3GHz SPECTRUM ANALYZER

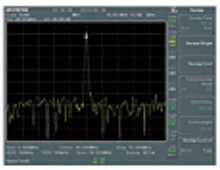
CE | USB | LXI | DVI Output | RS-232 | GPIB | PC Software

GSP-9300

FEATURES

- Frequency Range : 9kHz ~ 3GHz
- High Frequency Stability : 0.025ppm
- 3dB RBW : 1Hz ~ 1MHz
- 6dB EMI Filter : 200Hz, 9kHz, 120kHz, 1MHz
- Sweep Time up to 307us
- Phase Noise: -88dBc/Hz @1GHz, 10kHz Offset
- Built-in Measurement Functions : 2FSK Analysis, AM/FM/ASK/FSK Demodulation & Analysis, EMC Pre-test, 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 and Topographic Display Modes
- 886MHz IF Output for User's Extended Applications
- Remote Control Interface: LAN, USB, RS-232, GPIB (Optional)
- Built-in Preamplifier, 50dB Attenuator, and Sequence Function
- Optional 6.2GHz Power Sensor, Tracking Generator, Battery Pack

GSP-9300 is a light, compact, and high C/P ratio 3GHz spectrum analyzer. The GSP-9300 frequency range stretches from 9 KHz to 3GHz and features many functions such as radio frequency and power measurement, 2FSK digital communications analysis, EMC pretest mode, and active component P1dB point measurement, etc. It can support the fast sweep speed up to 307usec. GSP-9300 spectrum analyzer, with the built-in preamplifier and the highest sensitivity of -152dBm (1Hz), is capable of measuring very feeble signals. To obtain the accurate results, the low power measurement uncertainty of GSP-9300 is less than 1.5dB.



Fast Sweep Mode

GSP-9300 supports the fast sweep mode with sweep speed up to 307usec. Users can use the fast sweep mode to capture transient signals such as Tire-pressure monitoring system (TPMS), Bluetooth frequency hopping signals, tuned oscillator, and other interfering signals in ISM frequency band, etc

EMC Pretest Mode

EMC pretest mode is ideal for electromagnetic compatibility (EMC) test which is the preliminary stage of electronics product development. Users can identify and resolve problems at the early phase to avoid product revision after it was finalized. Hence, product development cycle and cost will be greatly reduced which is beneficial to saving cost and time for product entering the verification stage.

P1dB Point Measurement

All active components have linear dynamic range for power output. Once output power reaches the maximum level, active component will enter the non-linear saturated area of P1dB point and cease amplifying signal intensity as well as produce harmonic distortion. It is very useful for P1dB point measurement in active components such as low noise amplifier, mixer and active filter.

FSK Signal Demodulation & Analysis

ASK/FSK demodulation and analysis measures parameters including AM depth, frequency deviation, modulation rate, carrier power, carrier frequency offset, SINAD, symbol, and waveform. Users can set AM depth, frequency deviation, carrier power and carrier offset for Pass/Fail testing result.

2FSK Signal Analysis

2FSK modulation, for its features of low design cost and low electricity consumption, is widely used by RF communications applications with low power and low data transmission speed characteristics. Nowadays, 2FSK modulation technology has been applied in various products and systems such as consumer electronics, automotive electronics, RFID, auto reading electricity meter, and industrial control devices, etc.

Spectrogram

Spectrogram can simultaneously display power, frequency, and time. Frequency and power variation according to time changes can also be tracked. Especially, the intermittently appeared signals can be identified. Users, by using Spectrogram, can analyze the stability of signal versus time or identify the intermittently appeared interference signals in the communications system. Users can use two markers to find out the relation of power to frequency and time.

APPLICATIONS

- General Purpose Spectrum Analysis
- EMI Pre-compliance Testing
- Analyze ASK, FSK, AM, FM Signal Characteristics
- Satellite Monitoring In The Satellite Uplink Truck
- Test Systems That Require a Very Compact Instrument
- Measure The Frequency Response of Rf Components
- High Precise Power Measurement With External Power Sensor

GW INSTEK
Simply Reliable

SPECIFICATIONS

FREQUENCY

FREQUENCY

Range	9 kHz ~ 3.0 GHz	
Resolution	1 Hz	

FREQUENCY REFERENCE

Accuracy	±(period since last adjustment x aging rate)+stability over temperature+supply voltage stability	
Aging Rate	± 2 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*1	
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 *1	RBW : Auto

PHASE NOISE

Offset from Carrier		Fc=1GHz;RBW=1kHz,VBW=10Hz;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 ~ 1 MHz in 1-3-10 sequence	-3dB bandwidth
	200 Hz, 9 kHz, 120 kHz, 1MHz	-6dB bandwidth
Accuracy	± 8%, RBW = 1 MHz	Nominal *3
	± 5%, RBW < 1 MHz	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

*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 ~ 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 ~ 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)*4

*4 DANL spec shall exclude the Spurious Response.

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
10 MHz~3 GHz	< -122 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 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)	Can be setup for each traces separately
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; 20 ~ 30°C; signal input : 0 dBm	
Preamp off	± 0.3 dB	Ref level 0 dBm; 10 dB RF attenuation
Preamp on	± 0.4 dB	Ref level -30 dBm; 0 dB RF attenuation

SPECIFICATIONS

FREQUENCY RESPONSE		
Preamp off	Attenuation: 10 dB; Reference: 160 MHz; 20 ~ 30°C	
100 kHz ~ 2 GHz	± 0.5 dB	
2 GHz ~ 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 steps	
Uncertainty	± 0.15 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	± 1.5 dB	20 ~ 30°C; frequency >1MHz; signal input 0 ~ -50dBm; reference level 0 ~ -50dBm; Input attenuation 10dB; RBW 1kHz; VBW 1 kHz; after cal; Preamp off
Accuracy	± 0.5 dB	Typical
SPURIOUS RESPONSE		
Second Harmonic		Preamp off; signal input -30dBm; 0 dB attenuation
Intercept	+35 dBm	Typical : 10 MHz < fc < 775 MHz
	+60 dBm	Typical : 775 MHz ≤ fc < 1.5 GHz
Third-order		Preamp off; signal input -30dBm; 0 dB attenuation
Intercept	> 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	310 µs ~ 1000 s	Span > 0 Hz
	50 µs ~ 1000 s	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	
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 to 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	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
Protocol	Version 2.0	
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
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

SPECIFICATIONS

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 Voltage Capacity	6 cells, Li-Ion rechargeable, 3S2P DC 10.8 V 5200 mAh/56Wh	With UN38.3 Certification
GENERAL		
Monitor Display	8.4 inch TFT LCD. SVGA Resolution, 800 x 600 pixel	
Internal Data Storage	16 MB nominal	Nominal
Power Consumption	< 65 W	
Warm-up Time	< 30 minutes	
Temperature Range	+5 °C ~ + 45 °C -20 °C ~ + 70 °C	Operating Storage
Dimensions & Weight	350(W) x 213(H) x 105.7(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*5 (OPTIONAL)		*5 The minimum RBW filter is 10 kHz when the TG output is ON.
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 2 GHz ~ 3 GHz	 ± 1.5 dB ± 2 dB
Output Level Switching Uncertainty	± 0.8 dB	Referenced ~ -10 dBm
Harmonics	< -30 dBc	Typical, output level = -10 dBm
Reverse Power	+30 dBm max.	
Connector Type	N-type female	
Impedance	50 Ω	Nominal
Output VSWR	< 1.6 : 1	300 kHz ~ 3 GHz, source attenuation ≥ 12 dB
RF POWER SENSOR (OPTIONAL)		
Type	Average power sensor	Model: PWS-06
Interface to Meter	USB cable to GSP-9300 Front-Panel USB Host	
Connector Type	N-type male, 50 ohm nominal	
Input VSWR	1.1 : 1 1.3 : 1	Typical Max
Input Frequency	1 ~ 6200 MHz	
Sensing Level	-32 ~ +20 dBm	
Max. Input Damage Power	+ 27 dBm	
Power Measurement Uncertainty @25 °C	-30 dBm ~ +5 dBm: 1 MHz ~ 3GHz: ±0.10 dB typical 3 GHz ~ 6 GHz: ±0.15 dB typical +5 dBm ~ +12 dBm: 1 MHz ~ 3GHz: ±0.15 dB typical 3 GHz ~ 6 GHz: ±0.15 dB typical +12 dBm ~ +20 dBm: 1 MHz ~ 3GHz: ±0.20 dB typical 3 GHz ~ 6 GHz: ±0.20 dB typical	± 0.30 dB max. ± 0.30 dB max. ± 0.30 dB max. ± 0.30 dB max. ± 0.40 dB max. ± 0.40 dB max.
Power Measurement Uncertainty @0 ~ 25 °C	-30 dBm ~ +5 dBm: 1 MHz ~ 3GHz: ±0.25 dB typical 3 GHz ~ 6 GHz: ±0.25 dB typical +5 dBm ~ +12 dBm: 1 MHz ~ 3GHz: ±0.20 dB typical 3 GHz ~ 6 GHz: ±0.20 dB typical +12 dBm ~ +20 dBm: 1 MHz ~ 3GHz: ±0.35 dB typical 3 GHz ~ 6 GHz: ±0.30 dB typical	
Linearity @25 °C	±3 %	
Measurement Speed	100 ms for Low Noise Mode 30 ms for Fast Mode	Typical

Note : The specifications apply when GSP-930 is powered on for at least 30 minutes to warm-up to a temperature of 20°C~30°C, unless specified otherwise. Need to Collocate the Optional Accessories.

Specifications subject to change without notice. SP-9300GD1DH

ORDERING INFORMATION

GSP-9300 3GHz Spectrum Analyzer

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

OPTION

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

OPTIONAL ACCESSORIES

PWS-06	6.2GHz USB Power Sensor	**ADB-006**	DC Block N-TYPE 50Ω 10MHz~6GHz
GSC-009	Soft Carrying Case	**ADB-008**	DC Block SMA 50Ω 0.1MHz~8GHz
GRA-415	Rack Adapter Panel	**ADP-001**	BNC to N-TYPE Adaptor
ADB-002	DC Block BNC 50Ω 10MHz~2.2GHz	**ADP-002**	SMA to N-TYPE Adaptor

FREE DOWNLOAD

SpectrumShot PC Software for Windows System(available on GW Instek website)
GSP-9300 Remote Control APP for Android System(available on Google play)
IVI Driver Supports LabVIEW/LabWindows/CVI Programming(available on NI website)

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