



HSA1000 Series

Handheld Spectrum Analyzer

- Frequency range 9 kHz to 1.6GHz/3.6GHz/7.5GHz
- -160 dBm DANL (Displayed Average Noise Level)
- Phase Noise < -106 dBc/Hz @1GHz at 10 kHz offset
- 1Hz Minimum Resolution Bandwidth (RBW)
- Total Amplitude Accuracy <0.7 dB
- Provide EMI pre-compliance test function, optional EMC test software
- Standard Pass/Fail on-site test alert ability
- Li-ion battery, operating life up to 4 - 6 hours, easy replacement, you can purchase extra batteries for longer test time.
- Optional 1.6GHz/3.6GHz/7.5GHz tracking generator
- Standard GPS receiver, optional antenna, the latitude/longitude information and test information can be recorded
- 8-inch (1024*768) IPS LCD touchscreen, wider viewing angle, built-in light sensor to adjust the screen backlight according to the environmental light.



LCD display



IPS



multi-touch



up to
six hours



auto dimming



optional bag

Built-in light sensor to adjust the screen backlight according to the environmental light.

8-inch (1024*768) IPS LCD screen, wider viewing angle, full touch design for more convenient operation

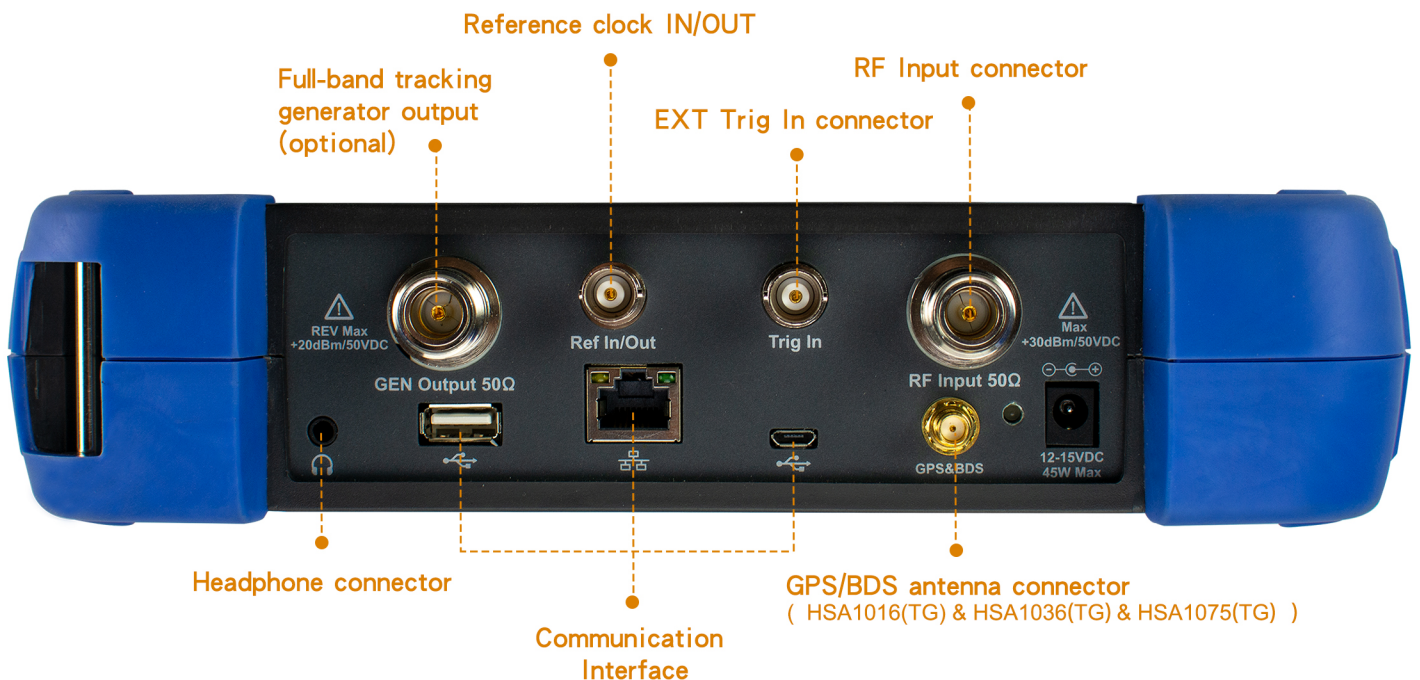
Preset key, resets the analyzer to a known state.



Silicone non-slip to protect the instrument

Adjustable handle strap to prevent the instrument from falling off.

2.5 kg (with battery) for easy carrying



Reference clock IN/OUT

Full-band tracking generator output (optional)

RF Input connector

EXT Trig In connector

Headphone connector

Communication Interface

GPS/BDS antenna connector
(HSA1016(TG) & HSA1036(TG) & HSA1075(TG))

More convenient and efficient for field testing

8-inch IPS LCD, wider viewing angle, built-in light sensor to adjust the screen backlight according to the environmental light, provides a superior, bright and clear trace for indoor and outdoor use. There is no need to operate in the shade.



Excellent power management function

Battery operating life up to 4 - 6 hours, you can purchase extra batteries for longer test time, easy battery replacement.



Polymer lithium-ion battery
Model: HSA
Battery Capacity: 9100mAh 7.4V
Nominal Voltage: 7.4V
Limit Charge Voltage: 8.4V
Executive Standard: GB/T 18287-2013

Attention:
1. Use the special-purpose battery charger to charge.
2. Do not put the battery in an area with high temperature.
3. Prevent the battery from short-circuiting.
4. Please reference the user instructions.
5. See related instructions.

Warning: It is danger to put the battery into the fire or with sharp objects.

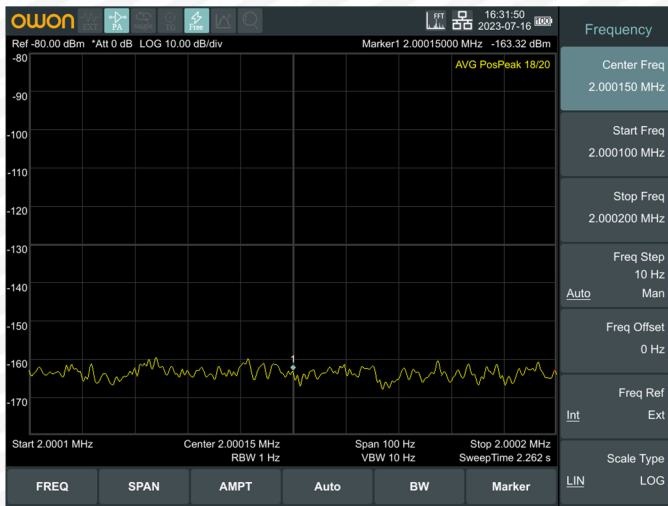


Owon
Created by Liliang

Voltage	12 - 15 VDC
Max. Power	45W
Battery	7.4V 9100mAh

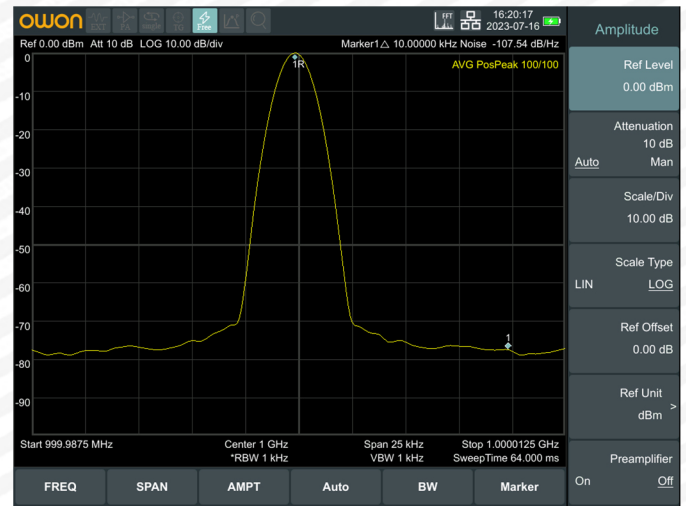
Made in China
www.owon.com.cn

Excellent small signal measurement capability



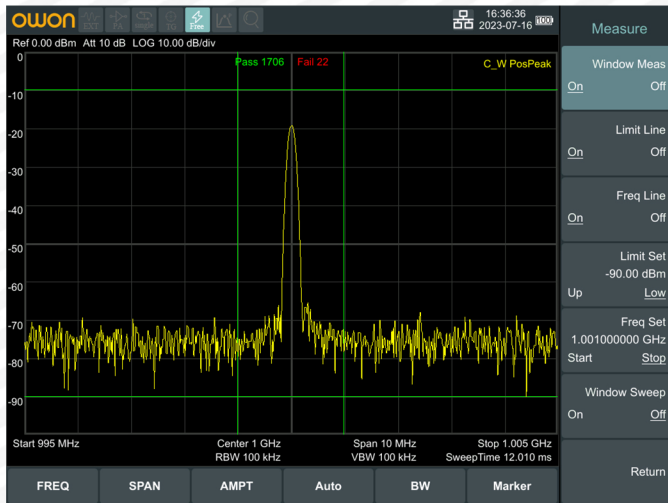
-160 dBm DANL (Displayed Average Noise Level), can observe weaker small signals

More accurate low-noise measurements



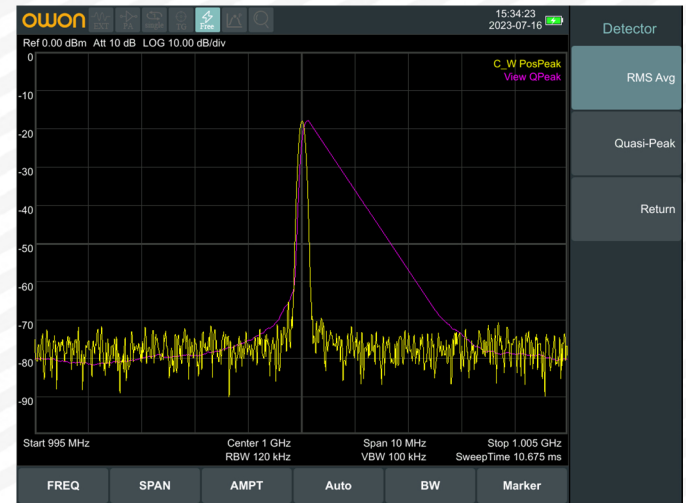
Phase Noise < -80 dBc/Hz @1GHz at 10 kHz offset

Pass/Fail function



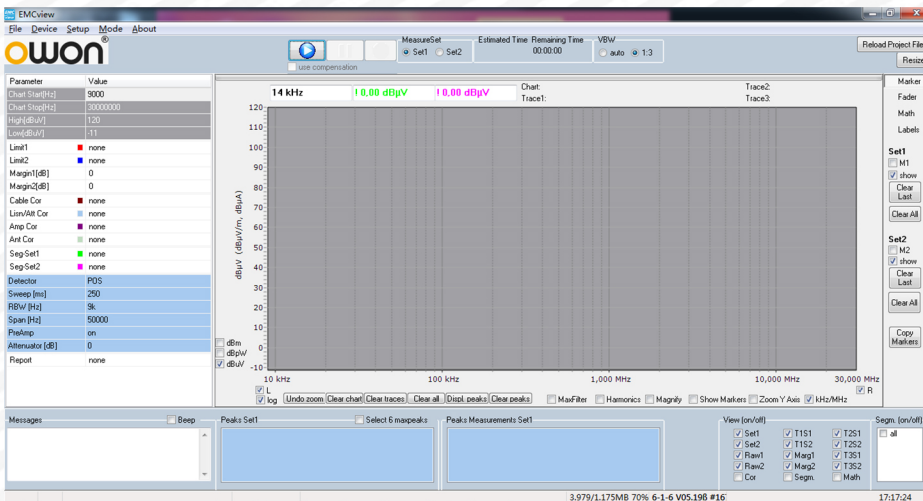
Quickly determine if the test results pass

Provides EMI pre-compliance test function



Equipped with EMI filter (6dB) and peak detector as standard, it is more accurate for EMI pre-test and diagnosis, and complete testing and production report can be completed by using supporting software.

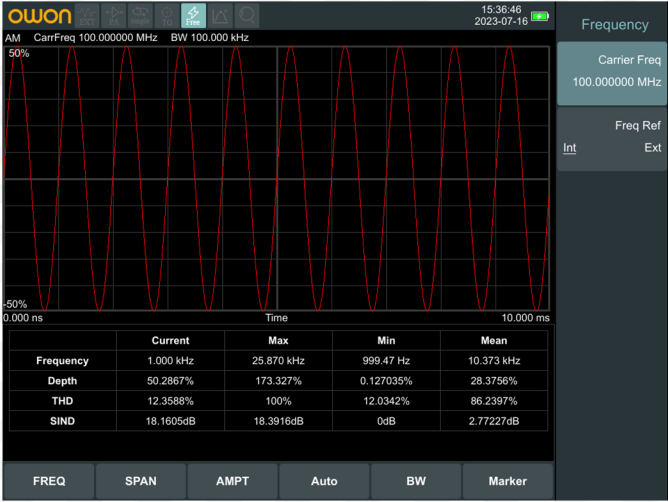
Provide EMC test function on PC (requires optional software)



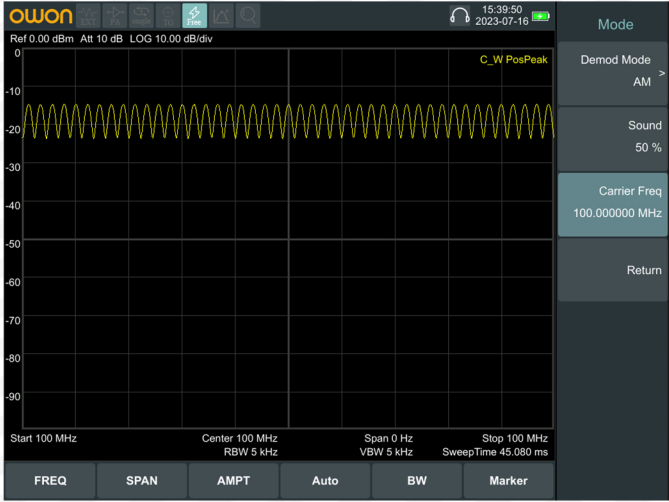
Built-in more than 200 mainstream EMC test standards and regulations templates. The user selects the corresponding template, and the software automatically sets the spectrum analyzer and records the test data. The data and regulations can be compared on the same screen. Users can also customize regulations for comparative analysis.

Provide multiple extended function modes

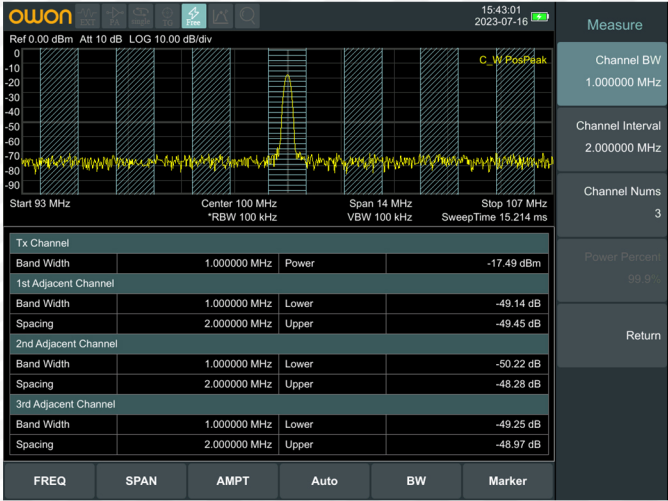
Standard modulation signal quality analysis, audio demodulation, field strength measurement, channel measurement and frequency counter, ect. multiple general and extended test functions.



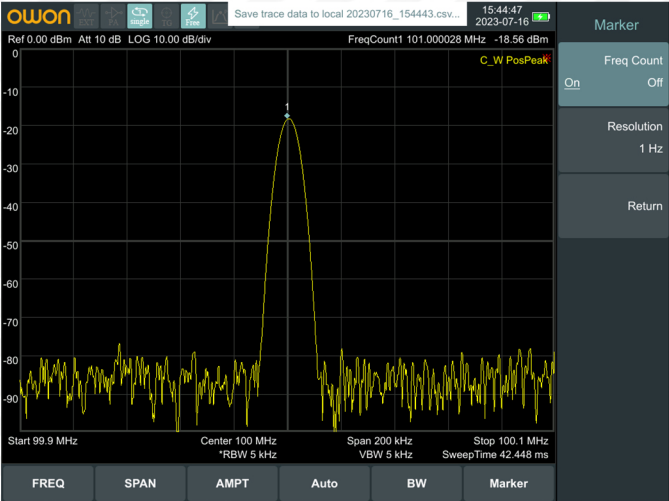
modulation signal quality analysis



audio demodulation

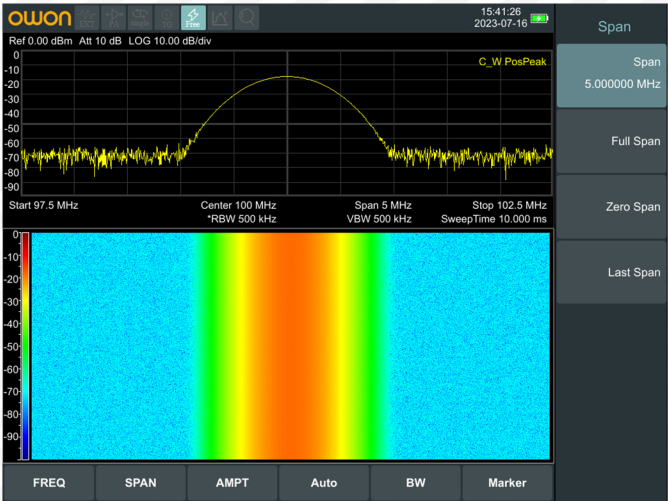


channel measurement



frequency counter

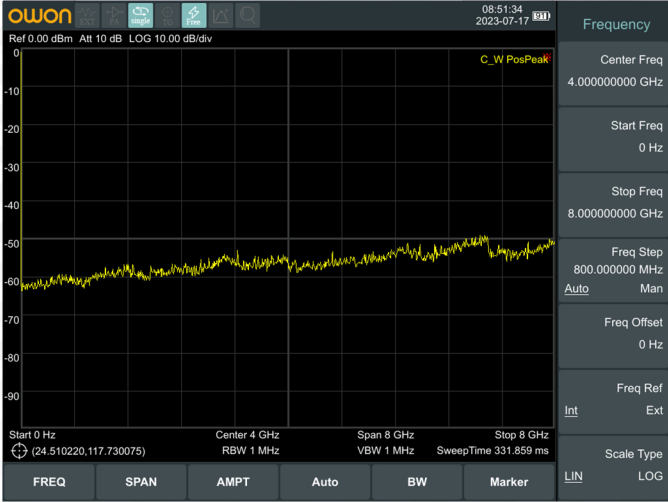
Waterfall plot graphic



View the behavior of varying signal parameters over time, track the frequency and power behavior over the time, particularly intermittent signals. The user can use waterfall plot graphic to analyze the stability of a signal over the time, or to identify intermittent interference signals in communications systems.

Provide GPS positioning function

Standard GPS antenna connector, optional OWON GPS antenna, the latitude/longitude information and measurement data can be saved as CSV file.



	1	2	3	4	5	6	7	8	9	10	11
1	No	Freq(Hz)	Ampt_Trac	Ampt_Trac	Ampt_Trac	Ampt_Trac	Ampt_Trac	Loc			
2	1	9000	2.32	0	0	0	0	(26.0586 119.299)			
3	2	6009000	-48.54	0	0	0	0	(26.0586 119.299)			
4	3	12009000	-47.46	0	0	0	0	(26.0586 119.299)			
5	4	18009000	-47.68	0	0	0	0	(26.0586 119.299)			
6	5	24009000	-47.05	0	0	0	0	(26.0586 119.299)			
7	6	30009000	-47.33	0	0	0	0	(26.0586 119.299)			
8	7	36009000	-46.13	0	0	0	0	(26.0586 119.299)			
9	8	42009000	-47.44	0	0	0	0	(26.0586 119.299)			
10	9	48009000	-47.27	0	0	0	0	(26.0586 119.299)			
11	10	54009000	-47.52	0	0	0	0	(26.0586 119.299)			
12	11	60009000	-48.3	0	0	0	0	(26.0586 119.299)			
13	12	66009000	-48.12	0	0	0	0	(26.0586 119.299)			
14	13	72009000	-47.11	0	0	0	0	(26.0586 119.299)			
15	14	78009000	-47.55	0	0	0	0	(26.0586 119.299)			
16	15	84009000	-48.26	0	0	0	0	(26.0586 119.299)			
17	16	90009000	-46.82	0	0	0	0	(26.0586 119.299)			
18	17	96009000	-48.97	0	0	0	0	(26.0586 119.299)			
19	18	102009000	-47.66	0	0	0	0	(26.0586 119.299)			
20	19	108009000	-47.94	0	0	0	0	(26.0586 119.299)			
21	20	114009000	-47.13	0	0	0	0	(26.0586 119.299)			
22	21	120009000	-46.58	0	0	0	0	(26.0586 119.299)			
23	22	126009000	-47.78	0	0	0	0	(26.0586 119.299)			
24	23	132009000	-46.83	0	0	0	0	(26.0586 119.299)			
25	24	138009000	-46.76	0	0	0	0	(26.0586 119.299)			
26	25	144009000	-46.19	0	0	0	0	(26.0586 119.299)			
27	26	150009000	-48.18	0	0	0	0	(26.0586 119.299)			
28	27	156009000	-47.52	0	0	0	0	(26.0586 119.299)			
29	28	162009000	-48.05	0	0	0	0	(26.0586 119.299)			
30	29	168009000	-48.83	0	0	0	0	(26.0586 119.299)			
31	30	174009000	-47.63	0	0	0	0	(26.0586 119.299)			
32	31	180009000	-47.99	0	0	0	0	(26.0586 119.299)			
33	32	186009000	-48.13	0	0	0	0	(26.0586 119.299)			



- | | | | |
|------------------------------|--------------|---------------|--|
| ① Handheld Spectrum Analyzer | ② Metal Case | ③ Quick Guide | ④ CD Rom |
| ⑤ Power Cord | ⑥ Adapter | ⑦ USB Cable | ⑧ Beidou + GPS antenna
(HSA1016(TG) & HSA1036(TG)
& HSA1075(TG)) |
| ⑨ Stand Holder | | | |

Device dimension: (W/H/D 265 x 190 x 58 mm)

Product specifications: The net weight is about 2.5kg, the gross weight is about 5.1kg.

HSA1000 Series Handheld Spectrum Analyzer Specifications

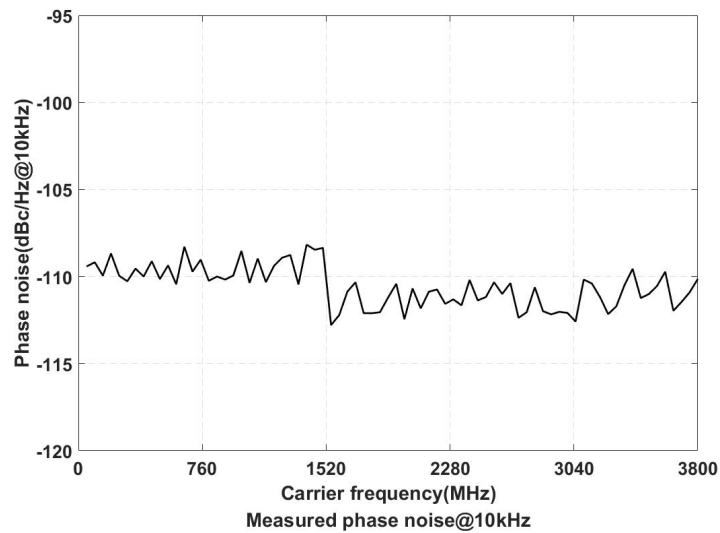
This chapter lists the technical specifications and general technical specifications of the spectrum analyzer. Unless otherwise stated, the technical specifications apply to the following conditions:

- The instrument has been preheated for 30 minutes before use.
- The instrument is in the calibration cycle and has been self-calibrated.

"Typical" and "nominal" for this product are defined as follows

- Typical: Refers to the performance of the product under certain conditions.
- Nominal: Refers to the approximate value under product application process.

Frequency		
Frequency Range	HSA1016 (TG)	9.000 kHz to 1.600000000 GHz
	HSA1036 (TG)	9.000 kHz to 3.600000000 GHz
	HSA1075 (TG)	9.000 kHz to 7.500000000 GHz
Frequency Resolution	1 Hz	
Internal Reference Frequency		
Reference Frequency	10 MHz	
Reference Frequency Accuracy	±[(days since last calibrate × freq aging rate) + temperature stability + initial accuracy]	
Initial calibration accuracy	<1 ppm	
Temperature stability	0℃ to 50℃ , reference to 25℃ < 0.5 ppm	
Aging rate	<1 ppm/year	
Frequency Readout Accuracy		
Marker frequency resolution	span / (number of sweep points - 1)	
Marker frequency uncertainty	±(frequency indication × reference frequency accuracy + 1% × span + 10% × resolution bandwidth + marker frequency resolution)	
Frequency Counter		
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
Uncertainty	±(frequency indication × reference frequency accuracy + counter resolution)	
Frequency Span		
Range	0 Hz, 100 Hz to maximum frequency of instrument	
Uncertainty	± span / (number of sweep points - 1)	
SSB Phase Noise (20℃ to 30℃ ,fc=1 GHz)		
Carrier Offset	10 kHz	< -106 dBc/Hz (typical)
	100 kHz	< -104 dBc/Hz (typical)
	1 MHz	< -115dBc/Hz (typical)



Residual FM (20°C to 30°C, RBW = VBW = 1 kHz)

Residual FM < 50 Hz (nominal)

Bandwidth

Resolution Bandwidth(-3dB) 1 Hz to 1 MHz (1-3-5-10 steps by sequence)

RBW accuracy < 5%, typical

Resolution Filter Shape Factor (60 dB : 3 dB) < 5 typical

Video Bandwidth (-3 dB) 10 Hz to 3 MHz(1-3-5-10 steps by sequence)

Resolution bandwidth (-6 dB) (EMI) 200 Hz, 9 kHz, 120 kHz, 1 MHz

Amplitude

Amplitude measurement range

HSA1016 (TG)

DANL to +10 dBm, 100 kHz to 10MHz,
Preamp Off
DANL to +20 dBm, 10 MHz to 1.6 GHz,
Preamp Off

HSA1036 (TG)

DANL to +10 dBm, 100 kHz to 10MHz,
Preamp Off
DANL to +20 dBm, 10 MHz to 3.6 GHz,
Preamp Off

HSA1075 (TG)

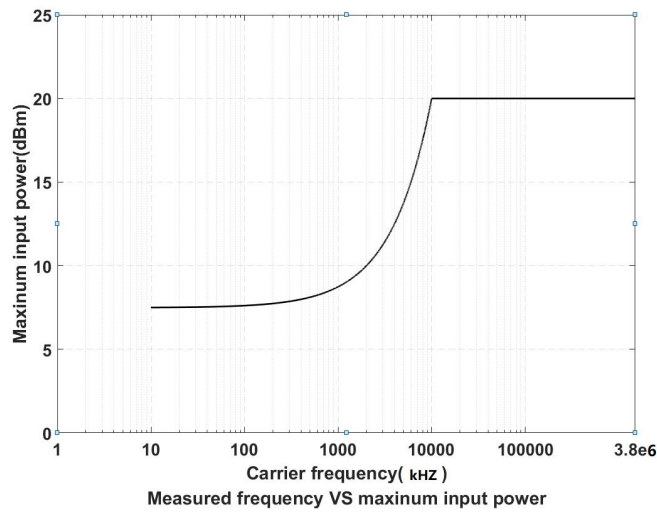
DANL to +10 dBm, 100 kHz to 10MHz,
Preamp Off
DANL to +20 dBm, 10 MHz to 7.5 GHz,
Preamp Off

Max Input Level

Input DC Voltage 50 V

Continuous power Attenuator =40dB
+20dBm (100 mW)

Max. damage level +30 dBm (1 W)



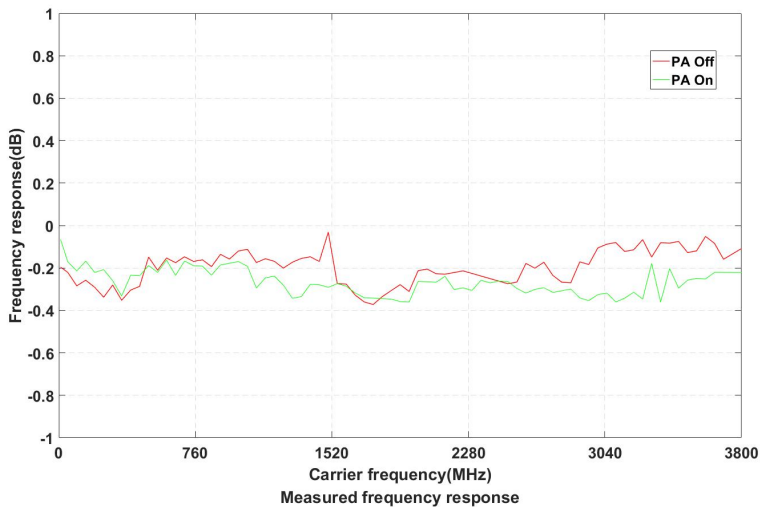
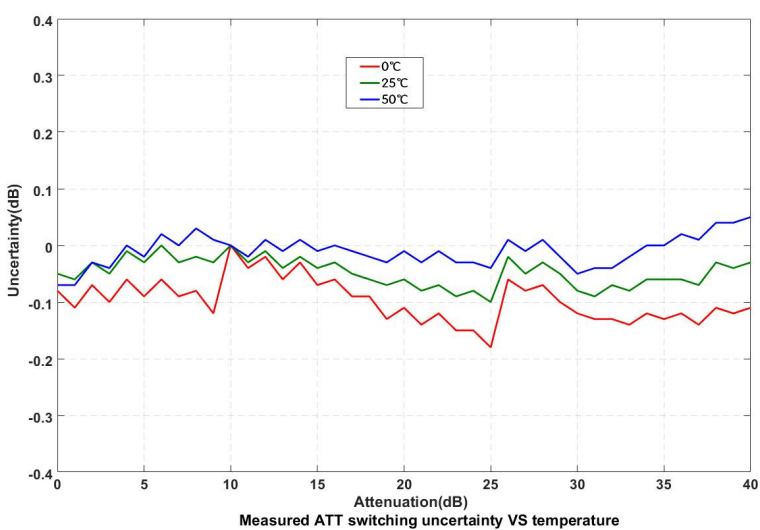
Display Average Noise Level

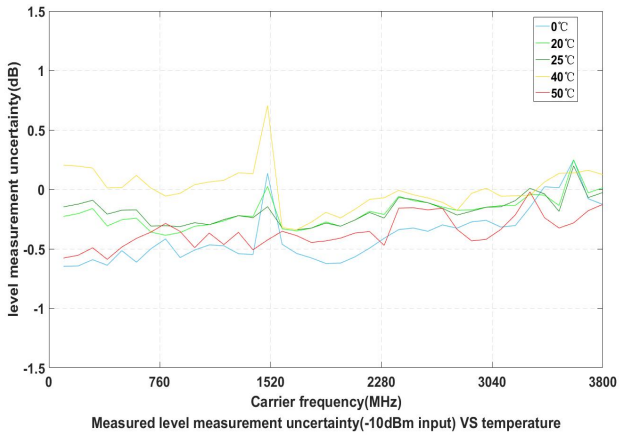
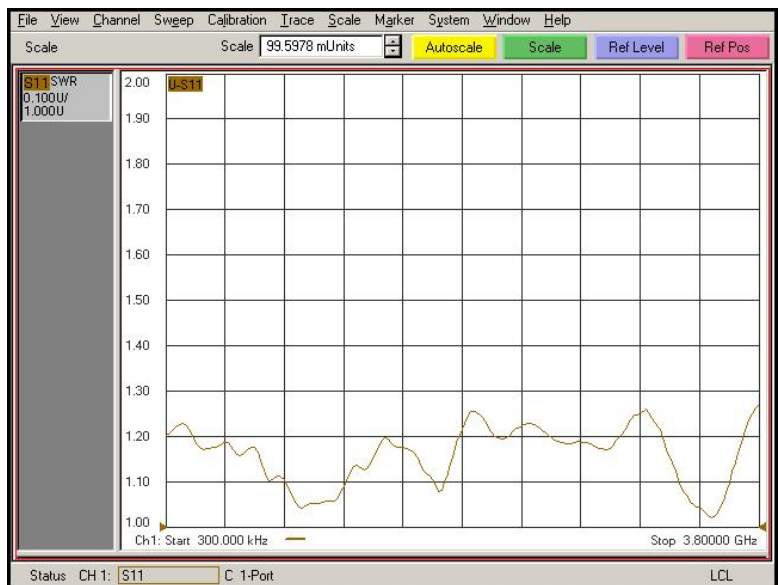
(attenuation = 0 dB, RBW = VBW = 100 Hz, sample detector, trace average ≥ 50 , 20°C to 30°C, input impedance = 50 Ω)

Preamplifier Off	HSA1016 (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130dBm
		500 MHz to 1.6 GHz	-138 dBm (Typical), <-128dBm
	HSA1036 (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130dBm
		500 MHz to 3.6 GHz	-138 dBm (Typical), <-128dBm
	HSA1075 (TG)	9 kHz to 1 MHz	-95 dBm (Typical), <-88 dBm
		1 MHz to 500 MHz	-140 dBm (Typical), <-130dBm
		500 MHz to 3.6 GHz	-138 dBm (Typical), <-128dBm
		3.6 GHz to 6 GHz	-134 dBm (Typical), <-124dBm
		6 GHz to 7.5 GHz	-129 dBm (Typical), <-119dBm
Preamplifier On	HSA1016 (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150 dBm
		500 MHz to 1.6 GHz	-158 dBm (Typical), <-148 dBm
	HSA1036 (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150 dBm
		500 MHz to 3.6 GHz	-158 dBm (Typical), <-148 dBm
	HSA1075 (TG)	100 kHz to 1 MHz	-135 dBm (Typical), <-128 dBm
		1 MHz to 500 MHz	-160 dBm (Typical), <-150 dBm
		500 MHz to 3.6 GHz	-158 dBm (Typical), <-148 dBm
		3.6 GHz to 6 GHz	-154 dBm (Typical), <-144 dBm
		6 GHz to 7.5 GHz	-149 dBm (Typical), <-139 dBm

Level Display

Logarithmic level axis	0.01 dB to 1000 dB
Linear level axis	0 to reference level
Number of display points	801
Number of traces	8
Trace detectors	positive-peak, negative-peak, normal, sample, RMS, voltage average
	quasi-peak
Trace functions	clear write, max hold, min hold, average, view, blank, trace math

Units of level axis		dBm, dBμW, dBμA, dBmV, dBμV, W, V
Frequency response (20℃ to 30℃, input attenuation=10 dB, reference frequency=50 MHz)		
Preamp Off (fc≥9kHz)		±0.7 dB
Preamp On (fc≥100kHz)		±1.0 dB
 Frequency response(dB) Carrier frequency(MHz) Measured frequency response		
Input Attenuation Switching Uncertainty		
Setting range		0 dB to 40 dB, in 1 dB step
Switching uncertainty		fc = 50 MHz, relative to 10 dB, 20℃ to 30℃
		<0.5 dB
 Uncertainty(dB) Attenuation(dB) Measured ATT switching uncertainty VS temperature		
Absolute Amplitude Uncertainty		
Uncertainty		fc = 50 MHz, peak detector, preamplifier off, attenuation = 10 dB, input signal level = -10dBm, 20℃ to 30℃
		<0.4 dB
RBW Switching Uncertainty		
Uncertainty		relative to 10 kHz RBW
		<0.1 dB
Reference Level		
Range		-80 dBm to +30 dBm, in 1 dB step
Resolution	log scale	0.01 dB
	linear scale	4 digits
Preamplifier input signal range 0 dBm to -50 dBm		

Gain	HSA1016 (TG)	100 kHz to 1.6 GHz	20 dB (nominal)
	HSA1036 (TG)	100 kHz to 3.6 GHz	
	HSA1075 (TG)	100 kHz to 7.5 GHz	
Level Measurement Uncertainty (95% confidence level, S/N > 20 dB, RBW = VBW = 1 kHz, preamplifier off, attenuation = 10 dB, -50 dBm < input level ≤ 0 dBm, fc > 10 MHz, 20℃ to 30℃)			
Level Measurement Uncertainty		<0.7 dB	
 Measured level measurement uncertainty(-10dBm input) VS temperature			
RF Input VSWR (attenuation ≥ 10 dB)			
VSWR	HSA1016 (TG)	300 kHz to 1.6 GHz	<1.8 (nominal)
	HSA1036 (TG)	300 kHz to 3.6 GHz	
	HSA1075 (TG)	300 kHz to 7.5 GHz	
			
Distortion			
Second harmonic distortion		fc ≥ 50 MHz, Preamp off, signal input -20 dBm, attenuation = 10 dB	
		> +45 dBm	
Third-order intermodulation		fc ≥ 50 MHz, two -20 dBm tones at input mixer spaced by 200 kHz, attenuation = 0 dB	
		> +14 dBm	
1 dB Gain Compression			
1dB compression of input mixer		fc ≥ 50 MHz, 0 dB RF attenuation	

(P1dB)		>-2 dBm, nominal	
Spurious Response			
Residual response	connect 50 Ω load at input port, 0 dB input attenuation, 20°C to 30°C		
	<-90 dBm, typical		
Intermediate frequency	< -60 dBm		
System related sidebands	referenced to local oscillators, referenced to A/D conversion, referenced to subharmonic of first LO, referenced to harmonic of first LO		
	< -60 dBc		
Input related spurious	-30 dBm signal at input mixer		
	<-80 dBm		
Sweep			
Sweep Time	Span $\geq$ 10 Hz	10 ms to 3000 s	
	Zero Span	33.33 us to 3000 s	
Sweep time uncertainty	span $\geq$ 100 Hz: 5% (nominal) zero span (sweep time setting value > 1 ms): 5% (nominal)		
Sweep Mode	Continuous, Single		
Trigger			
Trigger source	free run, video, external		
External trigger level	5 V TTL level		
Tracking Generator (Option)			
Tracking Generator Output			
Frequency Range	HSA1016 (TG)	100 kHz to 1.6 GHz	
	HSA1036 (TG)	100 kHz to 3.6 GHz	
	HSA1075 (TG)	100 kHz to 7.5 GHz	
Output power level range	-40 dBm to 0 dBm		
Output power level resolution	1 dB		
Output flatness	relative to 50 MHz $\pm$ 3 dB(nominal)		
Tracking generator spurious	Harmonic spurious	-20 dBc (Tracking generator output power	

		= -10 dBm)
	Non-harmonic spurious	-20 dBc(Tracking generator output power = -10 dBm)
Tracking generator to input terminal isolation	-60 dB (Tracking generator output power = 0 dBm)	

Input/Output	
RF Input	
Impedance	50 Ω , nominal
Connector	N Type Female
Tracking generator output	
Impedance	50 Ω , nominal
Connector	N Type Female
Internal reference	
Frequency	10 MHz
Output level	+3 dBm to +10 dBm, +8 dBm (typical)
Impedance	50 Ω , nominal
Connector	BNC female
External reference	
Frequency	10 MHz $\pm$ 5 ppm
Input level	0 dBm to + 10 dBm
Impedance	50 Ω , nominal
Connector	BNC female
External Trigger Input	
Impedance	1 k Ω , nominal
Connector	BNC female
Audio interface	
Impedance	30 Ω , nominal
Connector	3.5 mm
USB Host	
Connector	A Plug
Protocol	USB version 2.0
USB Device	
Connector	Micro USB
Protocol	version 2.0
LAN	
10/100Base, RJ-45	
Display	
Type	TFT LCD
Resolution	1024*768
Size	8 inches
Color	65536
Mass Memory	
Mass memory	Flash disk (internal storage 50 MByte), USB flash disk (no USB flash disk)
Power Supply	
Power adapter	Input voltage range, AC: 100 V to 240 V, 50 Hz to 60 Hz
Power consumption	28 W (nominal)

Temperature	
Operating Temperature Range	0 °C to 50 °C
Storage Temperature Range	-20 °C to 70 °C
Humidity	
0 °C to 30 °C	≤ 95% relative humidity
30 °C to 40 °C	≤ 75% relative humidity
Altitude	
Operating height	up to 3,000m
Appearance	
Dimensions	265 mm (width)×190 mm (high)×58 mm (depth)
Weight	Approx. 2.5 kg (main engine)
Calibration interval time	
Calibration interval is recommended	18 months



V2.0.0