

Specifications

(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.)

Frequency			
Frequency	Range	9 kHz to 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 °C to 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 to 3 GHz	
	Resolution	1 Hz	
	Accuracy	± 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	-3dB bandwidth
		200 Hz, 9 kHz, 120 kHz, 1MHz	-6dB bandwidth
	Accuracy	± 8%, RBW = 1MHz	Nominal *3
		± 5%, RBW < 1MHz	Nominal
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 °C 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	Displayed Average Noise Level (DANL) to 18 dBm	
		1 MHz to 10 MHz	DANL to 21 dBm	
		10 MHz to 3 GHz	DANL to 30 dBm	
Attenuator	Input Attenuator Range	0 dB to 50 dB, in 1 dB step	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	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		
	1 MHz to 2.7 GHz	< -122 dBm		
	2.7 GHz to 3 GHz	< -116 dBm		
	Preamp on	0 dB attenuation; RF Input is terminated with a 50 Ω load; RBW 10 Hz; VBW 10Hz; 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		
10 MHz to 3 GHz	< -142 dBm + 3 x (f/1 GHz) dB			
Level Display Range	Scales	Log, Linear		
	Units	dBm, dBmV, dBμV, 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 trace 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; 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 -30 dBm; 0 dB RF attenuation
Frequency Response	Preamp off	Attenuation: 10 dB; Reference: 160 MHz; 20 to 30°C	
	100 kHz to 2.0 GHz	± 0.5 dB	
	2GHz to 3 GHz	± 0.7 dB	
	Preamp on	Attenuation: 0 dB; Reference: 160 MHz; 20 to 30°C	
	1 MHz to 2 GHz	± 0.6 dB	
	2 GHz to 3 GHz	± 0.8 dB	
Attenuation Switching Uncertainty	Attenuator setting	0 to 50 dB in 1 dB step	
	Uncertainty	± 0.25 dB	reference: 160 MHz, 10dB 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	20 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
		± 0.5 dB	Typical
Spurious Response	Second Harmonic Intercept		Preamp off; signal input -30 dBm; 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 -30 dBm; 0 dB attenuation
		> 1dBm	300 MHz to 3 GHz
	Input Related Spurious	< -60 dBc	Input signal level -30 dBm, Att. Mode, Att = 0 dB; 20 °C to 30 °C
Residual Response (inherent)	<-90 dBm	Input terminated; 0 dB attenuation; Preamp off	
[4] DANL spec excludes spurious response.			
Sweep			
Sweep Time	Range	204 μs to 1000 s	Span > 0 Hz
		50 μs to 1000 s	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 ohms	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	Supports Full/High/Low speed
MicroSD Socket	Protocol	SD 1.1	
	Supported 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 ohms	
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	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	50 ohms	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	
RS232 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 / 60 Hz (Auto range selection)	
General			
	Internal Data storage	16 MB nominal	
	Power Consumption	< 65 W	
	Warm-up Time	< 30 minutes	
	Temperature Range	+5 °C to +45 °C	Operating
		-20 °C to +70 °C	Storage
	Weight	4.5 kg (9.9 lb.)	Inc. all options (Basic + TG + GPIB + Battery)
	Dimensions	210 mm x 350 mm x 100 mm	Approximately
8.3 in x 13.8 in x 3.9 in			
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	
	Output Power	-50 dBm to 0 dBm in 0.5 dB steps	
	Absolute Accuracy	± 0.5 dB	@160 MHz, -10 dBm, Source attenuation 10 dB, 20 °C to 30°C
	Output Flatness	Referenced to 160 MHz, -10 dBm	
		100 kHz to 2 GHz	± 1.5 dB
		2 GHz to 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.	
	Connector type	N-type female	
Impedance	50 ohms	Nominal	
Output VSWR	< 1.6:1	300 kHz to 3 GHz, source attenuation ≥ 12 dB	
[5] The minimum RBW filter is 10 kHz when the TG output is ON.			