



ENGLISH

Product Datasheet

Stock No: 1236443  
1236444

## RS Pro SPECTRUM ANALYZER SSA3000X SERIES



RSSA3032X

RSSA3021X

## General Description

RSSA3000X 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 RSSA3000X offer a bright easy to read display, powerful and reliable automatic measurements, and plenty of powerful features. Applications include broadcast monitoring, transmitter repair, EMC/EMI pre-compliance, R&D, education, production, and RF system maintenance.

## Features and Benefits

- All-Digital IF Technology
- Frequency Range from 9 kHz up to 3.2GHz
- 161 dBm/Hz Displayed Average Noise Level(Typ.)
- 98 dBc/Hz @10 kHz Offset Phase Noise (1GHz,Typ.)
- Total Amplitude Accuracy < 0.7dB
- 10 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

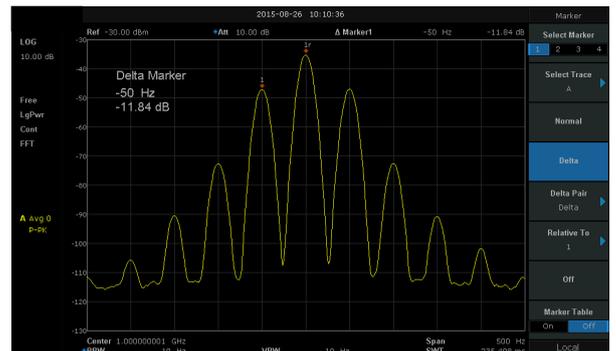
Model	RSSA302X	RSSA3021X
Frequency Range	9 kHz~3.2 GHz	9 kHz~2.1 GHz
Resolution Bandwidth	10 Hz~1 MHz, in 1-3-10 sequence	10 Hz~1 MHz, in 1-3-10 sequence
Displayed Average Noise Level	-161 dBm/Hz, Normalize to 1 Hz (typ.)	-161 dBm/Hz, Normalize to 1 Hz (typ.)
Phase Noise	< -98 dBc/Hz@1 GHz, 10 kHz offset	< -98 dBc/Hz@1 GHz, 10 kHz offset
Amplitude	< 0.7 dB	< 0.7 dB

## Design features

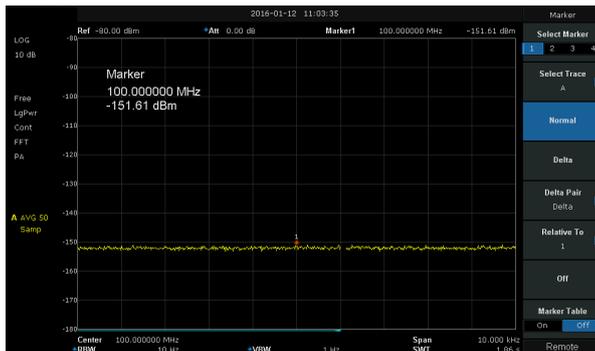
Features four independent traces and markers



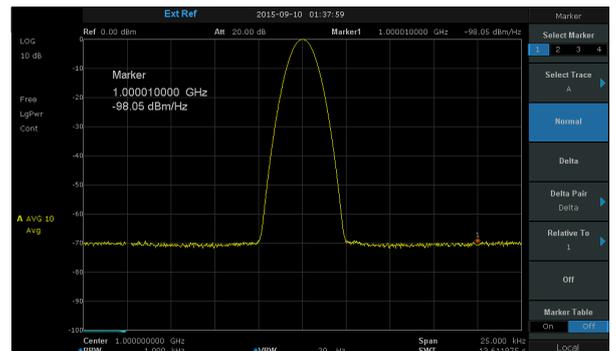
10 Hz Minimum Resolution Bandwidth(RBW)



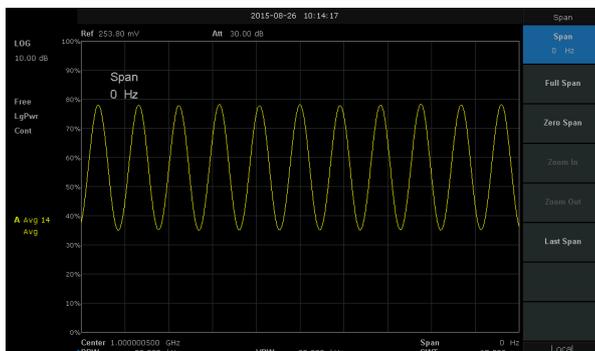
-151 dBm Displayed Average Noise Level (RBW=10Hz)



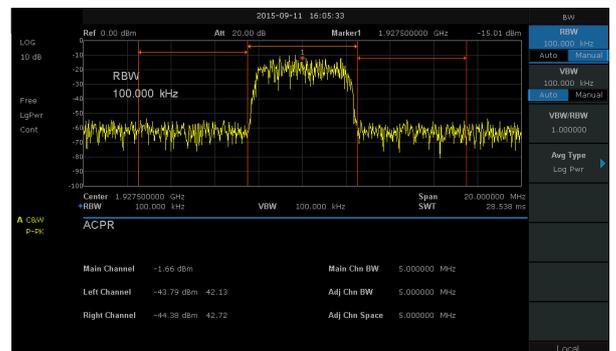
Phase noise -98 dBc/Hz@ 1 GHz, offset 10kHz



Zero span and AM/FM Demodulation

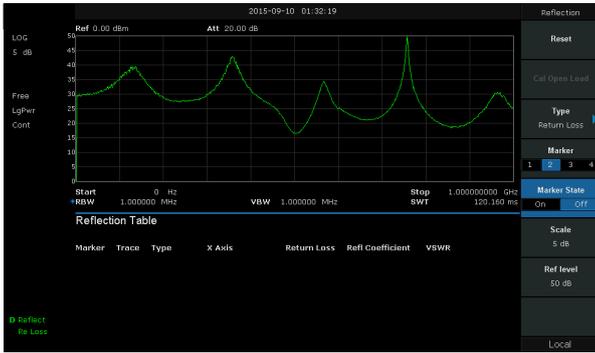


6 common broadcast measurements on-screen (Option AMK-RSSA3000X)

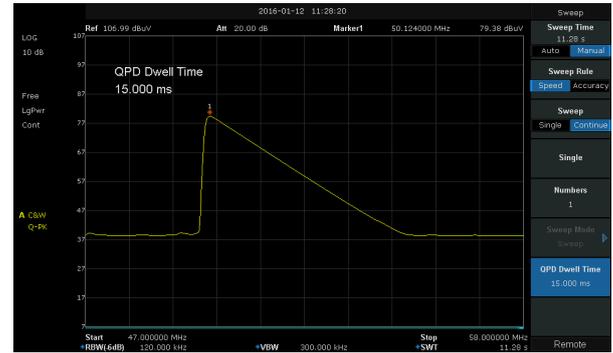


## Design features

### On-screen returnloss/VSWR measurements (Option refl-SSA3000X)



### EMI filter, Quasi-Peak detector (Option EMI-SSA3000X)



## Specifications

Specifications are valid under the following conditions: The instrument is within the calibration period, has been stored between 0 °C to 50 °C for at least two 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 in the temperature range from 5 °C to 45 °C, unless otherwise noted.

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

**Nominal:** The expected mean or average performance or a designed attribute such as the 50 Ω connector. Nominal performance is not warranted and does not include the measurement uncertainty.

### Frequency Characteristic

	RSSA3032X	RSSA3021X
<b>Frequency</b>		
Frequency range	9 kHz-3.2 GHz	9 kHz-2.1 GHz
Frequency resolution	1 Hz	1 Hz
<b>Frequency Span</b>		
Range	0 Hz, 100 Hz to 3.2GHz	0 Hz, 100 Hz to 2.1GHz
Accuracy	± Span / (number of sweep points - 1)	
<b>Internal Reference Source</b>		
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 °C ~50 °C	
Frequency aging rate	<0.5 ppm/first year, 3.0 ppm/20 years	
<b>Marker</b>		
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]	
<b>Bandwidths</b>		
Resolution bandwidth (-3dB)	10 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%	

## 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 <sub>DC</sub>
Maximum series RF power	33 dBm, 3 minutes, input attenuation >20 dB

### Displayed Average Noise Level (DANL)

20 °C ~30 °C ,attenuation = 0 dB, sample detector, trace average >50

		RBW=10 Hz	Normalization to 1 Hz
Preamp off	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 °C ~30 °C ,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.)
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### Level Display

Logarithmic level axis	10 dB to 100 dB
Linear level axis	0 to reference level
Units of level axis	dBm, dBmV, dBμV, 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 °C to 30 °C , 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 °C to 30 °C , fc = 50 MHz, preamp off, Relative to 20 dB, 1 to 51 dB attenuation ±0.5 dB
Absolute amplitude accuracy	20 °C to 30 °C , fc = 50 MHz, RBW = 1 kHz, VBW = 1 kHz, peak detector, attenuation = 20 dB, 95th percentile reliability
	preamp off preamp on
Total amplitude accuracy	20 °C to 30 °C , Fc>100 kHz, input signal -50 dBm~0 dBm, RBW = 1 kHz, VBW = 1 kHz, peak detector, attenuation = 20 dB, preamp off, 95th percentile reliability
	± 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 °C to 30 °C -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 °C to 30 °C +10 dBm
1dB Gain Compression	fc≥50 MHz, attenuation = 0 dB, preamp off, 20 °C to 30 °C >-5 dBm,nom.
Residual response	input terminated = 50 Ω,attenuation = 0 dB, 20 °C to 30 °C <-90 dBm,typ.
Input related spurious	Mixer level = -30 dBm, 20 °C to 30 °C <-65 dBc

## Sweep and Trigger

Sweep time	1 ms to 3000 s
Sweep accuracy	Accuracy, Speed
Sweep mode	Sweep, FFT
Sweep rule	Single, Continuous
Trigger source	Free, Video, External
External trigger	5 V TTL level, rising edge/falling edge

## Tracking Generator (Option)

	RSSA3032X	RSSA3021X
Frequency range	100 kHz~3.2 GHz	100 kHz~2.1 GHz
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 <sub>DC</sub>	

## EMI Receiver Measurement (Option)

Resolution bandwidth (6 dB)	200 Hz,9 kHz,120 kHz
Detector	Quasi-peak (following CISPR 16 recommended response guidelines)
Dwell time	0 us~10 s
PC Application Software	Auto pre-compliance test: pre-scan, peak search, final scan

## Reflection Measurement (Option)

Function	VSWR, Return Loss
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## Advanced Measurement (Option)

Function	Channel power, Adjacent channel powerratio, Time domain power, Occupiedbandwidth, Third-order intercept,
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## External input and external output

Front panel RF input	50 $\Omega$ , N-female
Front panel TG output	50 $\Omega$ , N-female
10 MHz reference output	10 MHz, >0 dBm, 50 $\Omega$ , BNC-female
10 MHz reference input	10 MHz, -5 dBm~+10 dBm, 50 $\Omega$ , BNC-female
External Trigger input	1 k $\Omega$ , 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, 1024x600(waveform area 751x501), 10.1 inch
Storage	Internal (Flash) 256 MB, External (USB storage device) 32 GB
Source	Input voltage range (AC) 100 V~240 V, AC frequency supply 45 Hz~440 Hz, Power consumption 30 W
Temperature	Working temperature 0 $^{\circ}$ C to 50 $^{\circ}$ C , Storage temperature -20 $^{\circ}$ C to 70 $^{\circ}$ C
Humidity	0 $^{\circ}$ C to 30 $^{\circ}$ C , $\leq$ 95% Relative humidity; 30 $^{\circ}$ C to 50 $^{\circ}$ C , $\leq$ 75% Relative humidity
Dimensions	393 mmx207 mmx116.5 mm (WxHxD)
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	RSSA3000X Spectrum Analyzer	Order Number	
Product code	Spectrum Analyzer, 9 kHz~3.2 GHz	RSSA3032X	
	Spectrum Analyzer, 9 kHz~2.1 GHz	RSSA3021X	
Standard configurations	A Quick Start, A Product Certification, A USB Cable, A CD (Including Quick Start, Data Sheet and Application Software) , A Calibration Certificate	QG-RSSA3000X	
Utility Options	Tracking Generator Kit	TG-RSSA3000X	
	Advanced Measurement Kit	AMK-RSSA3000X	
	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	UKitRSSA3X	
	N(M)-SMA(M) cable	RSN-SMA-6L	
	N(M)-N(M) cable	RSN-N-6L	
	N(M)-BNC(M) cable	RSN-BNC-2L	
	Soft carrying bag	RSBAG-SCC	
	EMI	EMI Measurement Kit	EMI-RSSA3000X
	Reflect Measurement Options	Tracking Generator Kit	TG-RSSA3000X
		Reflect Measurement Kit	Refl-RSSA3000X
VSWR Bridge Kit: including Refl-RSSA3000X VSWR Bridge(1 MHz~2 GHz) N(M)-N(M) adaptor(2 pcs)		RBSSA3X20	