



Datasheet

3GHz Spectrum Analyzer

Stock number : 180-4795 **RSSA-9300B** 180-4796 **RSSA-9300B TG**

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FEATURES

- Frequency Range : 9kHz ~ 3 GHz
- 0.025ppm Frequency Stability and 1ppm Aging Rate
- Built-in Preamplifier, 50dB Attenuator, and Sequence Function
- RBW : 1Hz ~ 1MHz
- Sensitivity : -149dBm/Hz (@PreAmp on)
- Built-in AM/FM Demodulation & Analysis
- Built-in P1dB Point, Harmonic, Channel Power, N-dB Bandwidth, OCBW, ACPR, SEM, TOI, CNR, CTB, CSO, Noise Marker, Frequency Counter, Time Domain Power, Gated Sweep
- Built-in Spectrogram, Topographic and Dual-View Display Modes
- Remote Control Software : SpectrumShot
- Remote Control Interface : LAN, USB, RS-232
- Options : Tracking Generator, GPIB Interface, Battery Pack

PRACTICAL, AFFORDABLE AND NEVER CARELESS!

RSSA-9300B is a 3GHz spectrum analyzer to meet basic RF measurement requirements. It provides the frequency stability of 0.025ppm; the aging rate of 1ppm/year; a built-in preamplifier; the base noise of -149dBm/Hz, and more than 20 measurement applications, including AM/FM modulation signal analysis, signal channel analysis, and CATV parameter test. While collocating with TG option, RSSA-9300B can conduct frequency response or power linearity tests for components.

For monitoring signals, RSSA-9300B provides Topographic display mode, which is capable of distinguishing continuous or random signals by using color temperature. Spectrogram mode provides a time axis on spectrum display that allows users to observe signal variations based upon the reference of time. Split window mode allows different parameter settings for each display window. Additionally, RSSA-9300B also provides user-friendly user interfaces such as display mode, help, multi-languages, and fast data logging, etc. Interfaces and software include USB/RS-232/LAN/MicroSD/GPIB (option)/DVI output and dedicated PC software IVI Driver.

PSSA-9300B, with its unique features, including auto wake-up, sequence function, and limit line testing, is specially designed to meet the requirements of production lines. The patent design of heat conduction allows RSSA-9300B to substantially reduce the warm-up time so as to expedite production processes. Options include tracking generator, carrying bag, battery module, rack accessories. The compact design of RSSA-9300B satisfies either field testing or the integration of automatic testing systems.

To sum up, RSSA-9300B is a stable, light and all-purpose test equipment, which is the most ideal choice for the educational market, production line, and general signal monitoring applications, etc. Most important, the pricing of RSSA-9300B is beyond your imagination and it is the number one choice for users with budget considerations.

Frequency Stability : 0.025ppm

Wireless communications applications are nowadays ubiquitous. Signals in the limited spectrum are getting very crowded. Therefore, the demands of signal efficiency and frequency stability are higher and stricter. To meet high precision measurement requirements, RSSA-9300B provides the frequency stability of 0.025ppm and the aging rate of 1ppm/year, which only appear in high-end T&M equipment.

Built-in Preamplifier

Engineers often face the challenge of measuring small RF signals during product development stage. RSSA-9300B built-in preamplifier provides the base noise of -149dBm. When collocating with the built-in EMI filter and the dedicated EMI near field probe, RSSA-9300B can conduct EMI tests and debugging.

More Than 20 Measurement Applications

RSSA-9300B provides rich signal processing functions, including AM/FM modulation signal analysis, signal channel analysis, and CATV parameter test, characteristic test on signal stability, and frequency response or power linearity tests for components to substantially bring up the measurement convenience. Most competitors in the same class only offer a few test functions, and the standard built-in functions of RSSA-9300B are options for competitors.

SPECIFICATIONS

FREQUENCY		
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Range	9 kHz ~ 3 GHz	
Resolution	1 Hz	
FREQUENCY REFERENCE		
Accuracy	$\pm(\text{period since last adjustment} \times \text{aging rate}) + \text{stability over temperature} + \text{supply voltage stability}$	
Aging Rate	$\pm 1 \text{ ppm max.}$	1 year after last adjustment
Frequency Stability Over Temperature	$\pm 0.025 \text{ ppm}$	0 ~ 50 °C
Supply Voltage Stability	$\pm 0.02 \text{ ppm}$	
FREQUENCY READOUT ACCURACY		
Start, Stop, Center, Marker	$\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + 10\% \times \text{RBW} + \text{frequency resolution})$	
Trace Points	Max. 601 points, Min. 6 points	
MARKER FREQUENCY COUNTER		
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
Accuracy	$\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + \text{counter resolution})$	RBW/Span ≥ 0.02 ; Mkr level to DNL > 30 dB
FREQUENCY SPAN		
Range	0 Hz (zero span), 100 Hz ~ 3 GHz	
Resolution	1 Hz	
Accuracy	$\pm \text{frequency resolution}$	RBW : Auto



SPECIFICATIONS

PHASE NOISE		
Offset from Carrier 10 kHz 100 kHz 1 MHz	< -88 dBc/Hz < -95 dBc/Hz < -113 dBc/Hz	Fc=1GHz;RBW=1kHz,VBW=10Hz;Average≥40 Typical Typical Typical
RESOLUTION BANDWIDTH (RBW) FILTER		
Filter Bandwidth Accuracy Shape Factor	1 Hz ~ 1 MHz in 1-3-10 sequence 200 Hz, 9 kHz, 120 kHz, 1MHz ± 8%, RBW = 1MHz ; ± 5%, RBW < 1MHz <4.5 : 1	-3dB bandwidth -6dB bandwidth Nominal Normal Bandwidth ratio: -60dB:-3dB
VIDEO BANDWIDTH (VBW) FILTER		
Filter Bandwidth	1 Hz ~ 1 MHz in 1-3-10 sequence	-3dB bandwidth
AMPLITUDE		
AMPLITUDE RANGE		
Measurement Range	100 kHz ~ 1 MHz 1 MHz ~ 10 MHz 10 MHz ~ 3 GHz	Displayed Average Noise Level(DANL)to 18 dBm DANL to 21 dBm DANL to 30 dBm
ATTENUATOR		
Input Attenuator Range	0 ~ 50 dB, in 1 dB steps	Auto or manual setup
MAXIMUM SAFE INPUT LEVEL		
Average Total Power DC Voltage	≤ +33 dBm ± 50 V	Input attenuator ≥ 10 dB
1 dB GAIN COMPRESSION		
Total Power at 1st Mixer Total Power at the Preamp	> 0 dBm > -22 dBm	Typical ; Fc ≥ 50 MHz; preamp. off Typical ; Fc ≥ 50 MHz; preamp. on Mixer power level (dBm) = input power (dBm) – attenuation (dB)
DISPLAYED AVERAGE NOISE LEVEL (DANL)		
Preamp off	0 dB attenuation; RF Input is terminated with a 50Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = - 60 dBm; trace average ≥ 40	
9 kHz~100 kHz 100 kHz~1 MHz 1 MHz~10 MHz 2.7 ~ 3.25 GHz	< -93 dBm < -90 dBm - 3 x (f/100 kHz) dB < -122 dBm < -116 dBm	Nominal Nominal Nominal Nominal
Preamp on	0 dB attenuation; RF Input is terminated with a 50Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = - 60 dBm; trace average ≥ 40	
100 kHz~1 MHz 1 MHz~10 MHz 10 MHz~3.25 GHz	< -108 dBm - 3 x (f/100 kHz) dB < -142 dBm < -142 dBm + 3 x (f/1 GHz) dB	Nominal Nominal Nominal
LEVEL DISPLAY RANGE		
Scales Units Marker Level Readout Level Display Modes Number of Traces Detector Trace Functions	Log, Linear dBm, dBmV, dBuV, V, W 0.01 dB 0.01 % of reference level Trace, Topographic, Spectrogram 4 Positive-peak,negative-peak,sample,normal,RMS(not Video), Quasi-Peak(EMI),Average(EMI),Clear & Write,Max/Min Hold, View, Blank, Average	Log scale Linear scale Single/Split Windows
ABSOLUTE AMPLITUDE ACCURACY		
Absolute Point Preamp Off Preamp On	Center=160 MHz ; RBW 10 kHz; VBW 1 kHz; span 100 kHz; log scale; 1 dB/div; peak detector; 23°C±1°C; Signal at Reference Level ± 0.3 dB ± 0.4 dB	Ref level 0 dBm; 10 dB RF attenuation Ref level -30dBm; 0dB RF attenuation
FREQUENCY RESPONSE		
Preamp Off 100 kHz ~ 2.0 GHz 2GHz ~ 3 GHz Preamp On 1 MHz ~ 2 GHz 2 GHz ~ 3 GHz	Attenuation : 10 dB; Reference: 160 MHz; 20 ~ 30°C ± 0.5 dB ± 0.7 dB Attenuation: 0 dB; Reference: 160 MHz; 20 ~ 30°C ± 0.6 dB ± 0.8 dB	
ATTENUATION SWITCHING UNCERTAINTY		
Attenuator Setting Uncertainty	0 ~ 50 dB in 1 dB step ± 0.25 dB	Reference : 160 MHz, 10dB attenuation
RBW FILTER SWITCHING UNCERTAINTY		
1 Hz ~ 1 MHz	± 0.25 dB	Reference : 10 kHz RBW
LEVEL MEASUREMENT UNCERTAINTY		
Overall Amplitude Accuracy	± 1.5 dB ± 0.5 dB	20 ~ 30°C; frequency > 1 MHz; Signal input 0 ~ -50 dBm; Reference level 0 ~ -50 dBm; Input attenuation 10 dB; RBW 1 kHz; VBW 1 kHz; after cal; Preamp Off Typical
SPURIOUS RESPONSE		
Second Harmonic Intercept Third-order Intercept Input Related Spurious Residual Response (Inherent)	+35 dBm +60 dBm > 1dBm < -60 dBc < -90 dBm	Preamp off; signal input -30dBm; 0 dB attenuation Typical; 10 MHz < fc < 775 MHz Typical; 775 MHz ≤ fc < 1.625 GHz Preamp off; signal input -30dBm; 0 dB attenuation 300 MHz ~ 3 GHz Input signal level -30 dBm, Att. Mode, Att = 0dB; 20 ~ 30°C Input terminated; 0 dB attenuation; Preamp off



SPECIFICATIONS

SWEEP		
SWEEP TIME		
Range	204 μ s ~ 1000 s 50 μ s ~ 1000 s	Span > 0 Hz Span = 0 Hz; Min resolution = 10 μ s
Sweep Mode	Continuous; Single	
Trigger Source	Free run; Video; External	
Trigger Slope	Positive or negative edge	
RF PREAMPLIFIER		
Frequency Range	1 MHz ~ 3 GHz	
Gain	18 dB	Nominal (installed as standard)
FRONT PANEL INPUT/OUTPUT		
RF INPUT		
Connector Type	N-type female	
Impedance	50 Ω	Nominal
VSWR	<1.6 : 1	300 kHz ~ 3 GHz ; Input attenuator \geq 10 dB
POWER FOR OPTION		
Connector Type	SMB male	
Voltage/Current	DC +7V/500 mA max	With short-circuit protection
USB HOST		
Connector Type	A plug	
Protocol	Version 2.0	Support Full/High/Low speed
MICRO SD SOCKET		
Protocol	SD 1.1	
Support Cards	Micro SD, Micro SDHC	Up to 32GB capacity
REAR PANEL INPUT/OUTPUT		
REFERENCE OUTPUT		
Connector Type	BNC female	
Output Frequency	10 MHz	Nominal
Output Amplitude	3.3V CMOS	
Output Impedance	50 Ω	
REFERENCE INPUT		
Connector Type	BNC female	
Input Reference Frequency	10 MHz	
Input Amplitude	-5 dBm ~ +10 dBm	
Frequency Lock Range	Within \pm 5 ppm of the input reference frequency	
ALARM OUTPUT		
Connector Type	BNC female	Open-collector
TRIGGER INPUT/GATED SWEEP INPUT		
Connector Type	BNC female	
Input Amplitude	3.3V CMOS	
Switch	Auto selection by function	
LAN TCP/IP INTERFACE		
Connector Type	RJ-45	
Base	10Base-T; 100Base-Tx; Auto-MDIX	
USB DEVICE		
Connector Type	B plug	
Protocol	Version 2.0	For remote control only; supports USB TMC Supports Full/High/Low speed
IF OUTPUT		
Connector Type	SMA female	
Impedance	50 Ω	Nominal
IF Frequency	886 MHz	Nominal
Output Level	-25 dBm	10 dB attenuation; RF input : 0 dBm @ 1 GHz
EARPHONE OUTPUT		
Connector Type	3.5mm stereo jack, wired for mono operation	
VIDEO OUTPUT		
Connector Type	DVI-I (integrated analog and digital), Single Link. Compatible with VGA or HDMI standard through adapter	
RS-232C INTERFACE		
Connector Type	D-sub 9-pin female	Tx , Rx , RTS , CTS
GPIB INTERFACE (OPTIONAL)		
Connector Type	IEEE-488 bus connector	
AC POWER INPUT		
Power Source	AC 100 V ~ 240 V, 50/60 Hz	Auto range selection
BATTERY PACK (OPTIONAL)		
Battery Pack	6 cells, Li-Ion rechargeable, 3S2P	
Voltage	DC 10.8 V	With UN38.3 Certification
Capacity	5200 mAh/56Wh	
GENERAL		
Internal Data Storage	16 MB nominal	
Power Consumption	< 65 W	
Warm-up Time	< 30 minutes	
Temperature Range	+5 $^{\circ}$ C ~ + 45 $^{\circ}$ C -20 $^{\circ}$ C ~ + 70 $^{\circ}$ C	Operating Storage
Dimensions & Weight	350(W) x 210(H) x 100(D) mm, Approx. 4.5kg 13.8(W) x 8.3(H) x 3.9(D) inch, Approx. 9.9lb	Inc. all options (Basic + TG + GPIB + Battery)
TRACKING GENERATOR (OPTIONAL)		
Frequency Range	100 kHz ~ 3 GHz	
Output Power	-50 dBm ~ 0 dBm in 0.5 dB steps	
Connector Type	N-type female	50 Ω Nominal
Output VSWR	< 1.6 : 1	300 kHz ~ 3 GHz, source attenuation \geq 12 dB

Note : The specifications apply when the RSSA-9300B is powered on for at least 30 minutes to warm-up to a temperature of 20 $^{\circ}$ C to 30 $^{\circ}$ C, unless specified otherwise.

Specifications subject to change without notice.

ORDERING INFORMATION

RSSA-9300B 3 GHz Spectrum Analyzer

ACCESSORIES

Power Cord, Certificate of Calibration, CD-ROM (with Quick Start Guide, User Manual, Programming Manual, SpectrumShot Software, SpectrumShot Guide & IVI Driver)

OPTIONS

Opt.01 Tracking Generator	Opt.03 GPIB Interface
Opt.02 Battery Pack	

OPTIONAL ACCESSORIES

GSC-009 Soft Carrying Case	GRA-415 Rack Adapter Panel
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FREE DOWNLOAD

SpectrumShot PC Software for Windows System (available on RS website)
IVI Driver Supports LabVIEW/LabWindows/CVI Programming (available on NI website)



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