

GSP-9300B



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 Resolution	9 kHz ~ 3 GHz 1 Hz	
FREQUENCY REFERENCE		
Accuracy Aging Rate Frequency Stability Over Temperature Supply Voltage Stability	$\pm(\text{period since last adjustment} \times \text{aging rate}) + \text{stability over temperature} + \text{supply voltage stability}$ $\pm 1 \text{ ppm max.}$ $\pm 0.025 \text{ ppm}$ $\pm 0.02 \text{ ppm}$	1 year after last adjustment 0 ~ 50 °C
FREQUENCY READOUT ACCURACY		
Start, Stop, Center, Marker Trace Points	$\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + 10\% \times \text{RBW} + \text{frequency resolution})$ Max. 601 points, Min. 6 points	
MARKER FREQUENCY COUNTER		
Resolution Accuracy	1 Hz, 10 Hz, 100 Hz, 1 kHz $\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + \text{counter resolution})$	RBW/Span ≥ 0.02 ; Mkr level to DNL >30 dB
FREQUENCY SPAN		
Range Resolution Accuracy	0 Hz (zero span), 100 Hz ~ 3 GHz 1 Hz \pm frequency resolution	RBW : Auto
PHASE NOISE		
Offset from Carrier 10 kHz 100 kHz 1 MHz	$< -88 \text{ dBc/Hz}$ $< -95 \text{ dBc/Hz}$ $< -113 \text{ dBc/Hz}$	$F_c=1\text{GHz}; \text{RBW}=1\text{kHz}, \text{VBW}=10\text{Hz}; \text{Average} \geq 40$ 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 $\pm 8\%$, RBW = 1MHz; $\pm 5\%$, RBW $< 1\text{MHz}$ $< 4.5 : 1$	-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	$\leq +33 \text{ dBm}$ $\pm 50 \text{ V}$	Input attenuator $\geq 10 \text{ dB}$
1 dB GAIN COMPRESSION		
Total Power at 1st Mixer Total Power at the Preamp	$> 0 \text{ dBm}$ $> -22 \text{ dBm}$	Typical; $F_c \geq 50 \text{ MHz}$; preamp. off Typical; $F_c \geq 50 \text{ MHz}$; preamp. on Mixer power level (dBm) = input power (dBm) – attenuation (dB)
DISPLAYED AVERAGE NOISE LEVEL (DANL)		
Preamp off 9 kHz~100 kHz 100 kHz~1 MHz 1 MHz~10 MHz 2.7 ~ 3.25 GHz Preamp on 100 kHz~1 MHz 1 MHz~10 MHz 10 MHz~3.25 GHz	0 dB attenuation; RF Input is terminated with a 50 Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = - 60 dBm; trace average ≥ 40 $< -93 \text{ dBm}$ $< -90 \text{ dBm} - 3 \times (f/100 \text{ kHz}) \text{ dB}$ $< -122 \text{ dBm}$ $< -116 \text{ dBm}$ 0 dB attenuation; RF Input is terminated with a 50 Ω load. RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = - 60 dBm; trace average ≥ 40 $< -108 \text{ dBm} - 3 \times (f/100 \text{ kHz}) \text{ dB}$ $< -142 \text{ dBm}$ $< -142 \text{ dBm} + 3 \times (f/1 \text{ GHz}) \text{ dB}$	Nominal Nominal Nominal Nominal 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 $\pm 5^\circ\text{C}$; Signal at Reference Level $\pm 0.5 \text{ dB}$ $\pm 0.6 \text{ dB}$	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 $\pm 0.5 \text{ dB}$ $\pm 0.7 \text{ dB}$ Attenuation: 0 dB; Reference: 160 MHz; 20 ~ 30°C $\pm 0.6 \text{ dB}$ $\pm 0.8 \text{ dB}$	
ATTENUATION SWITCHING UNCERTAINTY		
Attenuator Setting Uncertainty	0 ~ 50 dB in 1 dB step $\pm 0.25 \text{ dB}$	Reference : 160 MHz, 10dB attenuation
RBW FILTER SWITCHING UNCERTAINTY		
1 Hz ~ 1 MHz	$\pm 0.25 \text{ dB}$	Reference : 10 kHz RBW
LEVEL MEASUREMENT UNCERTAINTY		
Overall Amplitude Accuracy	$\pm 1.5 \text{ dB}$ $\pm 0.5 \text{ dB}$	20 ~ 30°C; frequency $> 1 \text{ MHz}$; 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

SPECIFICATIONS

SPURIOUS RESPONSE		
Second Harmonic Intercept	+35 dBm +60 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
Third-order Intercept	> 1dBm < -60 dBc <-90 dBm	
Input Related Spurious Residual Response (Inherent)		
SWEEP		
SWEEP TIME		
Range	204 μs ~ 1000 s 50 μs ~ 1000 s	Span > 0 Hz Span = 0 Hz; Min resolution = 10μs
Sweep Mode	Continuous; Single	
Trigger Source	Free run; Video; External	
Trigger Slope	Positive or negative edge	
RF PREAMPLIFIER		
Frequency Range	1 MHz ~ 3 GHz	Nominal (installed as standard)
Gain	18 dB	
FRONT PANEL INPUT/OUTPUT		
RF INPUT		
Connector Type	N-type female	Nominal 300 kHz ~ 3 GHz ; Input attenuator ≥ 10 dB
Impedance	50 Ω	
VSWR	<1.6 :1	
POWER FOR OPTION		
Connector Type	SMB male	With short-circuit protection
Voltage/Current	DC +7V/500 mA max	
USB HOST		
Connector Type	A plug	Support Full/High/Low speed
Protocol	Version 2.0	
MICRO SD SOCKET		
Protocol	SD 1.1	Up to 32GB capacity
Support Cards	Micro SD, Micro SDHC	
REAR PANEL INPUT/OUTPUT		
REFERENCE OUTPUT		
Connector Type	BNC female	Nominal
Output Frequency	10 MHz	
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 ± 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 Supports Full/High/Low speed
Protocol	Version 2.0	
IF OUTPUT		
Connector Type	SMA female	Nominal Nominal 10 dB attenuation; RF input : 0 dBm @ 1 GHz
Impedance	50 Ω	
IF Frequency	886 MHz	
Output Level	-25 dBm	
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	Operating Storage Inc. all options (Basic + TG + GPIB + Battery)
Power Consumption	< 65 W	
Warm-up Time	< 30 minutes	
Temperature Range	+5 °C ~ + 45 °C -20 °C ~ + 70 °C	
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	
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	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 ~ 30°C ± 1.5 dB ± 2 dB Referenced to -10 dBm Typical, output level = -10 dBm Nominal 300 kHz ~ 3 GHz, source attenuation ≥ 12 dB
Output Power	-50 dBm ~ 0 dBm in 0.5 dB steps	
Absolute Accuracy	± 0.5 dB	
Output Flatness	Referenced ~ 160 MHz, -10 dBm 100 kHz ~ 2 GHz 2 GHz ~ 3 GHz	
Output Level Switching Uncertainty	± 0.8 dB	
Harmonics	< -30 dBc	
Reverse Power	+30 dBm max.	
Connector Type	N-type female	
Impedance	50 Ω	
Output VSWR	< 1.6:1	

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

Specifications subject to change without notice. GSP-9300BGD1DH

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

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