GSP-8000 Series

8.0GHz/3.8GHz/1.8GHz Spectrum Analyzer

FEATURES

- **Frequency Range**
  GSP-8800 : 9kHz ~ 8.0GHz
  GSP-8380 : 9kHz ~ 3.8GHz
  GSP-8180 : 9kHz ~ 1.8GHz
- **RBW: 1Hz ~ 1MHz in 1-3-5-10 steps**
- **VBW: 10Hz ~ 3MHz in 1-3-5-10 steps**
- **Phase Noise: -104 dBc/Hz**
- **Sensitivity: -160dBm/Hz Typical**
  @PreAmp On
- **Built-in AM/FM Demodulation**
- **Built-in Time Spec Function**
- **Measurement Function: ACPR/OCBW/CHPW,**
  NdB BW, Pass-Fail, Freq. Counter, Noise Marker
- **Built-in 20dB Preamplifier**
- **Communication Interface: LAN, USB Host/Device**
- **Display: 10.4" XGA Output (1024*768)**
- **Options: EMI Filter**

GW INSTEK
Simply Reliable

The GSP-8000 series, brand new general spectrum analyzers from GW Instek, features three frequency ranges, namely 8.0GHz, 3.8GHz and 1.8GHz. The series is suitable for teaching research, R&D verification, and the test requirements of radio frequency products during production and development stages. The series provides 1Hz ~ 1MHz resolution bandwidth (RBW), 10Hz ~ 3MHz video bandwidth (VBW), -104dBc/Hz phase noise, a 20dB preamplifier, and the lowest noise floor of -160dBm/Hz (typical).

With respect to measurement applications, GSP-8000 has built-in Time Spec function, AM/FM signal demodulation function, channel test (Channel Power Measurement) function, Pass-Mail function, etc. The Time Spec function can simultaneously observe and display the correlation between power, frequency and time. ACPR/OCBW/CHPW tests can be used to test adjacent channels, power occupation bandwidth ratio, and channel power. The Pass-Fail function can be used to determine whether the signal is within the set range. Users can use these functions to conduct a wide range of measurement applications.

GSP-8000 utilizes a 10.4-inch TFT LCD large-size screen with XGA (1024*768) resolution to allow an easy observation of test signals. For communication interface, GSP-8000 provides two interfaces: USB and LAN. Through the USB Host, users can quickly retrieve the files stored after measurements, while USB Device and LAN interface allow users to control the instrument through dedicated PC software, or use the corresponding command set to design the required program.

GSP-8000 provides EMI filter option. Customers can be activated through the corresponding software authorization (Soft-Key), which greatly improves usage efficiency.

A. BROAD TEST AND MEASUREMENT RANGE

| Model		Competitor	
GSP-8800	8.0GHz	Rigol DSA875	7.5GHz
		Siglent SSA3075X-Plus	7.5GHz
GSP-8380	3.8GHz	Rigol DSA832E	3.2GHz
		Siglent SSA3032X	3.2GHz
GSP-8180	1.8GHz	Rigol DSA815	1.5GHz
		Rigol RSA3015E	1.5GHz

Whether it is a 1.8GHz, a 3.8GHz or an 8.0GHz model, the test and measurement bandwidth is wider than that of competitors at the same category.

B. RICH ANALYTICAL BANDWIDTH
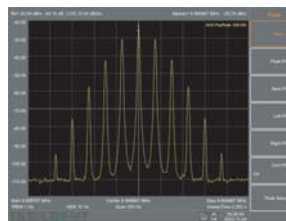
GSP-8000 provides RBW from 1Hz to 1MHz, and provides 1-3-5-10 Sequence stages, allowing users to observe the signal in more detail.

C. TIME SPEC
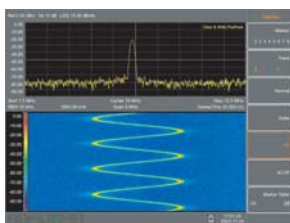
This function can simultaneously view and display the relationship between power, frequency and time, and can track changes in frequency and power over time.

D. TRACE & DETECTOR

GSP-8000 provides five traces of different colors, among which Trace1 is displayed in yellow, Trace 2 is fuchsia, Trace 3 is azure, Trace 4 is orange, and Trace 5 is green. Users can collocate the required Detector for test and measurement.The Detector function provides Pos Peak, Neg Peak, Sample, Normal, Voltage Avg, RMS Avg and Quasi-Peak functions. The Quasi-Peak function can only be used after the EMI option is turned on.

E.   PEAK SEARCH & MARKER FUNCTION

In addition to the functions related to Max Peak, the Peak Search function provides a new settable search for Min Peak. Users can set whether to search for Max Peak or Min Peak.

GSP-8000 provides up to 8 Markers for simultaneous display, and Markers can be assigned to different Traces. It also provides three application functions: N-dB, Marker Noise and Frequency Counter.1kHz, 100Hz, 10Hz and the most accurate resolution of 1Hz.

* N-dB: N-dB: It can measure the bandwidth when the left and right sides of the Marker value decrease by N-dB respectively.
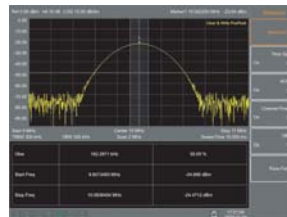
* Marker Noise: Marker Noise: The current Marker frequency reading can be converted into the dBm/Hz absolute power reading at 1Hz RBW.

* Frequency Counter: Frequency Counter: Users can set the counter to 1kHz, 100Hz, 10Hz and the most accurate resolution of 1Hz.
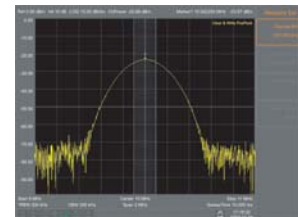
F.   ACPR, OCBW, CHPW
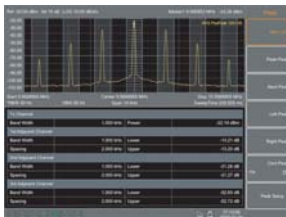

ACPR

OCBW

CHPW

Adjacent Channel Power Ratio (ACPR) measurement can check the power of the signal and adjacent channels, which helps to understand the power value between channels. The ACPR function can set up to three groups of adjacent channel tests.

Occupied Bandwidth (OCBW) measurement can simultaneously display the occupied bandwidth, channel power and power spectrum density.

Channel Power (OCBW) is used to measure the power strength of a signal in a user-defined channel.
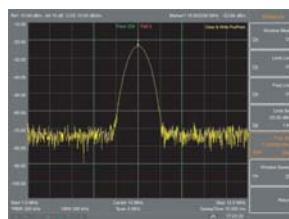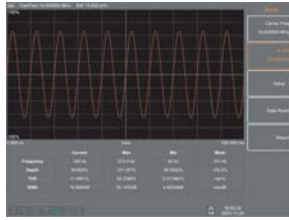
G.   LIMIT LINE
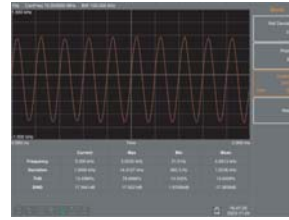

Windows Measure
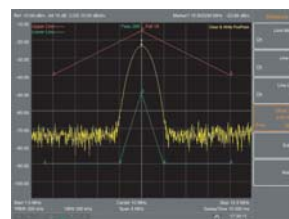
Limit Measure

Provides two Limit Line measurement functions, namely Windows Measure and Limit Measure. Determine whether the measured signal is qualified through the set conditions.

AM Analysis

FM Analysis

AM/FM signal analysis measurement parameters, such as amplitude modulation depth (Depth) or frequency deviation (Deviation), distortion (THD) and signal-to-noise and distortion ratio (SINAD), and supports demodulated audio source output.

I. HELP FUNCTION
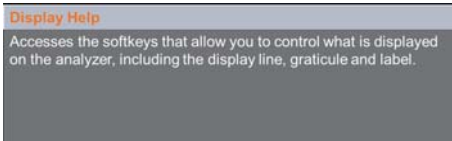
When the Help function is turned on, users can learn about the introduction or usage of each key or function, speeding up the user's understanding and familiarity with the functions.

J. LARGE SCREEN

Provides a large 10.4" TFT LCD with a resolution of 1024*768 (XGA), making it easier for users to observe the details of waveforms.

K. ICON STATUS

There are two areas in the icon status. The area in the lower left corner is mainly for the function settings of the instrument, while the area at the lower right corner is the usage of the communication interface, allowing users to easily understand the status and results of the instrument.

L. COMMUNICATION INTERFACE

Provides USB Host and LAN interfaces, and supports the command set that complies with the IEEE488.2 commands to facilitate users in the control of the instrument.

M. DEDICATED PC SOFTWARE
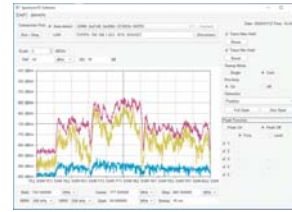
GSP-8000 has dedicated PC software that can be controlled directly through the computer's USB or LAN interface.

In addition to basic Span, Amplitude, BW settings, the PC software also provides more commonly used functions such as Max/Min Trace, Detector and Peak On/Off.

PANEL INTRODUCTION

1. TFT LCD
2. F1~F7 Menu Soft Keys
3. Function Keys
4. Numeric Keypad, Knob, Unit Keys
5. RF Input
6. TG Output
7. Earphone
8. USB Host
9. Power Key
10. AC Power Input (On the Side)
11. LAN Interface
12. USB Device Interface
13. REF. In/Out Interface
14. Trig-in Interface
15. Anti-theft Hole

SPECIFICATIONS

Mode	GSP-8180	GSP-8380	GSP-8800

FREQUENCY

FREQUENCY

Range	9 kHz ~ 1.8 GHz	9 kHz ~ 3.8 GHz	9 kHz ~ 8.0 GHz
Resolution	1 Hz		

FREQUENCY SPAN

Frequency Range	0 Hz, 100 Hz to max. frequency of instrument
Span Uncertainty	±span / (sweep points-1)

INTERNAL FREQUENCY REFERENCE

Frequency Range	10.000000 MHz
Reference Frequency Accuracy	±[(days from last calibrate × freq aging rate) + temperature stability + initial accuracy]
Temperature Stability	<1ppm, 15°C ~ 35°C
Aging Rate	<1ppm/year
Initial Accuracy	< 1ppm

SSB PHASE NOISE

Offset From Carrier	fc = 1 GHz, RBW = 1 kHz, VBW = 1kHz, 20°C ~ 30°C, average ≥ 40
10 kHz	< -104 dBc/Hz
100 kHz	< -106 dBc/Hz, Typical
1 MHz	< -115 dBc/Hz, Typical

BANDWIDTH

Resolution Bandwidth	1Hz to 1MHz (1-3-5-10 steps by sequence) ; EMI Filter(6dB): 200Hz, 9kHz, 120kHz, 1MHz (Optional)
RBW Uncertainty	< 5%, Typical, RBW ≤ 1 MHz
Resolution Filter Shape Factor (60 dB: 3	< 5: 1, Typical, digital and close to Gaussian shape
Video Bandwidth (VBW)	10 Hz ~ 3 MHz

AMPLITUDE

AMPLITUDE AND LEVEL

	GSP-8180		GSP-8380		GSP-8800	
Amplitude Measurement Range	DANL ~ +10 dBm	100 kHz ~ 1 MHz, Preamp Off	DANL ~ +10 dBm	100 kHz ~ 1 MHz, Preamp Off	DANL ~ +10 dBm	100 kHz ~ 10 MHz, Preamp Off
	DANL ~ +20 dBm	1 MHz ~ 1.8 GHz, Preamp Off	DANL ~ +20 dBm	1 MHz ~ 3.8 GHz, Preamp Off	DANL ~ +20 dBm	10 MHz ~ 8 GHz, Preamp Off
Reference Level	-80 dBm ~ +30 dBm, 0.01dB by step					
Preamp	20 dB, 100 kHz ~ Max. Frequency Range					
Input Attenuation	0 ~ 40 dB, in 1 dB step					
Max Input DC Voltage	50 VDC					
Max Continuous Power	+30dBm, Average continuous power					

Displayed Average Noise Level (DANL)

Input Attenuation = 0 dB, ref. level ≥ -60dBm, trace average ≥ 40, RBW normalizes to 1Hz, DETECTOR = SAMPLE, RBW = 100Hz, VBW = 100Hz

Preamp Off	GSP-8180		GSP-8380		GSP-8800	
	9 kHz ~ 1MHz	<-95 dBm (typical), <-88dBm	9 kHz ~ 1MHz	<-95 dBm (typical), <-88dBm	9 kHz ~ 1MHz	-95dBm (typical), <-88 dBm
	1 MHz ~ 1 GHz	<-140dBm (typical), <-130 dBm	1 MHz ~ 1 GHz	<-140dBm (typical), <-130 dBm	1 MHz ~ 500MHz	-140dBm (typical), <-130 dBm
	1 GHz ~ 1.8 GHz	<-138dBm (typical), <-128 dBm	1 GHz ~ 3.8 GHz	<-138dBm (typical), <-128 dBm	500MHz ~ 3GHz	-138dBm (typical), <-128 dBm
					3GHz ~ 6GHz	-134dBm (typical), <-124 dBm
					6GHz ~ 8GHz	-129dBm (typical), <-119dBm

Input Attenuation = 0 dB, ref. level ≥ -60dBm, trace average ≥ 40, RBW normalizes to 1Hz, DETECTOR = SAMPLE, RBW = 100Hz, VBW = 100Hz

Preamp On	GSP-8180		GSP-8380		GSP-8800	
	100 kHz ~ 1MHz	<-135 (typical), <-128dBm	100 kHz ~ 1MHz	<-135 dBm (typical), <-128dBm	100 kHz ~ 1MHz	-135dBm (typical), <-128 dBm
	1 MHz ~ 1 GHz	<-160dBm (typical), <-150 dBm	1 MHz ~ 1 GHz	<-160dBm (typical), <-150 dBm	1 MHz ~ 500MHz	-160dBm (typical), <-150 dBm
	1 GHz ~ 1.8 GHz	<-160dBm (typical), <-150 dBm	1 GHz ~ 3.8 GHz	<-160dBm (typical), <-150 dBm	500MHz ~ 3GHz	-160dBm (typical), <-150 dBm
					3GHz ~ 6GHz	-154dBm (typical), <144 dBm
					6GHz ~ 8GHz	-149dBm (typical), <-139dBm

FREQUENCY RESPONSE

Filter Bandwidth	20°C to 30°C, 30% to 70% relative humidity, input attenuation = 10 dB, reference frequency = 50 MHz, SPAN = 200KHz, RBW = 10KHz, VBW = 10KHz
Preamp Off, fc ≥100 kHz	±0.8 dB, 100K ~ Max. Frequency Range
Preamp On, fc ≥1MHz	±0.9 dB, 100K ~ Max. Frequency Range

UNCERTAINTY AND ACCURACY

RBW Switch Uncertainty	Reference: 10 kHz RBW at Frequency Center is 50 MHz ; ±0.2 dB, Log resolution
Input Attenuation Uncertainty	20°C ~30°C, fc = 50 MHz, Preamplifier Off, 10 dB RF attenuation, RBW = 10K ; 1 ~ 40 dB ±0.5 dB
Absolute Amplitude Uncertainty	20°C to 30°C, fc = 50 MHz, Span = 200 kHz, RBW = 10 kHz, VBW=10 kHz, peak detector, 10 dB RF attenuation, average ≥ 20, 2db/div, 95% confidence level
Preamp Off	±0.4 dB, input signal level -20 dBm
Preamp On	±0.5 dB, input signal level -40 dBm
Uncertainty	20°C to 30°C, fc ≥ 1MHz, signal input range 0 ~ -50dBm, Ref Level range 0 ~ -50dBm, 10 dB RF attenuation, RBW = 1kHz, VBW = 1kHz, Preamp Off
	±1.5 dB(typical)
VSWR	<1.5, Nominal, Input 10 dB RF attenuation, 1MHz ~ 1.8GHz / 3.8GHz / <1.8, Nominal, Input 20 dB RF attenuation, 1MHz ~ 8GHz

DISTORTION AND SPURIOUS RESPONSE

Second Harmonic Distortion	fc ≥ 50 MHz, Preamp off, signal input -20 dBm, 0 dB RF attenuation, 20°C ~ 30°C ; -65 dBc
Third-order Intermodulation	fc ≥ 50 MHz, Input double tone level -20 dBm, frequency interval 100 kHz, input attenuation 0 dB, preamplifier off, 20°C ~ 30°C ; +10 dBm
1 dB Gain Compression	Nominal, fc ≥ 50 MHz, 0 dB RF attenuation, Preamp off, 20°C ~ 30°C ; > -2 dBm
Residual Response	Connect 50 Ω load at input port, 0 dB input attenuation, 20°C to 30°C, average ≥ 40, RBW = 300Hz, VBW = 3kHz, SPAN = 2M
	<-85 dBm, from 1 MHz ~ Max. Frequency Range
Input Related Spurious	<-60 dBc, -30 dBm signal at input mixer, 20°C ~ 30°C

SWEEP

Sweep Time

Range	10 ms ~ 3000 s, None-zero Span ; 1 ms ~ 3000 s, Zero Span
Sweep Mode	Continuous; Single

TRACKING GENERATOR (OPTION 01)

Tracking Generator Output

Frequency Range	100 kHz ~ Max. Frequency Range
Output Power Level Range	-40 dBm ~ 0 dBm
Output Power Level Resolution	1 dB
Output Flatness	± 3 dB
Maximum Safe Reverse Level	Average total power: +30 dBm, DC : ±50 VDC
Impedance	50 Ω, Nominal
Connector	N Type Female

FREQUENCY COUNTER

Frequency Counter

Resolution	1Hz, 10Hz, 100Hz, 1kHz
Accuracy	±(frequency indication × frequency reference accuracy) + counter resolution

INPUTS AND OUTPUTS

RF Input

Impedance	50 Ω, Nominal
Connector	N Type Female

Reference Input

Connector	BNC Female
10MHz Reference Amplitude	0 dBm to +10 dBm

Trigger Input

Impedance	1 kΩ
10MHz Reference Amplitude	BNC Female

USB

USB Host	Connector: A Plug, Protocol: USB 2.0 (Host End)
USB Device	Connector: B Plug, Protocol: 2.0 Version

GENERAL

Display	10.4" TFT LCD, Resolution: 1024*768, Color: 65,536 colors
Remote Control	USB Device: B Plug, supports USB TMC ; LAN TCP/IP Interface : RJ-45, supports 10Base-T/100Base-Tx
Mass Memory	Internal Memory: 256M Bytes
Temperature	Operating Temperature: 0 °C to 40°C ; Storage Temperature: -20°C to 70°C
Relative Humidity	0℃ to 30℃ : ≤ 95% ; 30℃ to 40℃ : ≤ 75%
Power Consumption	28W
Dimensions & Weight	421(W) × 221(H) × 115(D) mm; Approx. 5.0 kg (without package)
AC Power Socket	100V ~ 240V, 50/60Hz

The specifications apply when the function generator is powered on for at least 30 minutes under +20℃~+30℃.   Specifications subject to change without notice.   GSP-8000_E_GD1BH

ORDERING INFORMATION

GSP-8800	8.0GHz Spectrum Analyzer
GSP-8800(TG)	8.0GHz Spectrum Analyzer with TG
GSP-8380(TG)	3.8GHz Spectrum Analyzer with TG
GSP-8180(TG)	1.8GHz Spectrum Analyzer with TG

ACCESSORIES
Power Cord, Safety Guide, USB Cable

OPTIONAL ACCESSORIES

GSP-8800E1	EMI Activation Option for GSP-8800	ADP-001	N(M)-BNC(F) Adapter
GSP-8380E1	EMI Activation Option for GSP-8380	ADP-002	N(M)-SMA(F) Adapter
GSP-8180E1	EMI Activation Option for GSP-8180	GTL-301	N(M)-N(M) RF Cable
		GTL-303	SMA(M)-SMA(M) RF Cable

GW INSTEK

Simply Reliable