

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, 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		
FREQUENCY		
Range	9 kHz to 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	± 1 ppm max.	1 year after last adjustment
Frequency Stability Over Temperature	± 0.025 ppm	0 °C to 50 °C
Supply Voltage Stability	± 0.02 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	601 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 to 3 GHz	
Resolution	1 Hz	
Accuracy	\pm frequency resolution *1	RBW : Auto
PHASE NOISE		
Offset From Carrier	Fc = 1 GHz; RBW = 1 kHz, VBW = 10 Hz; Average ≥ 40	
10 kHz	< -88 dBc/Hz	Typical *2
100 kHz	< -95 dBc/Hz	Typical
1 MHz	< -113 dBc/Hz	Typical
RESOLUTION BANDWIDTH (RBW) FILTER		
Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence 200 Hz, 9 kHz, 120 kHz, 1MHz	-3 dB bandwidth -6 dB bandwidth
Accuracy	$\pm 8\%$, RBW = 1 MHz; $\pm 5\%$, RBW < 1 MHz	Nominal *3
Shape Factor	< 4.5 : 1	Normal Bandwidth ratio: -60 dB : -3 dB
VIDEO BANDWIDTH (VBW) FILTER		
Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence	-3 dB bandwidth
[1] Frequency Resolution = Span/(Trace points - 1)		
[2] Typical specifications in this datasheet mean that the performance can be exhibited in 80% of the units with a 95% confidence level over the temperature range 20 to 30 °C. They are not covered by the product warranty.		
[3] Nominal values indicate expected performance. They are not covered by the product warranty.		
AMPLITUDE		
AMPLITUDE RANGE		
Measurement Range	100 kHz to 1 MHz 1 MHz to 10 MHz 10 MHz to 3 GHz	DANL to 18 dBm DANL to 21 dBm DANL to 30 dBm
ATTENUATOR		
Input Attenuator Range	0 dB to 50 dB, in 1 dB steps	Auto or manual setup
MAXIMUM SAFE INPUT LEVEL		
Average Total Power	$\leq +33$ 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
$\text{Mixer power level (dBm)} = \text{input power (dBm)} - \text{attenuation (dB)}$		
DISPLAYED AVERAGE NOISE LEVEL (DANL) *4		
Preamp Off	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	
9 kHz to 100 kHz	< -93 dBm	Nominal
100 kHz to 1 MHz	< -90 dBm - 3 x (f/100 kHz) dB	Nominal
1 MHz to 2.7 GHz	< -122 dBm	Nominal
2.7 GHz to 3 GHz	< -116 dBm	Nominal
Preamp on	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	
100 kHz to 1 MHz	< -108 dBm - 3 x (f/100 kHz) dB	Nominal
1 MHz to 10 MHz	< -142 dBm	Nominal
10 MHz to 3 GHz	< -142 dBm + 3 x (f/1 GHz) dB	Nominal
[4] DANL spec excludes spurious response.		
LEVEL DISPLAY RANGE		
Scales	Log, Linear	
Units	dBm, dBmV, dBuV, V, W	
Marker Level Readout	0.01 dB 0.01 % of reference level	Log scale 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)	Can be setup for each trace separately
Trace Functions	Clear & Write, Max/Min Hold, View, Blank, Average	
Absolute Point		
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 0 dBm; -30 dB RF attenuation

SPECIFICATIONS		
FREQUENCY RESPONSE		
Preamp Off 100 kHz to 2.0 GHz 2 GHz to 3 GHz	Attenuation : 10 dB; Reference: 160 MHz; 20 °C to 30 °C ± 0.5 dB ± 0.7 dB	
Preamp On 1 MHz to 2 GHz 2 GHz to 3 GHz	Attenuation: 0 dB; Reference: 160 MHz; 20 °C to 30 °C ± 0.6 dB ± 0.8 dB	
ATTENUATION SWITCHING UNCERTAINTY		
Attenuator Setting Uncertainty	0 dB to 50 dB in 1 dB step ± 0.25 dB	Reference : 160 MHz, 10 dB attenuation
RBW FILTER SWITCHING UNCERTAINTY		
1 Hz to 1 MHz	± 0.25 dB	Reference : 10 kHz RBW
LEVEL MEASUREMENT UNCERTAINTY		
Overall Amplitude Accuracy	± 1.5 dB ± 0.5 dB	20 °C to 30°C; frequency > 1 MHz; Signal input 0 dBm to -50 dBm; Reference level 0 dBm to -50 dBm; Input attenuation 10 dB; RBW 1 kHz; VBW 1 kHz; after cal; Preamp Off Typical
SPURIOUS RESPONSE		
Second Harmonic Intercept	Preamp off; signal input -30dBm; 0 dB attenuation +35 dBm +60 dBm	Typical; 10 MHz < fc < 775 MHz Typical; 775 MHz ≤ fc < 1.625 GHz
Third-order Intercept	Preamp off; signal input -30dBm; 0 dB attenuation > 1 dBm	300 MHz to 3 GHz Input signal level -30 dBm, Att. Mode, Att = 0 dB; 20 °C to 30 °C
Input Related Spurious	< -60 dBc	Input terminated; 0 dB attenuation; Preamp off
Residual Response (Inherent)	< -90 dBm	
SWEEP		
SWEEP TIME		
Range	204 μs to 1000 s 50 μs to 1000 s	Span > 0 Hz Span = 0 Hz; Min resolution=10 μs
Sweep Mode	Continuous; Single	
Trigger Source	Free run; Video; External	
Trigger Slope	Positive or negative edge	
RF PREAMPLIFIER		
Frequency Range	1 MHz to 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 to 3 GHz ; Input attenuator 10 dB
POWER FOR OPTION		
Connector Type	SMB male	
Voltage/Current	DC + 7 V/ 500 mA max	With short-circuit protection
USB HOST		
Connector Type	A plug	
Protocol	Version 2.0	Support Full/High/Low speed
MICROSD SOCKET		
Protocol	SD 1.1	
Support Cards	MicroSD, MicroSDHC	Up to 32 GB capacity
REAR PANEL INPUT/OUTPUT		
REFERENCE OUTPUT		
Connector Type	BNC female	
Output Frequency	10 MHz	Nominal
Output Amplitude	3.3 V CMOS	
Output Impedance	50 Ω	
REFERENCE INPUT		
Connector Type	BNC female	
Input Reference Frequency	10 MHz	
Input Amplitude	-5 dBm to +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	3.3 V CMOS	
Switch	Auto selection by function	
LAN TCP/IP INTERFACE		
Connector Type	RJ-45	
Base	10 Base-T; 100 Base-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	50 Ω	Nominal
IF Frequency	886 MHz	Nominal
Output Level	-25 dBm	10 dB attenuation; RF input : 0 dBm @ 1 GHz

SPECIFICATIONS		
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 to 240 V, 50 Hz or 60 Hz	Auto range selection
GENERAL		
Internal Data Storage	16 MB nominal	Operating Storage
Power Consumption	< 65 W	
Warm-up Time	< 30 minutes	Inc. all options (Basic + TG + GPIB)
Temperature Range	+5 °C to + 45 °C -20 °C to + 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) *5		
Frequency Range	100 kHz to 3 GHz	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 °C to 30 °C
Output Power	-50 dBm to 0 dBm in 0.5 dB steps	
Absolute Accuracy	± 0.5 dB	± 1.5 dB
Output Flatness	Referenced to 160 MHz, -10 dBm 100 kHz to 2 GHz 2 GHz to 3 GHz	
Output Level Switching Uncertainty	± 0.8 dB	± 2 dB
Harmonics	< -30 dBc	Referenced to -10 dBm
Reverse Power	+30 dBm max.	Typical, output level = -10 dBm
ConnectorType	N-type female	Nominal 300 kHz to 3 GHz, source attenuation ≥ 12 dB
Impedance	50 Ω	
Output VSWR	< 1.6 : 1	
[5] The minimum RBW filter is 10kHz when the TG output is ON.		
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-9300BGD2DH		
ORDERING INFORMATION		
GSP-9300B	3 GHz Spectrum Analyzer	
ACCESSORIES :		
Power Cord		
OPTION		
GSP-93T1	Tracking Generator (Factory installed option)	
GSP-93G1	GPIB Interface (Factory installed option)	
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 Preamp, 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

GKT-001 General Kit Set

Include :
ADP-002
ATN-100
GTL-303
GSC-002
For: GSP-Series



GKT-002 CATV Kit Set

Include :
ADP-001
ADP-101
GTL-304
GSC-003
For: GSP-Series



GKT-003 RLB Kit Set

Include :
GAK-001
GAK-002
GTL-302
GSC-004
For: GSP-Series



GSC-009 Soft Carrying Case

For: GSP-9330/9300B



GKT-008 EMI Probe Kit Set

Include :
ADP-002
GTL-303
PR-01
PR-02
ANT-04
ANT-05
For: GSP-Series



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