SSA3000X Series

Spectrum Analyzer

Welectron.

SIGLENT TECHNOLOGIES CO.,LTD

SSA3032X

SSA3021X

General Description

Siglent's SSA3000X series of spectrum analyzers have a frequency range of 9 kHz to 2.1 GHz / 3.2 GHz. With their light weight, small size, and friendly user interface, the SSA3000X offer a bright easy to read display, powerful and reliable automatic measurements, and plenty of powerful features. Applications include broadcast monitoring/evaluation, site surveying, EMI pre-compliance, research and development, education, production, and maintenance.

Features and Benefits

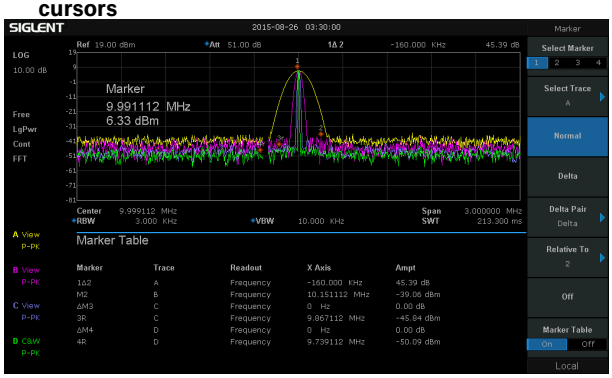
- All-Digital IF Technology
- Frequency Range from 9 kHz up to 3.2 GHz
- -161 dBm/Hz Displayed Average Noise Level (Typ.)
- -98 dBc/Hz @10 kHz Offset Phase Noise (1 GHz, Typ.)
- Total Amplitude Accuracy < 0.7 dB
- 1 Hz Minimum Resolution Bandwidth (RBW)
- Standard Preamplifier
- Up to 3.2 GHz Tracking Generator Kit (Opt.)
- Reflection Measurement Kit (Opt.)
- Advanced Measurement Kit (Opt.)
- EMI Pre-compliance Test Kit (Opt.)
- 10.1 Inch WVGA（1024x600）Display

Model and Main index

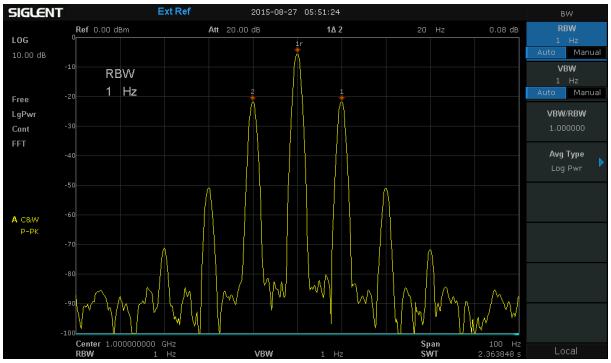
Model	SSA3032X	SSA3021X
Frequency Range	9 kHz~3.2 GHz	9 kHz~2.1 GHz
Resolution Bandwidth	1 Hz~1 MHz, in 1-3-10 sequence	1 Hz~1 MHz, in 1-3-10 sequence
Displayed Average Noise Level	-161 dBm/Hz, Normalize to 1 Hz (typ.)	-161 dBm/Hz, Normalize to 1 Hz (typ.)
Phase Noise	< -98 dBc/Hz@1 GHz, 10 kHz offset	< -98 dBc/Hz@1 GHz, 10 kHz offset
Amplitude Precision	< 0.7 dB	< 0.7 dB

Design features

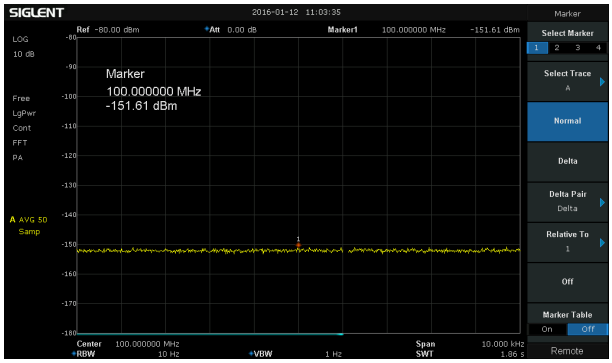
Easy to operate, Support four independent traces and cursors



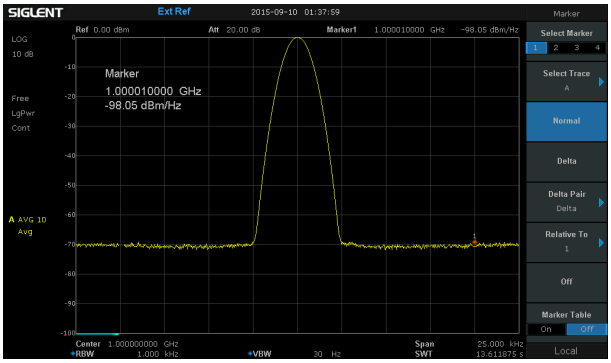
1 Hz Minimum Resolution Bandwidth (RBW)



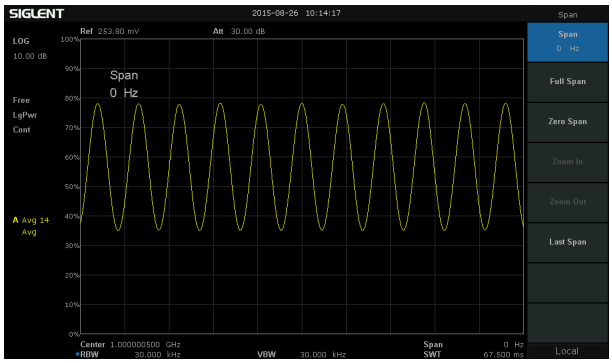
-151 dBm Displayed Average Noise Level (RBW=10 Hz)



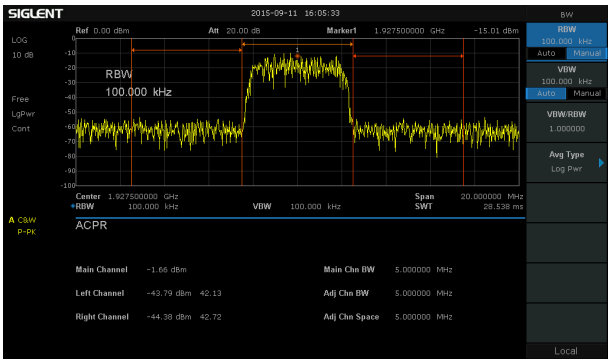
Phase noise -98 dBc/Hz@ 1 GHz, offset 10 kHz



Zero span and demodulation capabilities

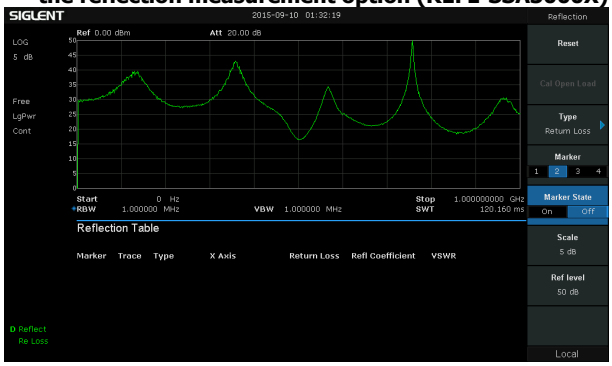


Advanced measurement kit (AMK-SSA3000X) includes on-screen ACPR measurements

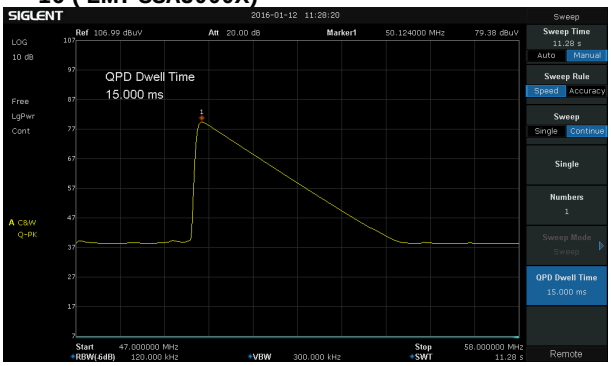


Design features

On-screen VSWR/Return Loss measurements with the reflection measurement option (REFL-SSA3000X)



EMI filter and Quasi-Peak detector following CISPR 16 (EMI-SSA3000X)



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 40 minutes. The specifications include the measurement uncertainty, unless otherwise noted.

Specifications: All products are guaranteed to meet published specifications when operating temperatures from 5 to 45°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

Frequency Characteristic

	SSA3032X	SSA3021X
Frequency		
Frequency range	9 kHz-3.2 GHz	9 kHz-2.1 GHz
Frequency resolution	1 Hz	1 Hz
Frequency Span		
Range	0 Hz, 100 Hz to 3.2 GHz	0 Hz, 100 Hz to 2.1 GHz
Accuracy	± Span / (number of sweep points - 1)	
Internal Reference Source		
Reference frequency	10.000000 MHz	
frequency reference accuracy	± [(time since last adjustment × frequency aging rate) + temperature stability + calibration accuracy]	
Initial calibration accuracy	<1 ppm	
Temperature stability	<1 ppm/year, 0 ℃ ~50 ℃	
Frequency aging rate	<0.5 ppm/first year, 3.0 ppm/20 years	
Marker		
Marker resolution	Span / (number of sweep points - 1)	
Marker uncertainty	± [frequency indication × frequency reference uncertainty + 1% × span + 10% × resolution bandwidth + marker resolution]	
Frequency counter resolution	1 Hz	
Frequency counter uncertainty	± [frequency indication × frequency reference accuracy + counter resolution]	
Bandwidths		
Resolution bandwidth (-3dB)	1 Hz~1 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 ~3 MHz, in 1-3-10 sequence	
VBW uncertainty	<5%	

*The DANL with RBW set to 1 or 3 Hz will be similar to 10 Hz.

Amplitude Characteristic

Amplitude and Level

Measurement range	DANL to +10 dBm, 100 kHz~1 MHz, preamplifier off DANL to +20 dBm, 1 MHz~3.2 GHz, preamplifier off
Reference level	-100 dBm to +30 dBm, 1 dB steps
Preamplifier	20 dB (nom.), 9 kHz~3.2 GHz
Input attenuation	0~51 dB, 1 dB steps
Maximum input DC voltage	+/- 50 V_{DC}
Maximum average RF power	30 dBm, 3 minutes, fc≥10 MHz, attenuation >20 dBm, preamp off
Maximum damage level	33 dBm, fc≥10 MHz, attenuation >20 dBm, preamp off

Displayed Average Noise Level (DANL)

	20 ℃ ~30 ℃ ,attenuation = 0 dB, sample detector, trace average >50		
Preamp off		RBW=10 Hz	Normalization to 1 Hz
	9 kHz~100 kHz	-100 dBm (nom.)	-110 dBm (nom.)
	100 kHz ~1 MHz	-97 dBm, -101 dBm (typ.)	-107 dBm,-111 dBm (typ.)
	1 MHz~10 MHz	-122 dBm, -126 dBm (typ.)	-132 dBm,-136 dBm (typ.)
	10 MHz~200 MHz	-127 dBm,-131 dBm (typ.)	-137 dBm,-141 dBm (typ.)
	200 MHz~2.1 GHz	-125 dBm, -129 dBm (typ.)	-135 dBm,-139 dBm (typ.)
	2.1 GHz~3.2 GHz	-116 dBm, -122 dBm (typ.)	-126 dBm,-132 dBm (typ.)
Preamp on	9 kHz~100 kHz	-107 dBm (nom.)	-117 dBm (nom.)
	100 kHz ~1 MHz	-122 dBm, -127 dBm (typ.)	-132 dBm,-137 dBm (typ.)
	1 MHz~10 MHz	-138 dBm, -144 dBm (typ.)	-148 dBm,-154 dBm (typ.)
	10 MHz~200 MHz	-146 dBm, -151 dBm (typ.)	-156 dBm,-161 dBm (typ.)
	200 MHz~2.1 GHz	-145 dBm, -148 dBm (typ.)	-155 dBm,-158 dBm (typ.)
	2.1 GHz~3.2 GHz	-135 dBm, -139 dBm (typ.)	-145 dBm,-149 dBm (typ.)

Phase Noise

	20 ℃ ~30 ℃ ,fc=1 GHz
Phase noise	<-95 dBc/Hz @10 kHz offset, <-98 dBc/Hz (typ.) <-96 dBc/Hz @100 kHz offset,<-97 dBc/Hz (typ.) <-115 dBc/Hz @1 MHz offset, <-117 dBc/Hz (typ.)

Level Display

Logarithmic level axis	10 dB to 200 dB
Linear level axis	0 to reference level
Units of level axis	dBm, dBmV, dBμV, dBμA, V, W
Number of display points	751
Number of traces	4
Trace detectors	Positive-peak, Negative-peak, Sample, Normal, Average (Voltage/RMS/Video) , Quasi-peak (with EMI option)
Trace functions	Clear write, Max Hold, Min Hold, View, Blank, Average

Frequency Response

	20 ℃ to 30 ℃ , 30% to 70% relative humidity, attenuation = 20 dB, reference frequency 50 MHz
Preamp off	±0.8 dB, ±0.4 dB, (typ.)
Preamp on	±0.9 dB, ±0.5 dB, (typ.)

Error and Accuracy

Resolution bandwidth switching uncertainty	10 kHz RBW Logarithmic resolution ±0.2 dB, liner resolution ±0.01, nominal	
Input attenuation switching uncertainty	20 ℃ to 30 ℃ , fc = 50 MHz, preamp off, Relative to 20 dB, 1 to 51 dB attenuation ±0.5 dB	
Absolute amplitude accuracy	20 ℃ to 30 ℃ , fc = 50 MHz, RBW = 1 kHz, VBW = 1 kHz, peak detector, attenuation = 20 dB, 95th percentile reliability	
	preamp off	±0.4 dB, input signal -20 dBm
	preamp on	±0.5 dB, input signal -40 dBm
Total amplitude accuracy	20 ℃ to 30 ℃ , Fc>100 kHz, input signal -50 dBm~0 dBm, preamp off, 95th percentile reliability	RBW = 1 kHz, VBW = 1 kHz, peak detector, attenuation = 20 dB,
	± 0.7 dB	
RF input VSWR	input attenuation 10 dB, 1 MHz~3.2 GHz <1.5, nom	

Amplitude Characteristic

Distortion and Spurious Responses

Second harmonic distortion	fc≥50 MHz, mixer level -30dBm, attenuation = 0 dB, preamp off, 20 ℃ to 30 ℃ , typ. -65 dBc
Third-order intercept	fc≥50 MHz, two -20 dBm tones at input mixer spaced by 100 kHz, attenuation = 0 dB, preamp off, 20 ℃ to 30 ℃ , typ. +10 dBm
1dB Gain Compression	fc≥50 MHz, attenuation = 0 dB, preamp off, 20 ℃ to 30 ℃ , nom. >-5 dBm
Residual response	input terminated = 50 Ω,attenuation = 0 dB, 20 ℃ to 30 ℃ , typ. <-90 dBm
Input related spurious	Mixer level = -30 dBm, 20 ℃ to 30 ℃ <-65 dBc

Sweep and Trigger

Sweep time	1 ms to 3000 s	
Sweep accuracy	Accuracy, Speed	
Sweep mode	Sweep	FFT
	RBW=30 Hz~1 MHz	RBW=1 Hz~10 kHz
Sweep rule	Single, Continuous	
Trigger source	Free, Video, External	
External trigger	5 V TTL level, rising edge/falling edge	

Tracking Generator (Option)

	SSA3032X	SSA3021X
Frequency range	100 kHz~3.2 GHz	100 kHz~2.1 GHz
RBW	30 Hz~1 MHz, only sweep mode	
Output level	-20 dBm~0 dBm	
Output level resolution	1 dB	
Output flatness	+/-3 dB	
Output maximum reverse level	Mean power:30 dBm,DC: ±50 V_{DC}	

EMI Receiver Measurement (Option)

Resolution bandwidth (6 dB)	200 Hz,9 kHz,120 kHz
Detector	Quasi-peak（following CISPR 16-1-1）
Dwell time	0 us~10 s
PC Application Software	EasySpectrum EMI pre-compliance test Software

Reflection Measurement (Option)

Function	VSWR, Return loss, Reflct coefficiont

Advanced Measurement (Option)

Function	Channel power, Adjacent channel power ratio, Time domain power, Occupied bandwidth, Third-order intercept, Spectrum monitor

External input and external output	
Front panel RF input	50 Ω, N-female
Front panel TG output	50 Ω, N-female
10 MHz reference output	10 MHz, >0 dBm, 50 Ω, BNC-female
10 MHz reference input	10 MHz, -5 dBm~+10 dBm, 50 Ω, BNC-female
External Trigger input	1 kΩ, 5 V TTL , BNC-female
Communication Interface	
USB Host	USB-A 2.0 +
USB Device	USB-B 2.0
LAN	LAN (VXI11), 10/100 Base, RJ-45
General Specification	
Display	TFT LCD, 1024×600(waveform area 751×501), 10.1 inch
Storage	Internal (Flash) 256 MByte, External (USB storage device) 32 GByte
Source	Input voltage range (AC) 100 V~240 V, AC frequency supply 45 Hz~440 Hz, Power consumption 30 W
Temperature	Working temperature 0 ℃ to 50 ℃ , Storage temperature -20 ℃ to 70 ℃
Humidity	0 ℃ to 30 ℃ , ≤95% Relative humidity; 30 ℃ to 50 ℃ , ≤75% Relative humidity
Dimensions	393 mm×207 mm×116.5 mm (W×H×D)
Weight	Contain tracking generator 4.60 kg (10.1 lb)
Electromagnetic Compatibility and Safety	
EMC	EN 61326-1:2013
Electrical safety	EN 61010-1:2010

Ordering Information

Product Description	SSA3000X Spectrum Analyzer	Order Number
Product code	Spectrum Analyzer, 9 kHz~3.2 GHz	SSA3032X
	Spectrum Analyzer, 9 kHz~2.1 GHz	SSA3021X
Standard configurations	A Quick Start, A USB Cable, A CD (Including Quick Start, Data Sheet and Application Software) , A Calibration Certificate	QG-SSA3000X
Utility Options	Tracking Generator Kit	TG-SSA3000X
	Advanced Measurement Kit	AMK-SSA3000X
	Utility Kit: N(M)-SMA(M) cable N(M)-N(M) cable N(M)-BNC(F) adaptor(2 pcs) N(M)-SMA(F) adaptor(2 pcs) 10 dB attenuator	UKitSSA3X
	N(M)-SMA(M) cable	N-SMA-6L
	N(M)-N(M) cable	N-N-6L
	N(M)-BNC(M) cable	N-BNC-2L
	Soft carrying bag	BAG-SCC
EMI Options	EMI Measurement Kit: EMI Filter and Quasi Peak Detector, EMI test option in EasySpectrum Software	EMI-SSA3000X
	Near Field Probe:H field probe sets(25 mm, 10 mm, 5 mm, 2mm), 30 MHz~3.0 GHz	SRF5030
	Near Field Probe:H field probe sets(20 mm, 10 mm, 5 mm) , E field probe (5 mm), 300 kHz~3.0 GHz	SRF5030T
Reflect Measurement Options	Tracking Generator Kit	TG-SSA3000X
	Reflect Measurement Kit	Refl-SSA3000X
	VSWR Bridge Kit：including Refl-SSA3000X VSWR Bridge(1 MHz~2 GHz) N(M)-N(M) adaptor(2 pcs)	RBSSA3X20

About SIGLENT

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

SIGLENT began to research and develop the Digital Oscilloscope independently in 2002. After a decade of development products have included digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, digital multimeters, DC power supplies, spectrum analyzers, and other general purpose test instrumentation. Since SIGLENTs first oscilloscope, the ADS 7000 series produced in 2005, SIGLENT has maintained the highest annual growth rate and has been the fastest developing DSO manufacturer over the past 10 years. Nowadays, SIGLENT Technologies is the leading manufacturer of oscilloscopes by shipments in China.

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