



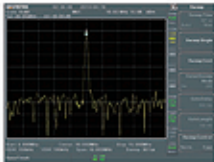
GSP-9300

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 Pre-amplifier, 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



SPECIFICATIONS

FREQUENCY

FREQUENCY

Range	9 kHz ~ 3.0 GHz
Resolution	1 Hz

FREQUENCY REFERENCE

Accuracy	$\pm(\text{period since last adjustment} \times \text{aging rate}) + \text{stability over temperature} + \text{supply voltage stability}$	1 year after last adjustment 0 ~ 50 °C
Aging Rate	$\pm 2 \text{ ppm max.}$	
Frequency Stability Over Temperature	$\pm 0.025 \text{ ppm}$	
Supply Voltage Stability	$\pm 0.02 \text{ ppm}$	

FREQUENCY READOUT ACCURACY

Start, Stop, Center, Marker Trace Points	$\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + 10\% \times \text{RBW} + \text{frequency resolution}^{\#1})$ Max. 601 points, Min. 6 points
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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
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FREQUENCY SPAN

Range Resolution Accuracy	0 Hz (zero span), 100 Hz ~ 3 GHz 1 Hz $\pm \text{frequency resolution}^{\#1}$	RBW : Auto
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PHASE NOISE

Offset from Carrier		$F_c = 1 \text{ GHz}; \text{RBW} = 1 \text{ kHz}; \text{VBW} = 10 \text{ Hz}; \text{Average} \geq 40$
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
Accuracy	200 Hz, 9 kHz, 120 kHz, 1 MHz $\pm 8\%$, RBW = 1 MHz $\pm 5\%$, RBW < 1 MHz	-6dB bandwidth Nominal ^{#3}
Shape Factor	< 4.5 : 1	Nominal Normal bandwidth ratio: -60dB : -3dB

VIDEO BANDWIDTH (VBW) FILTER

Filter Bandwidth	1 Hz ~ 1 MHz in 1-3-10 sequence	-3dB bandwidth
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^{#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 1 MHz ~ 10 MHz 10 MHz ~ 3 GHz	Displayed Average Noise Level(DANL) to 18 dBm DANL to 21 dBm DANL to 30 dBm
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ATTENUATOR

Input Attenuator Range	0 ~ 50 dB, in 1 dB steps	Auto or manual setup
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MAXIMUM SAFE INPUT LEVEL

Average Total Power DC Voltage	$\leq +33 \text{ dBm}$ $\pm 50 \text{ V}$	Input attenuator $\geq 10 \text{ dB}$
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1 dB GAIN COMPRESSION

Total Power at 1st Mixer Total Power at the Preamp	> 0 dBm > -22 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)
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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 50 Ω 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 50 Ω 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
Level Display Modes	0.01 % of reference level	Linear scale
Number of Traces	Trace, Topographic, Spectrogram	Single/Split Windows
Detector	4	
Trace Functions	Positive-peak, negative-peak, sample, normal, RMS(not Video) Clear & Write, Max/Min Hold, View, Blank, Average	Can be setup for each traces separately

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	$\pm 0.3 \text{ dB}$	Ref level 0 dBm; 10 dB RF attenuation
Preamp on	$\pm 0.4 \text{ dB}$	Ref level -30 dBm; 0 dB RF attenuation

SPECIFICATIONS

FREQUENCY RESPONSE		
Preamp off 100 kHz ~ 2 GHz 2 GHz ~ 3 GHz	Attenuation: 10 dB; Reference: 160 MHz; 20 ~ 30°C ± 0.5 dB ± 0.7 dB	
Preamp on 1 MHz ~ 2 GHz 2 GHz ~ 3 GHz	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 steps ± 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 Typical
Accuracy	± 0.5 dB	
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 < 1.5 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	
Input Related Spurious Residual Response (Inherent)	< -60 dBc < -90 dBm	
SWEEP		
SWEEP TIME		
Range	310 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 Gain	1 MHz ~ 3 GHz 18 dB	Nominal (installed as standard)
FRONT PANEL INPUT/OUTPUT		
RF INPUT		
Connector Type Impedance VSWR	N-type female 50 Ω <1.6 :1	Nominal 300 kHz to 3 GHz ; Input attenuator ≥ 10 dB
POWER FOR OPTION		
Connector Type Voltage/Current	SMB male DC +7V/500 mA max	With short-circuit protection
USB HOST		
Connector Type Protocol	A plug Version 2.0	Support Full/High/Low speed
MICRO SD SOCKET		
Protocol Support Cards	SD 1.1 Micro SD, Micro SDHC	Up to 32GB capacity
REAR PANEL INPUT/OUTPUT		
REFERENCE OUTPUT		
Connector Type Output Frequency Output Amplitude Output Impedance	BNC female 10 MHz 3.3V CMOS 50 Ω	Nominal
REFERENCE INPUT		
Connector Type Input Reference Frequency Input Amplitude Frequency Lock Range	BNC female 10 MHz -5 dBm ~ +10 dBm Within ± 5 ppm of the input reference frequency	
ALARM OUTPUT		
Connector Type	BNC female	Open-collector
TRIGGER INPUT/GATED SWEEP INPUT		
Connector Type Input Amplitude Switch	BNC female 3.3V CMOS Auto selection by function	
LAN TCP/IP INTERFACE		
Connector Type Base	RJ-45 10Base-T; 100Base-Tx; Auto-MDIX	
USB DEVICE		
Connector Type Protocol	B plug Version 2.0	For remote control only; supports USB TMC
IF OUTPUT		
Connector Type Impedance IF Frequency Output Level	SMA female 50Ω 886 MHz -25 dBm	Nominal Nominal 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 Internal Data Storage Power Consumption Warm-up Time Temperature Range	8.4 inch TFT LCD. SVGA Resolution, 800 x 600 pixel 16 MB nominal < 65 W < 30 minutes +5 °C ~ +45 °C -20 °C ~ +70 °C	Nominal Operating Storage Inc. all options (Basic + TG + GPIB + Battery)
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	
TRACKING GENERATOR*5 (OPTIONAL)		
*5 The minimum RBW filter is 10 kHz when the TG output is ON.		
Frequency Range Output Power Absolute Accuracy Output Flatness	100 kHz ~ 3 GHz -50 dBm ~ 0 dBm in 0.5 dB steps ± 0.5 dB Referenced ~ 160 MHz, -10 dBm 100 kHz ~ 2 GHz 2 GHz ~ 3 GHz	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 ~ 30°C ± 1.5 dB ± 2 dB Referenced ~ -10 dBm Typical, output level ~ -10 dBm
Output Level Switching Uncertainty Harmonics Reverse Power Connector Type Impedance Output VSWR	± 0.8 dB < -30 dBc +30 dBm max. N-type female 50 Ω < 1.6 : 1	Nominal 300 kHz ~ 3 GHz, source attenuation ≥ 12 dB
RF POWER SENSOR (OPTIONAL)		
Type Interface to Meter Connector Type Input VSWR	Average power sensor USB cable to GSP-9300 Front-Panel USB Host N-type male, 50 ohm nominal 1.1 : 1 1.3 : 1	Model: PWS-06 Typical Max
Input Frequency Sensing Level Max. Input Damage Power Power Measurement Uncertainty @25 °C	1 ~ 6200 MHz -32 ~ +20 dBm +27 dBm -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 Measurement Speed	±3 % 100 ms for Low Noise Mode 30 ms for Fast Mode	Typical

Note : The specifications apply when GSP-9300 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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