



# GSP-9300

## 3GHz Spectrum Analyzer

### 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

**GW INSTEK**  
Simply Reliable

# 3GHz Spectrum Analyzer



## GSP-9300



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. It is the ideal instrument for various application fields such as the basic operation of R&D, research and school lecture, engineering maintenance, and test for mass production. This light and compact spectrum analyzer is also suitable for automatic test systems and vehicle mounted operation.

GW Instek understands that high quality is a very important consideration for users who are selecting economical spectrum analyzers. 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.

The built-in measurement functions of GSP-9300 spectrum analyzer include 2FSK digital communications analysis, AM/FM/ASK/FSK signal demodulation & analysis, EMC pretest mode, Harmonic Distortion, TOI, Channel Power, OCBW, ACPR, SEM, Phase Jitter, N-dB Bandwidth, Noise Marker, Frequency Counter, and Time Domain power measurement for burst signal, etc.

Tracking generator, an option for GSP-9300 spectrum analyzer, provides supplementary functions such as measuring the insertion loss of RF cable and identifying the frequency response of antenna, filter or amplifier. The P1dB measurement function supports power sweep and P1dB compression point of active component's. It supports 6.2GHz power sensor PWS-06. Users, via the power meter mode, can conduct related measurement applications without using an independent power meter.

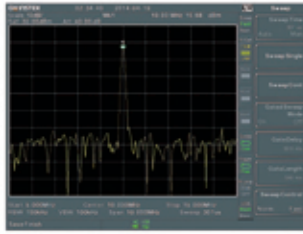
GSP-9300 spectrum analyzer is very user-friendly. All frequently used functions can be applied quickly through function keys and five languages (English, Russian, Traditional Chinese, Simplified Chinese and Japanese) are available for user interface.

Users can use the external software SpectrumShot for EMI test report management and assessment, remote control and waveform data recording for long periods of time. SpectrumShot can be applied to spectrum monitoring for detecting any abnormal radio signals. The software will send out e-mail to inform users if any abnormal situation occurs.

To summarize, GSP-9300 spectrum analyzer is a perfect, light, compact, and economical measurement instrument. With height of 210mm and width of 350mm, GSP-9300 is suitable for automatic test systems. It can be mounted on the 19 inches 6U rack. The light and compact design of GSP-9300 is ideal for vehicle mounted operation to carry out field strength measurement such as monitoring satellite communications signals.

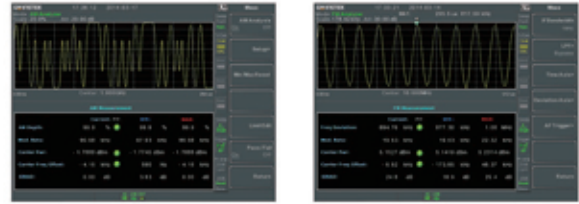
## MEASUREMENT FUNCTION KEY FEATURES

### A. FAST SWEEP MODE



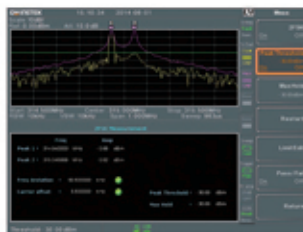
GSP-9300 supports the fast sweep mode with sweep speed up to 307usec. Users can use the fast sweep mode to capture transient signals such as Tire-pressure monitoring system (TPMS), Bluetooth frequency hopping signals, tuned oscillator, and other interfering signals in ISM frequency band, etc.

### B. AM/FM SIGNAL DEMODULATION & ANALYSIS



AM/FM Signal Analysis measures parameters including AM depth, frequency deviation, modulation rate, carrier power, carrier frequency offset and SINAD. Users can set the criterion in AM depth, frequency deviation, carrier power and carrier offset for fast test result determination. The GSP-9300 has a convenient AM/FM demodulation function to tune into AM or FM broadcast signals and listen to the demodulated baseband signals using the ear phone out socket.

### C. 2FSK SIGNAL ANALYSIS



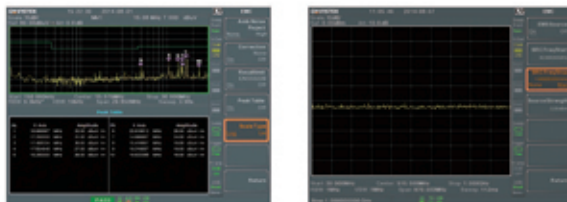
2FSK modulation, for its features of low design cost and low electricity consumption, is widely used by RF communications applications with low power and low data transmission speed characteristics. Nowadays, 2FSK modulation technology has been applied in various products and systems such as consumer electronics, automotive electronics, RFID, auto reading electricity meter, and industrial control devices, etc. 2FSK signal analysis measures parameters including carrier power, FSK frequency deviation, carrier frequency, and carrier frequency offset. Users can set the criterion in frequency deviation and carrier offset for fast test result determination.

### D. ASK/FSK SIGNAL DEMODULATION & ANALYSIS



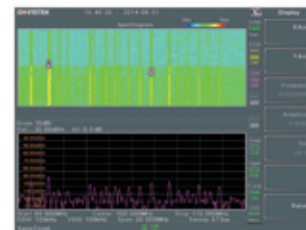
RFID and optical communications systems often use Amplitude Shift Keying (ASK). Applications such as wireless telephone, paging systems, and RFID, etc. utilize Frequency Shift Keying (FSK). ASK/FSK demodulation and analysis measures parameters including AM depth, frequency deviation, modulation rate, 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.

### E. EMC PRETEST MODE



GSP-9300 supports -6dB EMI filter with 200/9k/120k/1M Hz bandwidth and built-in low noise amplifier. Users can apply maximum peak detector and EMI filter to conduct pre-compliance testing for electronics products. Users can activate built-in amplifier to measure feeble electromagnetic interfering signals to -150dBm/Hz in 1GHz frequency band. EMC pretest mode collocates with near field probe or antenna to carry out conduction and radiation electromagnetic interference (EMI) test. Additionally, near field probe and GSP-9300 tracking generator can be used to output 0dBm RF signals to test electromagnetic susceptibility (EMS) for electronics products.

### F. 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.

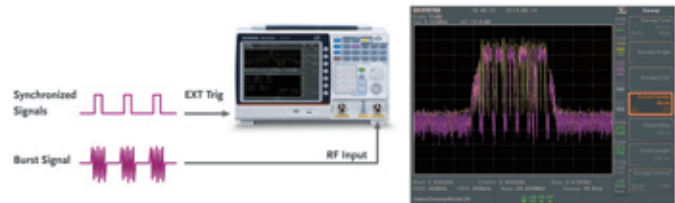
# 3GHz Spectrum Analyzer

## G. TOPOGRAPHIC



Topographic uses color shade to show the probability distribution of signal appearance. This function allows users to directly understand the process of signal variation according to time changes that is beneficial to observe intermittent feeble signals or electromagnetic interference signals. Users can use two markers to find out the relation of power to frequency and percentage.

## H. GATED SWEEP



Radar or TDMA communications systems, via intermittently turning on/off output power, control transmission signals. In order to monitor the power spectrum during the transmission process, the Gated Sweep function can initiate measurement only when signals appear. This function is ideal for measuring burst signals such as GSM or WLAN (as shown in the example).

## I. OCBW/ACPR



Occupied Bandwidth

Adjacent Channel Power Ratio

The OCBW measurement can simultaneously display OCBW, channel power and PSD. OCBW's unit is shown by percentage. A measurement area containing bandwidth will be shown when OCBW is in use. Telecommunications and broadcasting service carriers must reduce interference to the minimum. This interference is caused by power leakage to adjacent transmission channels. The ACPR measurement can examine the leakage status that is conducive to identifying interference source.

## J. SEM



Spectrum Emission Mask

SEM measures out-of-channel emission which is defined by corresponding in-channel power. Users can set main channel's parameters, out-of-channel range, and limit line, etc. SEM supports the Pass/Fail test function and lists frequency range for surpassing each out-of-channel limit. An alarm signal will be triggered if any measurement results that are not matched with SEM. GSP-9300 has the built-in SEM settings of 3GPP, WLAN 802.11b/g/n, Wimax 802.16 and self-defined communications system.

## K. TOI



Third Order Intercept

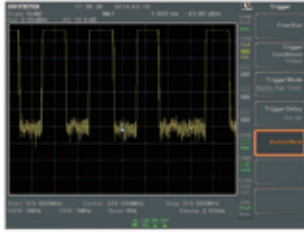
Users can measure the linearity of non-linear systems and components such as receiver, low-noise amplifier and mixer by TOI which automatically tests effective carrier and measures inter-modulation sidebands.

## L. HARMONIC



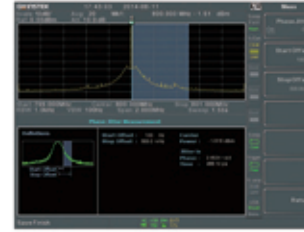
Harmonic can easily measure the amplitude of fundamental frequency and as high as ten order of harmonic frequency. This function can also measure amplitude (dBc) which is the ratio of harmonic and corresponding fundamental carrier. Total harmonic distortion (THD) can also be calculated by this function.

## M. TIME DOMAIN POWER



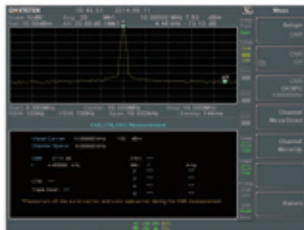
Users can go to zero span setting and open marker to observe burst signals when measuring burst signal in time domain is required.

## N. PHASE JITTER



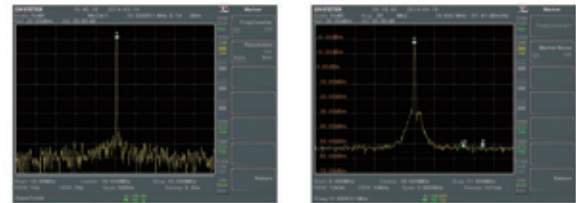
The Phase Jitter function can rapidly measure phase noise produced by RF signal source's and oscillator's carrier deviation. This function can directly convert signal jitter to phase (rad) and time (ns).

## O. CNR/CSO/CTB



The built-in CNR/CSO/CTB functions of GSP-9300 are ideal for measuring performance of CATV amplifier and system.

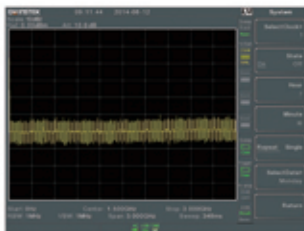
## P. FREQUENCY COUNTER & MARKER NOISE



The frequency counter function is used to make accurate frequency measurements up to 1Hz resolution. The marker noise function calculates the average noise level over a bandwidth of 1Hz, referenced from the marker position.

## PRODUCTION LINE KEY FEATURES

### A. SHORTEN WARM-UP TIME & WAKE-UP CLOCK



GSP-9300 utilizes the patented design of high efficient heat dissipation and feedback temperature control. After the instrument is turned on, the internal instrument can rapidly maintain a stable temperature so as to provide accurate amplitude measurement and deliver the frequency measurement with 0.025ppm frequency stability. Users can set up automatic wake-up time for each day of the week. By so doing, the purpose of GSP-9300 pre wake-up can be achieved. Pre wake-up is ideal for the lower temperature environment to conduct tests in the preset time.

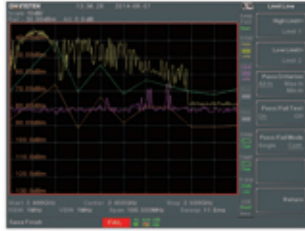
### B. SEQUENCE FUNCTION



The sequence function allows users to edit a sequence formulated by a series of steps directly from the instrument. Pause and delay can be inserted in the sequence to observe the test results. There are five sets of sequence for selection. Each sequence allows editing of 20 steps. Different sequence can be interactive and support each other. This function provides automatic editing without using the PC that is very convenient for assembly lines in which execute routine test procedures.

# 3GHz Spectrum Analyzer

## C. LIMIT LINE FUNCTION



The limit line function, based upon the preset criteria of passing the test, can be used to directly determine whether the DUT passes the test. Test result not only can be shown on the LCD screen, but also an alarm signal output indication which is done by connecting a speaker or light device with the BNC terminal on the rear panel to facilitate the maximum yield rate of the production line.

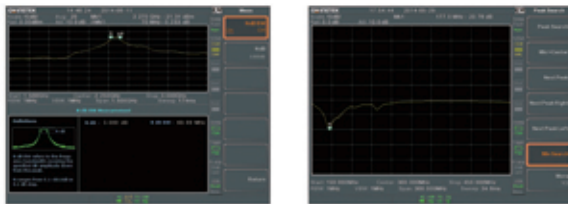
## D. VARIOUS INTERFACE



GSP-9300 provides instrument control interface including LAN, RS-232, USB, and GPIB (optional).IVI driver is also provided to support LabVIEW/CVI/LabWindows to meet the requirements of editing the automatic test software.

## OPTIONS

### A. SCALAR NETWORK ANALYSIS



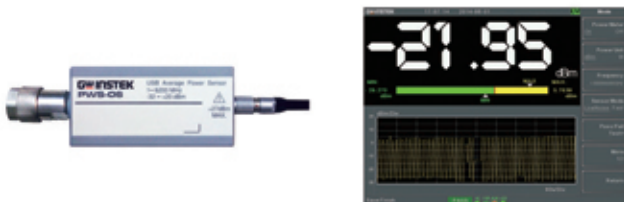
The built-in tracking generator can swiftly and easily measure frequency response of cable loss, filter bandwidth, amplifier gain, mixer conversion loss, etc. The N-dB Bandwidth function measures 3dB bandwidth of Bandpass filter. SWR bridge should be connected with tracking generator to measure the return loss of antenna or filter.

### B. 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. The GSP-9300 tracking generator supports 50dB power sweep range; output power from 0dBm to -50dBm; frequency range from 100kHz to 3GHz.

### C. POWER METER



GSP-9300 connecting with PWS-06 USB power sensor can be applied to execute high precision average power measurement for USB PnP. PWS-06 USB power sensor has the built-in zero function; therefore, calibration by an external signal source is unnecessary. GSP-9300 not only collects, displays, and stores the measurement results of power meter, but also provides the Pass/Fail function.

### D. BATTERY PACK



Compact and light-weighted (4kg) GSP-9300 can be powered by battery making it suitable for outdoor operations. Optional GSP-9300 battery pack (opt.02) has a battery life of two hours. Optional soft carrying case (GSC-009) provides convenience and protection to the instrument. GSP-9300 is equipped with 8.4 inches 800x600 pixels LCD display which yields clearer display results for outdoor operations.

## USER FRIENDLY DESIGN

### A. STATUS ICONS



Status Icons show the interface status, power status, alarm status and etc of GSP-9300. Users can easily understand the setting status and test results of the instrument.

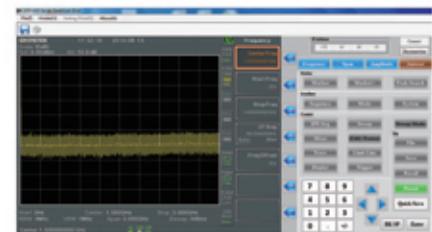
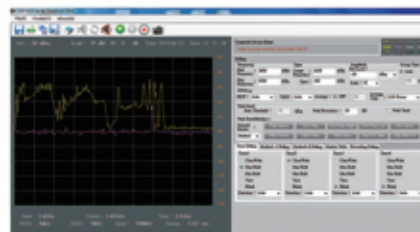
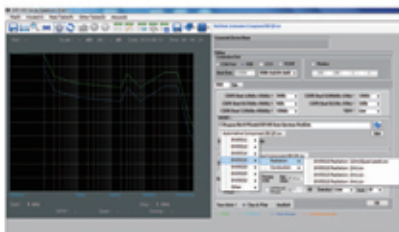
### B. DEFINITION HELP



The built-in Definition Help function allows users to immediately understand the parameters of Channel Power, OCBW, ACPR, SEM, Phase Jitter, N-dB Bandwidth & P1dB items so as to save time on reading user manual.

## EXTERNAL PC SOFTWARE & DRIVER SUPPORT

### A. SPECTRUMSHOT SOFTWARE & IVI DRIVER



Users can use the external software SpectrumShot for EMI test report management and assessment, remote control and waveform data recording for long periods of time. Under the EMI Pre-test Mode, users can select the required CISPR EMI regulation for conduction and radiation measurement. Under Get Trace mode, users can record the waveform data for long periods of time. It can be applied to spectrum monitoring for

detecting any abnormal radio signals. The software will send out e-mail to inform users if any abnormal situation occurs. Under the Remote Control mode, users can monitor wireless interference signals or observe signals for long periods of time.

IVI Driver Supports LabView/LabWindows/CVI Programming. It is available on NI website.

### B. GSP-9300 REMOTE CONTROL APP



Users can install the "GSP-9300 Remote Control" APP on an Android Smart Phone or Tablet. To use the GSP-9300 as a server using a 3G modem, the user must first obtain a fixed IP address from a network provider.

For remote locations, using a 3G modem allows the user to remote control the GSP-9300 Spectrum Analyzer. It is available on Google Play Store.

# 3GHz Spectrum Analyzer

## PANEL INTRODUCTION



- |                   |  |   |
|-------------------|--|---|
| 1. LCD Display    | 11. Numeric Keys                           | 21. USB-B, LAN Port                     |
| 2. Function Keys  | 12. Enter, BK SP, Preset & Quick Save Keys | 22. Trigger Input/Gate Input Port       |
| 3. Main Keys      | 13. Tracking Generator Output              | 23. Alarm Output/Open Collector         |
| 4. Control Keys   | 14. DC Power Supply                        | 24. REF Output                          |
| 5. Power Key      | 15. RF Input Terminal                      | 25. REF Input                           |
| 6. File Keys      | 16. USB-A, Micro SD Port                   | 26. Fan                                 |
| 7. Marker Keys    | 17. RS-232 Port                            | 27. GPIB Port (Optional)                |
| 8. Auxiliary Keys | 18. DVI-I Port                             | 28. Battery Cover/Optional Battery Pack |
| 9. Scroll Wheel   | 19. Headphone Jack                         | 29. Power Socket                        |
| 10. Arrow Keys    | 20. IF Output                              |   |



## 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   |
| Aging Rate  | $\pm 2$ ppm max.   | 0 ~ 50 °C  |
| Frequency Stability Over Temperature  | $\pm 0.025$ ppm  |  |
| Supply Voltage Stability  | $\pm 0.02$ ppm   |  |
| FREQUENCY READOUT ACCURACY  |  |  |
| Start, Stop, Center,  | $\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + 10\% \times \text{RBW} + \text{frequency resolution}^{\ast 1})$       |  |
| Marker  |  |  |
| Trace Points  | Max. 601 points, Min. 6 points   |  |
| MARKER FREQUENCY COUNTER  |  |  |
| Resolution  | 1 Hz, 10 Hz, 100 Hz, 1 kHz   |  |
| Accuracy  | $\pm(\text{marker frequency indication} \times \text{frequency reference accuracy} + \text{counter resolution})$   | RBW/Span $\geq 0.02$ ; Mkr level to DNL > 30 dB  |
| FREQUENCY SPAN  |  |  |
| Range   | 0 Hz (zero span), 100 Hz ~ 3 GHz   |  |
| Resolution  | 1 Hz   |  |
| Accuracy  | $\pm$ frequency resolution $^{\ast 1}$   | RBW : Auto   |
| PHASE NOISE   |  |  |
| Offset from Carrier   |  | Fc=1GHz;RBW=1kHz,VBW=10Hz;Average $\geq 40$  |
| 10 kHz  | < -88 dBc/Hz   | Typical $^{\ast 2}$  |
| 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<br>200 Hz, 9 kHz, 120 kHz, 1MHz  | -3dB bandwidth<br>-6dB bandwidth   |
| Accuracy  | $\pm 8\%$ , RBW = 1 MHz<br>$\pm 5\%$ , RBW < 1 MHz   | Nominal $^{\ast 3}$<br>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   |
| $^{\ast 1}$ Frequency Resolution = Span/(Trace points - 1)<br>$^{\ast 2}$ 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.<br>$^{\ast 3}$ Nominal values indicate expected performance. They are not covered by the product warranty. |  |  |
| AMPLITUDE   |  |  |
| AMPLITUDE RANGE   |  |  |
| Measurement Range   | 100 kHz ~ 1 MHz<br>1 MHz ~ 10 MHz<br>10 MHz ~ 3 GHz  | Displayed Average Noise Level(DANL)to 18 dBm<br>DANL to 21 dBm<br>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   | $\leq +33$ dBm   | Input attenuator $\geq 10$ dB  |
| DC Voltage  | $\pm 50$ V   |  |
| 1 dB GAIN COMPRESSION   |  |  |
| Total Power at 1st Mixer  | > 0 dBm  | Typical ; Fc $\geq 50$ MHz; preamp. off  |
| Total Power at the Preamp   | > -22 dBm  | Typical ; Fc $\geq 50$ MHz; preamp. on<br>Mixer power level (dBm) = input power (dBm) - attenuation (dB) |
| DISPLAYED AVERAGE NOISE LEVEL (DANL) $^{\ast 4}$  |  |  |
| Preamp off  | 0 dB attenuation; RF Input is terminated with a 50 $\Omega$ load.<br>RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = -60 dBm; trace average $\geq 40$ |  |
| 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 $\Omega$ load.<br>RBW 10 Hz; VBW 10 Hz; span 500 Hz; reference level = -60 dBm; trace average $\geq 40$ |  |
| 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  |

# 3GHz Spectrum Analyzer

## SPECIFICATIONS

| LEVEL DISPLAY RANGE   |   |   |
|---|---|---|
| Scales<br>Units<br>Marker Level Readout   | Log, Linear<br>dBm, dBmV, dBuV, V, W<br>0.01 dB<br>0.01 % of reference level  | Log scale<br>Linear scale   |
| Level Display Modes<br>Number of Traces<br>Detector   | Trace, Topographic, Spectrogram<br>4<br>Positive-peak, negative-peak, sample, normal,<br>RMS(not Video)   | Single/Split Windows  |
| Trace Functions   | 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<br>100 kHz; log scale; 1 dB/div; peak detector; 20 ~ 30°C;<br>signal input : 0 dBm                        |   |
| Preamp off<br>Preamp on   | ± 0.3 dB<br>± 0.4 dB  | Ref level 0 dBm; 10 dB RF attenuation<br>Ref level -30 dBm; 0 dB RF attenuation   |
| FREQUENCY RESPONSE  |   |   |
| Preamp off<br>100 kHz ~ 2 GHz<br>2 GHz ~ 3 GHz<br>Preamp on<br>1 MHz ~ 2 GHz<br>2 GHz ~ 3 GHz | Attenuation: 10 dB; Reference: 160 MHz; 20 ~ 30°C<br>± 0.5 dB<br>± 0.7 dB<br>Attenuation: 0 dB; Reference: 160 MHz; 20 ~ 30°C<br>± 0.6 dB<br>± 0.8 dB |   |
| ATTENUATION SWITCHING UNCERTAINTY   |   |   |
| Attenuator Setting<br>Uncertainty   | 0 ~ 50 dB in 1 dB steps<br>± 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<br>0 ~ -50dBm; Input attenuation 10dB; RBW 1kHz; VBW 1 kHz;<br>after cal; Preamp off |
| Accuracy  | ± 0.5 dB  | Typical   |
| SPURIOUS RESPONSE   |   |   |
| Second Harmonic<br>Intercept  | +35 dBm<br>+60 dBm  | Preamp off; signal input -30dBm; 0 dB attenuation<br>Typical : 10 MHz < fc < 775 MHz<br>Typical : 775 MHz ≤ fc < 1.5 GHz                                  |
| Third-order<br>Intercept  | > 1dBm  | Preamp off; signal input -30dBm; 0 dB attenuation<br>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<br>50 μs ~ 1000 s   | Span > 0 Hz<br>Span = 0 Hz; Min resolution=10μs   |
| Sweep Mode<br>Trigger Source<br>Trigger Slope   | Continuous; Single<br>Free run; Video; External<br>Positive or negative edge  |   |
| RF PREAMPLIFIER   |   |   |
| Frequency Range<br>Gain   | 1 MHz ~ 3 GHz<br>18 dB  | Nominal (installed as standard)   |
| FRONT PANEL INPUT/OUTPUT  |   |   |
| RF INPUT  |   |   |
| Connector Type<br>Impedance<br>VSWR   | N-type female<br>50 Ω<br><1.6 :1  | Nominal<br>300 kHz to 3 GHz ; Input attenuator ≥ 10 dB  |
| POWER FOR OPTION  |   |   |
| Connector Type<br>Voltage/Current   | SMB male<br>DC +7V/500 mA max   | With short-circuit protection   |
| USB HOST  |   |   |
| Connector Type<br>Protocol  | A plug<br>Version 2.0   | Support Full/High/Low speed   |
| MICRO SD SOCKET   |   |   |
| Protocol<br>Support Cards   | SD 1.1<br>Micro SD, Micro SDHC  | Up to 32GB capacity   |
| REAR PANEL INPUT/OUTPUT   |   |   |
| REFERENCE OUTPUT  |   |   |
| Connector Type<br>Output Frequency<br>Output Amplitude<br>Output Impedance                    | BNC female<br>10 MHz<br>3.3V CMOS<br>50 Ω   | Nominal   |
| REFERENCE INPUT   |   |   |
| Connector Type<br>Input Reference Frequency<br>Input Amplitude<br>Frequency Lock Range        | BNC female<br>10 MHz<br>-5 dBm ~ +10 dBm<br>Within ± 5 ppm of the input reference frequency   |   |
| ALARM OUTPUT  |   |   |
| Connector Type  | BNC female  | Open-collector  |
| TRIGGER INPUT/GATED SWEEP INPUT   |   |   |
| Connector Type<br>Input Amplitude<br>Switch   | BNC female<br>3.3V CMOS<br>Auto selection by function   |   |

## SPECIFICATIONS

|  |  |  |
|--|--|--|
| <b>LAN TCP/IP INTERFACE</b>                      |  |  |
| Connector Type                                   | RJ-45  |  |
| Base   | 10Base-T; 100Base-Tx; Auto-MDIX  |  |
| <b>USB DEVICE</b>                                |  |  |
| Connector Type                                   | B plug   | For remote control only; supports USB TMC  |
| Protocol   | Version 2.0  |  |
| <b>IF OUTPUT</b>                                 |  |  |
| Connector Type                                   | SMA female   | Nominal  |
| Impedance  | 50Ω  | Nominal  |
| IF Frequency                                     | 886 MHz  | 10 dB attenuation; RF input : 0 dBm @ 1 GHz  |
| Output Level                                     | -25 dBm  |  |
| <b>EARPHONE OUTPUT</b>                           |  |  |
| Connector Type                                   | 3.5mm stereo jack  | Wired for mono operation   |
| <b>VIDEO OUTPUT</b>                              |  |  |
| Connector Type                                   | DVI-I (integrated analog and digital), Single Link   | Compatible with VGA or HDMI standard through adapter   |
| <b>RS-232C INTERFACE</b>                         |  |  |
| Connector Type                                   | D-sub 9-pin female   | Tx, Rx, RTS, CTS   |
| <b>GPIB INTERFACE (OPTIONAL)</b>                 |  |  |
| Connector Type                                   | IEEE-488 bus connector   |  |
| <b>AC POWER INPUT</b>                            |  |  |
| Power Source                                     | AC 100 V ~ 240 V, 50/60 Hz   | Auto range selection   |
| <b>BATTERY PACK (OPTIONAL)</b>                   |  |  |
| Battery Pack                                     | 6 cells, Li-Ion rechargeable, 352P   | With UN38.3 Certification  |
| Voltage  | DC 10.8 V  |  |
| Capacity   | 5200 mAh/56Wh  |  |
| <b>GENERAL</b>                                   |  |  |
| Monitor Display                                  | 8.4 inch TFT LCD. SVGA Resolution, 800 x 600 pixel   | Nominal  |
| Internal Data Storage                            | 16 MB nominal  |  |
| Power Consumption                                | < 65 W   |  |
| Warm-up Time                                     | < 30 minutes   |  |
| Temperature Range                                | +5 °C ~ +45 °C<br>-20 °C ~ +70 °C  | Operating<br>Storage   |
| Dimensions & Weight                              | 350(W) x 213(H) x 105.7(D) mm, Approx. 4.5kg<br>13.8(W) x 8.3(H) x 3.9(D) inch, Approx. 9.9lb  | Inc. all options (Basic + TG + GPIB + Battery)   |
| <b>TRACKING GENERATOR<sup>*5</sup>(OPTIONAL)</b> |  |  |
|  |  | <sup>*5</sup> 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  | @160 MHz, -10 dBm, Source attenuation 10 dB, 20 ~ 30°C   |
| Absolute Accuracy                                | ± 0.5 dB   | ± 1.5 dB   |
| Output Flatness                                  | Referenced ~ 160 MHz, -10 dBm<br>100 kHz ~ 2 GHz<br>2 GHz ~ 3 GHz  | ± 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  | Nominal  |
| Impedance  | 50 Ω   | 300 kHz ~ 3 GHz, source attenuation ≥ 12 dB  |
| Output VSWR                                      | < 1.6 : 1  |  |
| <b>RF POWER SENSOR (OPTIONAL)</b>                |  |  |
| 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  | Typical  |
| Input VSWR                                       | 1.1 : 1<br>1.3 : 1   | 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<br>3 GHz ~ 6 GHz: ±0.15 dB typical<br>+5 dBm ~ +12 dBm: 1 MHz ~ 3GHz: ±0.15 dB typical<br>3 GHz ~ 6 GHz: ±0.15 dB typical<br>+12 dBm ~ +20 dBm: 1 MHz ~ 3GHz: ±0.20 dB typical<br>3 GHz ~ 6 GHz: ±0.20 dB typical | ± 0.30 dB max.<br>± 0.30 dB max.<br>± 0.30 dB max.<br>± 0.30 dB max.<br>± 0.40 dB max.<br>± 0.40 dB max. |
| Power Measurement Uncertainty @0 ~ 25 °C         | -30 dBm ~ +5 dBm: 1 MHz ~ 3GHz: ±0.25 dB typical<br>3 GHz ~ 6 GHz: ±0.25 dB typical<br>+5 dBm ~ +12 dBm: 1 MHz ~ 3GHz: ±0.20 dB typical<br>3 GHz ~ 6 GHz: ±0.20 dB typical<br>+12 dBm ~ +20 dBm: 1 MHz ~ 3GHz: ±0.35 dB typical<br>3 GHz ~ 6 GHz: ±0.30 dB typical |  |
| Linearity @25 °C                                 | ± 3 %  | Typical  |
| Measurement Speed                                | 100 ms for Low Noise Mode<br>30 ms for Fast Mode   |  |

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.

## 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

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

DISTRIBUTOR :

SP-9300GD1BH

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