

SPA-900TG Series Spectrum Analyzer



SPA-932TG

SPA-921TG

General Description

Com-Power’s SPA-900TG 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 SPA-900TG 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



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Model and Main index

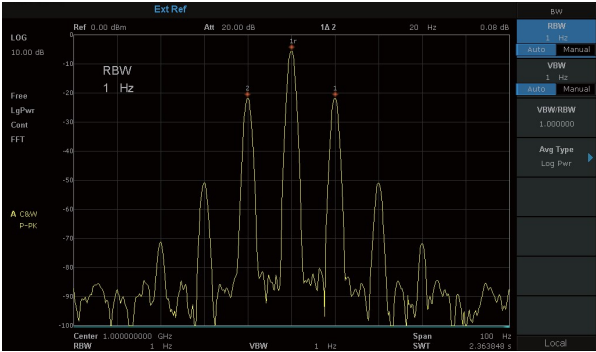
Model	SPA-932TG	SPA-921TG
Frequency Range	9 kHz~3.2 GHz	9 kHz~2.1 GHz
Resolution Bandwidth	1 Hz~1 MHz, in 1-3-10 sequence	1 Hz~1 MHz, in 1-3-10 sequence
Displayed Average Noise Level	-161 dBm/Hz, Normalize to 1 Hz (typ.)	-161 dBm/Hz, Normalize to 1 Hz (typ.)
Phase Noise	< -98 dBc/Hz@1 GHz, 10 kHz offset	< -98 dBc/Hz@1 GHz, 10 kHz offset
Amplitude Precision	< 0.7 dB	< 0.7 dB

Design features

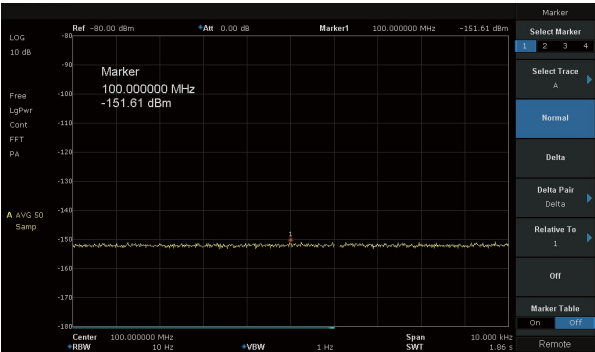
Easy to operate, Support four independent traces and cursors



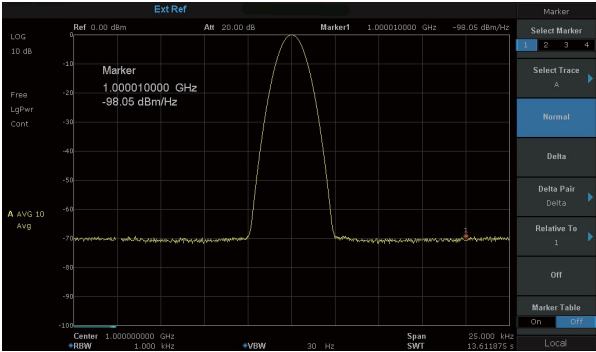
1 Hz Minimum Resolution Bandwidth (RBW)



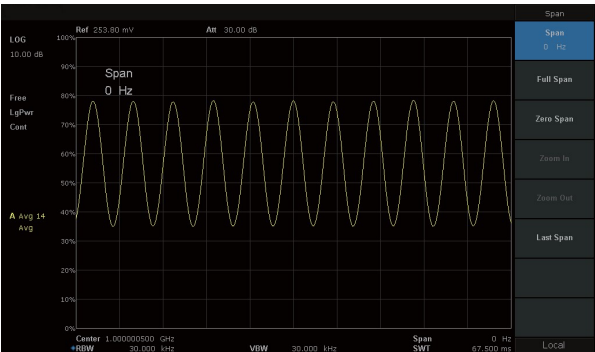
-151 dBm Displayed Average Noise Level (RBW=10 Hz)



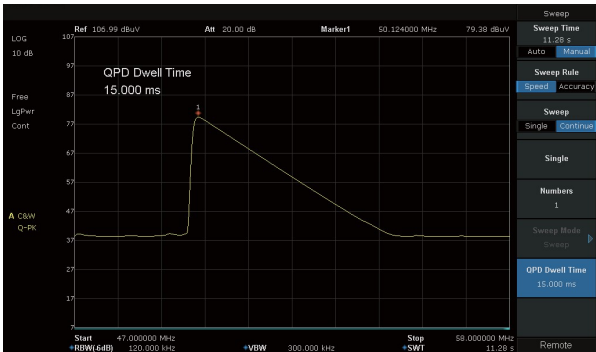
Phase noise -98 dBc/Hz@ 1 GHz, offset 10 kHz



Zero span and demodulation capabilities



EMI filter and Quasi-Peak detector following CISPR 16



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		
	SPA-932TG	SPA-921TG
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, f _c ≥10 MHz, attenuation >20 dBm, preamp off		
Maximum damage level	33 dBm, f _c ≥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 ℃ ,f _c =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 ℃ , f _c = 50 MHz, preamp off, Relative to 20 dB, 1 to 51 dB attenuation ±0.5 dB		
Absolute amplitude accuracy	20 ℃ to 30 ℃ , f _c = 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 ℃ , F _c >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 ℃ 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		
	SPA-932TG	SPA-921TG
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	
Resolution bandwidth (6 dB)	200 Hz,9 kHz,120 kHz
Detector	Quasi-peak（following CISPR 16-1-1）
Dwell time	0 us~10 s

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

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