



# 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.

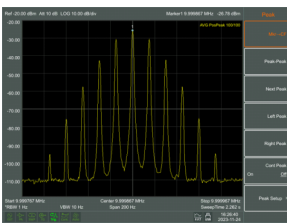
GSP-8000 utilizes a 10.4-inch TFT LCD large-size screen with XGA (1024\*768) resolution to allow an easy observation of test signals. For communication interface, GSP-8000 provides two interfaces: USB and LAN. Through the USB Host, users can quickly retrieve the files stored after measurements, while 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**

**B. RICH ANALYTICAL BANDWIDTH**

| 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 |

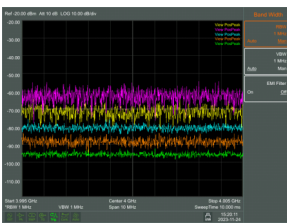
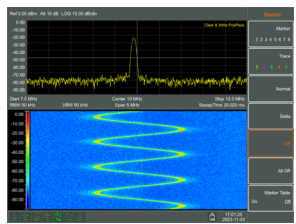


Whether it is a 1.8GHz, a 3.8GHz or an 8.0GHz model, the test and measurement bandwidth is wider than that of competitors at the same category.

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**

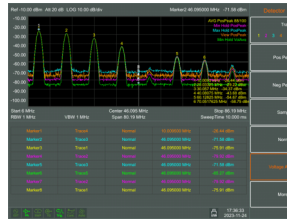
**D. TRACE & DETECTOR**



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

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.

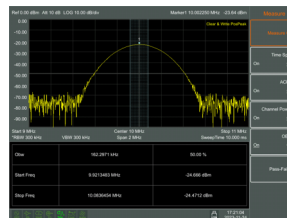
\* Marker Noise: Marker Noise: The current Marker frequency reading can be converted into the dBm/Hz absolute power reading at 1Hz RBW.

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

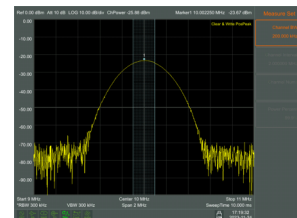
## F. ACPR, OCBW, CHPW



ACPR



OCBW



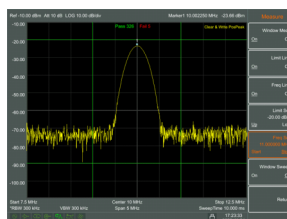
CHPW

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.

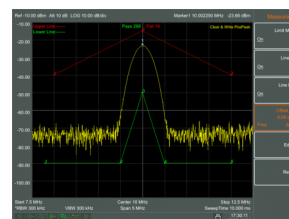
Channel Power (OCBW) is used to measure the power strength of a signal in a user-defined channel.

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

## G. LIMIT LINE



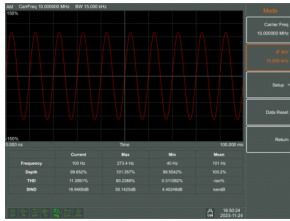
Windows Measure



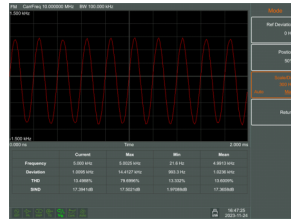
Limit Measure

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

## H. AM AND FM SIGNAL DEMODULATION



AM Analysis



FM Analysis

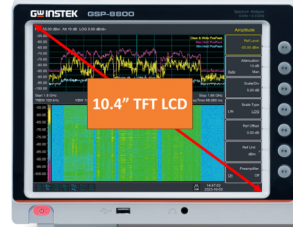
AM/FM signal analysis measurement parameters, such as amplitude modulation depth (Depth) or frequency deviation (Deviation), distortion (THD) and signal-to-noise and distortion ratio (SINAD), and supports demodulated audio source output.

## I. HELP FUNCTION

**Display Help**  
 Accesses the softkeys that allow you to control what is displayed on the analyzer, including the display line, graticule and label.

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                     |                              |
| <b>FREQUENCY</b>                                       |   |                               |                 |                               |                              |                              |
| <b>FREQUENCY</b>                                       |   |                               |                 |                               |                              |                              |
| Range  | 9 kHz ~ 1.8 GHz   |                               | 9 kHz ~ 3.8 GHz |                               | 9 kHz ~ 8.0 GHz              |                              |
| Resolution   | 1 Hz  |                               |                 |                               |                              |                              |
| <b>FREQUENCY SPAN</b>                                  |   |                               |                 |                               |                              |                              |
| Frequency Range  | 0 Hz, 100 Hz to max. frequency of instrument  |                               |                 |                               |                              |                              |
| Span Uncertainty                                       | ±span / (sweep points-1)  |                               |                 |                               |                              |                              |
| <b>INTERNAL FREQUENCY REFERENCE</b>                    |   |                               |                 |                               |                              |                              |
| Frequency Range  | 10,000,000 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   |                               |                 |                               |                              |                              |
| <b>SSB PHASE NOISE</b>                                 |   |                               |                 |                               |                              |                              |
| 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  |                               |                 |                               |                              |                              |
| <b>BANDWIDTH</b>                                       |   |                               |                 |                               |                              |                              |
| 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   |                               |                 |                               |                              |                              |
| <b>AMPLITUDE</b>                                       |   |                               |                 |                               |                              |                              |
| <b>AMPLITUDE AND LEVEL</b>                             |   |                               |                 |                               |                              |                              |
| 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  |                               |                 |                               |                              |                              |
| <b>Displayed Average Noise Level (DANL)</b>            |   |                               |                 |                               |                              |                              |
| Preamp Off   | Input Attenuation = 0 dB, ref. level ≥ -60dBm, trace average ≥ 40, RBW normalizes to 1Hz, DETECTOR = SAMPLE, RBW = 100Hz, VBW = 100Hz                   |                               |                 |                               |                              |                              |
|  | 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 |
| Preamp On  | Input Attenuation = 0 dB, ref. level ≥ -60dBm, trace average ≥ 40, RBW normalizes to 1Hz, DETECTOR = SAMPLE, RBW = 100Hz, VBW = 100Hz                   |                               |                 |                               |                              |                              |
|  | 100 kHz ~ 1MHz  | <-135 dBm (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                   | -129dBm (typical), <-119dBm  |                              |
| <b>FREQUENCY RESPONSE</b>                              |   |                               |                 |                               |                              |                              |
| 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  |                               |                 |                               |                              |                              |
| <b>UNCERTAINTY AND ACCURACY</b>                        |   |                               |                 |                               |                              |                              |
| 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, Preamp 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 |   |                               |                 |                               |                              |                              |
| <b>DISTORTION AND SPURIOUS RESPONSE</b>                |   |                               |                 |                               |                              |                              |
| 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, preamp 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                                 |                               |                 |                               |                              |                              |
| Input Related Spurious                                 | <-85 dBm, from 1 MHz ~ Max. Frequency Range   |                               |                 |                               |                              |                              |
|  | <-60 dBc, -30 dBm signal at input mixer, 20°C ~ 30°C  |                               |                 |                               |                              |                              |
| <b>SWEEP</b>   |   |                               |                 |                               |                              |                              |
| <b>Sweep Time</b>                                      |   |                               |                 |                               |                              |                              |
| Range  | 10 ms ~ 3000 s, None-zero Span ; 1 ms ~ 3000 s, Zero Span   |                               |                 |                               |                              |                              |
| Sweep Mode   | Continuous; Single  |                               |                 |                               |                              |                              |
| <b>TRACKING GENERATOR (OPTION 01)</b>                  |   |                               |                 |                               |                              |                              |
| <b>Tracking Generator Output</b>                       |   |                               |                 |                               |                              |                              |
| 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   |                               |                 |                               |                              |                              |
| <b>FREQUENCY COUNTER</b>                               |   |                               |                 |                               |                              |                              |
| <b>Frequency Counter</b>                               |   |                               |                 |                               |                              |                              |
| Resolution   | 1Hz, 10Hz, 100Hz, 1kHz  |                               |                 |                               |                              |                              |
| Accuracy   | ±(frequency indication × frequency reference accuracy) + counter resolution   |                               |                 |                               |                              |                              |
| <b>INPUTS AND OUTPUTS</b>                              |   |                               |                 |                               |                              |                              |
| <b>RF Input</b>  |   |                               |                 |                               |                              |                              |
| Impedance  | 50 Ω, Nominal   |                               |                 |                               |                              |                              |
| Connector  | N Type Female   |                               |                 |                               |                              |                              |
| <b>Reference Input</b>                                 |   |                               |                 |                               |                              |                              |
| Connector  | BNC Female  |                               |                 |                               |                              |                              |
| 10MHz Reference Amplitude                              | 0 dBm to +10 dBm  |                               |                 |                               |                              |                              |
| <b>Trigger Input</b>                                   |   |                               |                 |                               |                              |                              |
| Impedance  | 1 kΩ  |                               |                 |                               |                              |                              |
| 10MHz Reference Amplitude                              | BNC Female  |                               |                 |                               |                              |                              |
| <b>USB</b>   |   |                               |                 |                               |                              |                              |
| USB Host   | Connector: A Plug, Protocol: USB 2.0 (Host End)   |                               |                 |                               |                              |                              |
| USB Device   | Connector: B Plug, Protocol: 2.0 Version  |                               |                 |                               |                              |                              |
| <b>GENERAL</b>   |   |                               |                 |                               |                              |                              |
| 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 °C to 30 °C : ≤ 95% ; 30 °C to 40 °C : ≤ 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°C~+30°C.

Specifications subject to change without notice. GSP-8000\_E\_GD1BH

| ORDERING INFORMATION                |                                  | OPTIONAL ACCESSORIES |                                    |
|-------------------------------------|----------------------------------|----------------------|------------------------------------|
| GSP-8800                            | 8.0GHz Spectrum Analyzer         | GSP-8800E1           | EMI Activation Option for GSP-8800 |
| GSP-8800(TG)                        | 8.0GHz Spectrum Analyzer with TG | GSP-8380E1           | EMI Activation Option for GSP-8380 |
| GSP-8380(TG)                        | 3.8GHz Spectrum Analyzer with TG | GSP-8380E1           | EMI Activation Option for GSP-8180 |
| GSP-8180(TG)                        | 1.8GHz Spectrum Analyzer with TG |                      |                                    |
| <b>ACCESSORIES</b>                  |                                  | ADP-001              | N(M)-BNC(F) Adapter                |
| Power Cord, Safety Guide, USB Cable |                                  | ADP-002              | N(M)-SMA(F) Adapter                |
|                                     |                                  | GTL-301              | N(M)-N(M) RF Cable                 |
|                                     |                                  | GTL-303              | SMA(M)-SMA(M) RF Cable             |

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