3GHz SPECTRUM ANALYZER

GSP-9300B

CE USB LXI RS-232 GPIB PC Software

PRACTICAL, AFFORDABLE AND NEVER CARELESS!

GSP-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, GSP-9300B can conduct frequency response or power linearity tests for components.

For monitoring signals, GSP-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, GSP-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/LXI/MicroSD/GPIB (option) output and dedicated PC software IVI Driver.

GSP-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 GSP-9300B to substantially reduce the warm-up time so as to expedite production processes. Options include tracking generator, carrying bag, battery module, EMI antenna set and rack accessories. The compact design of GSP-9300B satisfies either field testing or the integration of automatic testing systems.

To sum up, GSP-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 GSP-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, GSP-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. GSP-9300B's built-in preamplifier provides the base noise of -149dBm. When collocating with the built-in EMI filter and the dedicated EMI near field probe, GSP-9300B can conduct EMI tests and debugging.
More Than 20 Measurement Applications	GSP-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 GSP-9300B are options for competitors.

SPECIFICATIONS

FREQUENCY

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Range	9 kHz ~ 3 GHz	
Resolution	1 Hz	

FREQUENCY REFERENCE

Accuracy	±(period since last adjustment x aging rate) + stability over temperature + supply voltage stability	
Aging Rate	± 1 ppm max.	1 year after last adjustment
Frequency Stability Over Temperature	± 0.025 ppm	0 ~ 50 °C
Supply Voltage Stability	± 0.02 ppm	

FREQUENCY READOUT ACCURACY

Start, Stop, Center, Marker	±(marker frequency indication x frequency reference accuracy + 10% x RBW + frequency resolution)	
Trace Points	Max. 601 points, Min. 6 points	

MARKER FREQUENCY COUNTER

Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
Accuracy	±(marker frequency indication X frequency reference accuracy + 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	± frequency resolution	RBW : Auto

PHASE NOISE

Offset from Carrier		Fc=1GHz;RBW=1kHz,VBW=10Hz;Average≥40
10 kHz	< -88 dBc/Hz	Typical
100 kHz	< -95 dBc/Hz	Typical
1 MHz	< -113 dBc/Hz	Typical

RESOLUTION BANDWIDTH (RBW) FILTER

Filter Bandwidth	1 Hz ~ 1 MHz in 1-3-10 sequence 200 Hz, 9 kHz, 120 kHz, 1MHz	-3dB bandwidth -6dB bandwidth
Accuracy	± 8%, RBW = 1MHz ; ± 5%, RBW < 1MHz	Nominal
Shape Factor	<4.5 : 1	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	Displayed Average Noise Level(DANL)to 18 dBm
	1 MHz ~ 10 MHz	DANL to 21 dBm
	10 MHz ~ 3 GHz	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	≤+33 dBm	Input attenuator ≥10 dB
DC Voltage	± 50 V	

1 dB GAIN COMPRESSION

Total Power at 1st Mixer	> 0 dBm	Typical ; Fc≥ 50 MHz; preamp. off
Total Power at the Preamp	> -22 dBm	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	< -93 dBm	Nominal
100 kHz~1 MHz	< -90 dBm - 3 x (f/100 kHz) dB	Nominal
1 MHz~10 MHz	< -122 dBm	Nominal
2.7 ~ 3.25 GHz	< -116 dBm	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	< -108 dBm - 3 x (f/100 kHz) dB	Nominal
1 MHz~10 MHz	< -142 dBm	Nominal
10 MHz~3.25 GHz	< -142 dBm + 3 x (f/1 GHz) dB	Nominal

LEVEL DISPLAY RANGE

Scales	Log, Linear	
Units	dBm, dBmV, dBuV, V, W	
Marker Level Readout	0.01 dB	Log scale
	0.01 % of reference level	Linear scale
Level Display Modes	Trace, Topographic, Spectrogram	Single/Split Windows
Number of Traces	4	
Detector	Positive-peak,negative-peak,sample,normal,RMS(not Video), Quasi-Peak(EMI),Average(EMI)	
Trace Functions	Clear & Write,Max/Min Hold, View, Blank, Average	

ABSOLUTE AMPLITUDE ACCURACY

Absolute Point	Center=160 MHz ; RBW 10 kHz; VBW 1 kHz; span 100 kHz; log scale; 1 dB/div; peak detector; 23°C±5°C; Signal at Reference Level	
Preamp Off	± 0.5 dB	Ref level 0 dBm; 10 dB RF attenuation
Preamp On	± 0.6 dB	Ref level -30dBm; 0dB RF attenuation

FREQUENCY RESPONSE

Preamp Off	Attenuation : 10 dB; Reference: 160 MHz; 20 ~ 30°C	
100 kHz ~ 2.0 GHz	± 0.5 dB	
2GHz ~ 3 GHz	± 0.7 dB	
Preamp On	Attenuation: 0 dB; Reference: 160 MHz; 20 ~ 30°C	
1 MHz ~ 2 GHz	± 0.6 dB	
2 GHz ~ 3 GHz	± 0.8 dB	

ATTENUATION SWITCHING UNCERTAINTY

Attenuator Setting	0 ~ 50 dB in 1 dB step	
Uncertainty	± 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	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
	± 0.5 dB	Typical

SPECIFICATIONS

SPURIOUS RESPONSE		
Second Harmonic Intercept		Preamp off; signal input -30dBm; 0 dB attenuation
	+35 dBm	Typical; 10 MHz < fc < 775 MHz
	+60 dBm	Typical; 775 MHz ≤ fc < 1.625 GHz
Third-order Intercept		Preamp off; signal input -30dBm; 0 dB attenuation
	> 1dBm	300 MHz ~ 3 GHz
Input Related Spurious	< -60 dBc	Input signal level -30 dBm, Att. Mode, Att = 0dB; 20 ~ 30°C
Residual Response (Inherent)	<-90 dBm	Input terminated; 0 dB attenuation; Preamp off
SWEEP		
SWEEP TIME		
Range	204 µs ~ 1000 s	Span > 0 Hz
	50 µs ~ 1000 s	Span = 0 Hz; Min resolution = 10µ 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	50Ω	Nominal
VSWR	<1.6 :1	300 kHz ~ 3 GHz ; Input attenuator ≥ 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	50Ω	
REFERENCE INPUT		
Connector Type	BNC female	
Input Reference Frequency	10 MHz	
Input Amplitude	-5 dBm ~ +10 dBm	
Frequency Lock Range	Within ± 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	For remote control only; supports USB TMC
Protocol	Version 2.0	Supports Full/High/Low speed
IF OUTPUT		
Connector Type	SMA female	
Impedance	50Ω	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	
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	With UN38.3 Certification
Voltage	DC 10.8 V	
Capacity	5200 mAh/56Wh	
GENERAL		
Internal Data Storage	16 MB nominal	
Power Consumption	< 65 W	
Warm-up Time	< 30 minutes	
Temperature Range	+5 °C ~ + 45 °C	Operating
	-20 °C ~ + 70 °C	Storage
Dimensions & Weight	350(W) x 210(H) x 100(D) mm, Approx. 4.5kg	Inc. all options (Basic + TG + GPIB + Battery)
	13.8(W) x 8.3(H) x 3.9(D) inch, Approx. 9.9lb	
Calibration Cycle	The recommended calibration cycle is one year; calibration services are available through GW Instek's authorized calibration services.	
TRACKING GENERATOR (OPTIONAL)		
Frequency Range	100 kHz ~ 3 GHz	
Output Power	-50 dBm ~ 0 dBm in 0.5 dB steps	
Absolute Accuracy	± 0.5 dB	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 ~ 30°C
Output Flatness	Referenced ~ 160 MHz, -10 dBm	
	100 kHz ~ 2 GHz	± 1.5 dB
	2 GHz ~ 3 GHz	± 2 dB
Output Level Switching Uncertainty	± 0.8 dB	Referenced to -10 dBm
Harmonics	< -30 dBc	Typical, output level = -10 dBm
Reverse Power	+30 dBm max.	
ConnectorType	N-type female	
Impedance	50 Ω	Nominal
Output VSWR	< 1.6:1	300 kHz ~ 3 GHz, source attenuation ≥ 12 dB

Note : The specifications apply when the GSP-9300B is powered on for at least 60 minutes to warm-up to a temperature of 20 ℃ to 30 ℃, unless specified otherwise.

ORDERING INFORMATION

GSP-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.02 GPIB Interface

OPTIONAL ACCESSORIES

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

FREE DOWNLOAD

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

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 Interface : LAN, USB, RS-232**
- **Options : Tracking Generator, GPIB Interface**

APPLICATIONS

- **For the Quick Check and Analysis of Spectral Characteristic**
- **Analyze AM, FM Signal Characteristics**
- **Monitor Satellite Uplink Signals From Satellite Uplink Truck**
- **Test Systems That Require a Very Compact Instrument**
- **Measure The Frequency Response of Cable, Attenuator, Filter and Amplifier**