy	±4% (nom.)	
PM		
Modulation rate range	50 Hz~50 kHz	
Accuracy	1 Hz(nom.)	Modulation rate < 1 kHz
	< 0.1% modulation rate (nom.)	Modulation rate ≥ 1 kHz
Phase deviation	0.2~100 rad	
Accuracy	±4%(nom.)	

## Digital Modulation Analysis (SHA850-DMA)

Common Parameter		
	SHA851A	SHA852A
Frequency Range	2 MHz ~ 3.6 GHz	2 MHz ~ 7.5 GHz
Carrier Power Accuracy	± 2 dB (nom.)	
Carrier Power Range	-30 dBm to +20 dBm (nom.)	
Measurement		
Modulation Type	ASK: 2ASK; FSK: 2FSK, 4FSK, 8FSK, 16FSK; MSK: GMSK; PSK: BPSK, QPSK, OQPSK, 8PSK; DPSK: DBPSK, DQPSK, D8PSK, $\pi/4$ -DQPSK, $\pi/8$ -D8PSK; QAM: 16, 32, 64, 128, 256	
Meas Length	16 to 4096	
Points/Symbol	4, 6, 8, 10, 12, 14, 16	
Symbol Rate	1 ksps to 5 Msps, Symbol Rate* Points/Symbol ≤20 Msps	
Trigger Holdoff	500 ms	
Burst	Burst power sync, BERT	
Filter		
Meas/Ref Filter	Nyquist, Sqrt Nyquist, Gauss, Half Sine, Rectangular	
Length	2 to 128	
Alpha/BT	Alpha 0.01~1, BT 0.01~10	
Trace		
Trace Data	IQ Meas Time, IQ Meas Spectrum, IQ Ref Time, IQ Ref Spectrum, Time, Spectrum, IQ Mag Err, IQ Phase Err Symbol Error Chart, Err Vector Time, Err Vector Spectrum,	
Trace Formats	Log mag, Lin mag, Real, Imag, I-Q, Constellation, I-eye, Q-eye, Wrap Phase, Unwrap Phase, Trellis eye	
Symbol Error Chart		
PSK/DPSK/MSK/QAM	EVM (rms EVM, peak EVM), Magnitude error, Phase error, IQ offset, Carrier offset, SNR Quadrature error, Gain imbalance(not support for MSK)	
ASK	ASK Error, ASK depth, carrier offset	
FSK	FSK Error, Magnitude error, FSK deviation, carrier offset	

## Indoor and outdoor map (SHA850-MAP)

Measurement	
MAP Type (No built-in map)	Indoor Map: PNG or JPEG
	Outdoor Map: Google tile Format (Download from Google Maps)
MAP Level	Indoor Map: none
	Outdoor Map: Display level range 1-19
Map Data	Indoor Map: kdata recording and playback
	Outdoor Map: kml recording and playback

### GPSA Measurement

Channel Power measurement

## IQ Data Acquisition (SHA850-IQA)

Measurement	
Acquisition Setup	Acq Time、 Sample Rate、 Save(.txt)、 Storage Device(Internal/USB)
Maximum Sample Rate	20 MHz
Maximum Bandwidth	5 MHz
Data Sample Size	I=Q=2 Byte
Storage Depth	1 GB
Maximum Sample Length	250 MB(1 GB/4 Byte)
Sample Time Length	Sample Length/ Sample Rate

## Inputs and Outputs

Front Panel	
RF input, Port 2	N-type female, 50 $\Omega$ (nom.)
Source, Port 1	N-type female, 50 $\Omega$ (nom.)
USB Host	USB-A plug, version 2.0
Ear Phone Jack	3.5 mm
USB Device	USB-C plug, version 2.0
LAN	LAN (VXI 11), 10/100 Base,RJ-45
GPS Antenna (SHA850-GPS)	SMA(F), 3.3 V, 50 $\Omega$
Bias out (SHA850-BIAS)	SMB(F), 12 V-32 V, 0.1 V step
10 MHz reference input	10 MHz, -5 to +10 dBm, BNC-type female, 50 $\Omega$ (nom.)
External trigger input	1 K $\Omega$ , 5V TTL level, BNC-type female
Remote Control	
Communication Interface	LAN, USB-TMC,GPIB (USB-GPIB adaptor)
Remote Control Capability	SCPI / Labview / IVI based on USB-TMC / VXI-11 / GPIB / Socket / Telnet NI-MAX Web Browser (HTML 5 Supported)

## General Specification

<b>Structure</b>	
Dimensions	310 mm x 215 mm x 78.5 mm (WxHxD)
Weight	Net: 3.20 kg (7.0 lb)
Display	TFT LCD, 800 x 600, 8.4 inch multi-touch screen
Storage	Internal (Flash) 3.2 GByte, external (USB storage device) 32 GByte

<b>Working Environment</b>	
Source	AC voltage range: 100-240 V, 50/60 Hz or 100-120 V, 400 Hz;
Power consumption	20 W (typ.)
Temperature	Working temperature: 0 °C to 50 °C Working while charging temperature: 0 °C to 45 °C Storage temperature: -20 °C to 70 °C
Humidity	0 °C to 30 °C, ≤ 95% Relative humidity 30 °C to 50 °C, ≤ 75% Relative humidity
Altitude	Operating: less than 3 km (10000 feet)
Calibration cycle	1 year

<b>Electromagnetic Compatibility</b>	
EN 61326-1: 2013 / EN 61000-3-2: 2014	Class A (The active input power of the EUT is less than 75 W. According to EN 61000-3-2, no limits are necessary.)
EN 61000-3-3: 2013	Plt: 0.65 Pst: 1.00, dmax: 4.00 % dc: 3.00 % dt Lim: 3.30 % dt>Lim: 500ms

<b>Safety</b>	
CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11	
CAN/CSA-C22.2 No. 61010-2-030:2018	
UL 61010-1:2012/R:2018-11	
UL 61010-2-030:2018	

<b>RoHS</b>	
2011/65/EU	

## Ordering Information

Product	Description	Order Number
Product Code	Spectrum Analyzer 9 kHz~3.6 GHz, Cable and Antenna Test 100 kHz~3.6 GHz	SHA851A
	Spectrum Analyzer 9 kHz~7.5 GHz, Cable and Antenna Test 100 kHz~7.5 GHz	SHA852A
Standard Accessories	Quick Start, USB type-C cable, Power cord, AC-DC adapter, Rechargeable lithium battery, Portable bag	
Options	SHA851A to SHA852A	SHA850-F2
	Source	SHA850-SOR
	Vector Network Analysis	SHA850-VNA
	Advanced Measurement Kit	SHA850-AMK
	Analog Modulation Analysis	SHA850-AMA
	Digital Modulation Analysis	SHA850-DMA
	IQ Data Acquisition	SHA850-IQA
	DC Bias Out	SHA850-BIAS
	GPS Receiver	SHA850-GPS
	Indoor and outdoor map	SHA850-MAP
General Accessories	Rechargeable lithium battery	10V8_BAT
	AC-DC adapter	12V_AP_4A
	Portable bag	BAG_H2
	GPS antenna, SMA(M), 1000 mm	ANT-GPS1
	Directional Antenna Suit: Wideband Antennas (10 MHz~200 MHz, 200 MHz~500 MHz, 500 MHz~8 GHz), Amplifier (10 dB, 9 kHz~8 GHz)	ANT-DA1
	Near field probe kit: H-field probes (20 mm, 10 mm, 5 mm), E-field probe (5 mm), 300 kHz~3 GHz	SRF5030T
	Utility Kit: N(M)-SMA(M) cable (6 GHz), N(M)-N(M) cable (6 GHz), N(M)-BNC(F) adapter x2, N(M)-SMA(F) adapter x2, 10dB 1W attenuator	UKitSSA3X
	N(M)-BNC(M) cable, DC~2 GHz, 700 mm	N-BNC-2L
	N(M)-SMA(M) cable, DC~6 GHz, 700 mm	N-SMA-6L
	N(M)-N(M) cable, DC~6 GHz, 700 mm	N-N-6L
	N(M)-N(M) cable, DC~18 GHz, 1000 mm	N-N-18L
	N(M)-SMA(M) cable, DC~18 GHz, 1000 mm	N-SMA-18L
	SMA(M)-SMA(M) cable, DC~18 GHz, 1000 mm	SMA-SMA-18L
	N type Integrated Precision Calibration Kit, Male, DC~9 GHz, 50 Ω	Y504MS
	N type Integrated Precision Calibration Kit, Female, DC~9 GHz, 50 Ω	Y504FS
N type Precision Calibration Kit, DC~9 GHz, 50 Ω	F504TS	
3.5mm type Precision Calibration Kit, DC~9 GHz, 50 Ω	F604TS	
N type Economic Calibration Kit, DC~4.5 GHz, 50 Ω	F503ME	
N type Economic Calibration Kit, DC~4.5 GHz, 50 Ω	F503FE	
3.5mm type Economic Calibration Kit, DC~4.5 GHz, 50 Ω	F603ME	
3.5mm type Economic Calibration Kit, DC~4.5 GHz, 50 Ω	F603FE	
N type Standard Calibration Kit, DC~9 GHz, 50 Ω	F504MS	
CAT&VNA Accessories		

Product	Description	Order Number
	N type Standard Calibration Kit, DC~9 GHz, 50 Ω	F504FS
	3.5mm type Standard Calibration Kit, DC~9 GHz, 50 Ω	F604MS
	3.5mm type Standard Calibration Kit, DC~9 GHz, 50 Ω	F604FS

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

### Headquarters:

SIGLENT Technologies Co., Ltd  
Add: Bldg No.4 & No.5, Antongda Industrial  
Zone, 3rd Liuxian Road, Bao'an District,  
Shenzhen, 518101, China  
Tel: + 86 755 3688 7876  
Fax: + 86 755 3359 1582  
Email: sales@siglent.com  
Website: int.siglent.com

### USA:

SIGLENT Technologies America, Inc  
6557 Cochran Rd Solon, Ohio 44139  
Tel: 440-398-5800  
Toll Free: 877-515-5551  
Fax: 440-399-1211  
Email: info@siglent.com  
Website: www.siglentna.com

### Europe:

SIGLENT Technologies Germany GmbH  
Add: Staetzlinger Str. 70  
86165 Augsburg, Germany  
Tel: +49(0)-821-666 0 111 0  
Fax: +49(0)-821-666 0 111 22  
Email: info-eu@siglent.com  
Website: www.siglenteu.com

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