



Test Instrumentation Catalog

2011

Microwave Signal Generators | Microwave Power Amplifiers | Microwave Power Measurement

Celebrating **30** years

34882-Rev.B / US110519



Founded in 1980, Giga-tronics Incorporated (Nasdaq “GIGA”), an ISO 9001 and AS 9100 certified company, headquartered in San Ramon, California, is a leading engineering-and-design manufacturer of best-in-class RF and microwave signal generators, microwave power amplifiers, USB power sensors, microwave power meters and broadband switching matrices. R&D, production and test managers, scientists, engineers and technicians, around the world, use Giga-tronics test equipment to realize higher productivity and greater ease of use in many applications: ATE systems, aerospace & defense, communications and general microwave component test.

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Overview:

The Giga-tronics Microwave Signal Generators provide state-of-the-art performance with fast switching speed and high output power without any compromise in signal purity. Giga-tronics offers Microwave Signal Generator 2500B with frequency ranges to 50 GHz and ultra-low phase noise. The Giga-tronics Microwave Signal Generators are fast, east-to-use, super clean and loaded with features including high-stability time base, fine resolution, multiple sweep modes and a full suite of analog modulation capabilities.

Applications:

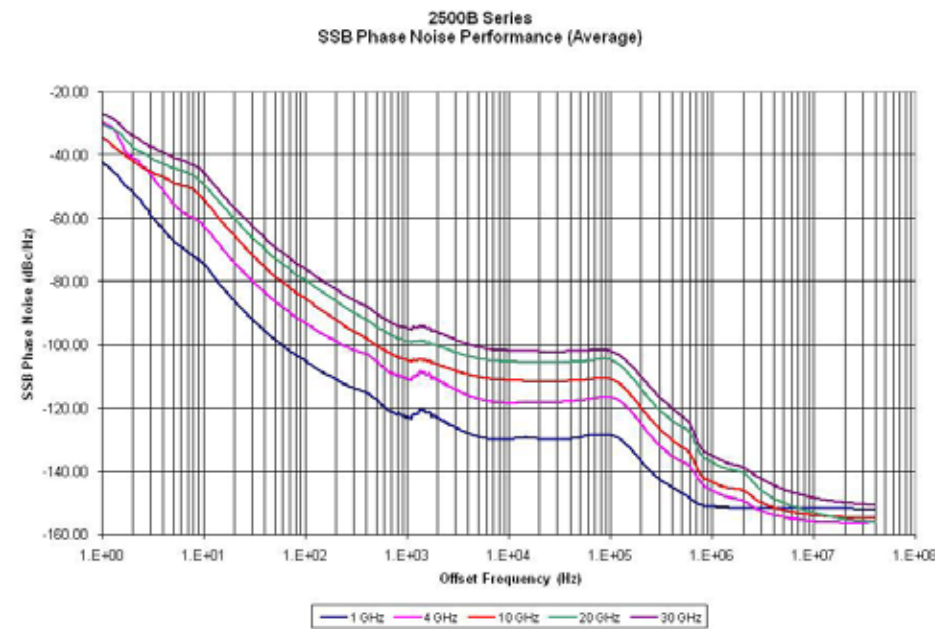
- Aerospace and Defense R&D, Manufacturing and Maintenance
- Signal Simulation for Radar and EW Testing
- Microwave Communications R&D and Manufacturing
- ATE for Higher Through-put, Lower Cost of Test
 - Data-intensive Applications
 - Antenna Testing
 - Satellite Payload Testing
 - RFIC & MMIC Testing
- Microwave Component and Assembly R&D and Manufacturing

Benefits:

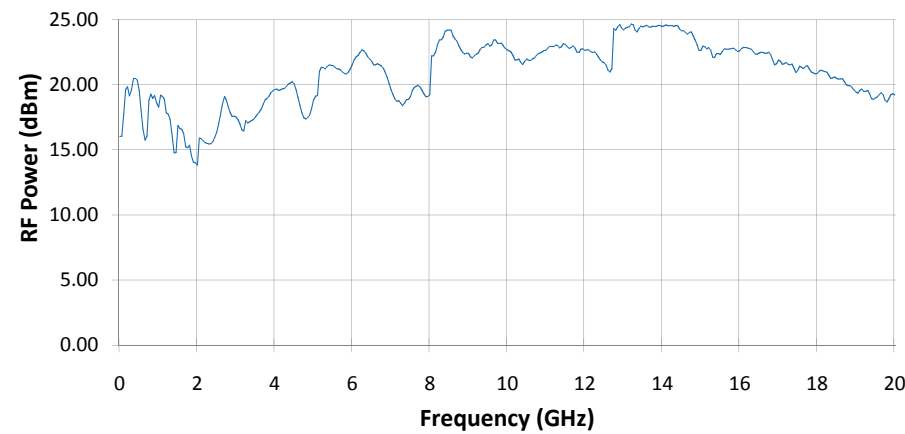
- Low phase noise and low spurious means clean pure signals to meet your most challenging test needs
- High output power overcomes losses in cables and signal switching
- Fast switching speed improves test through-put and provides agility for signal simulation applications
- Emulation modes available for replacement of obsolete signal generators
- Easy-to-use front panel accommodates wide variety of user skill levels

Key Specifications:

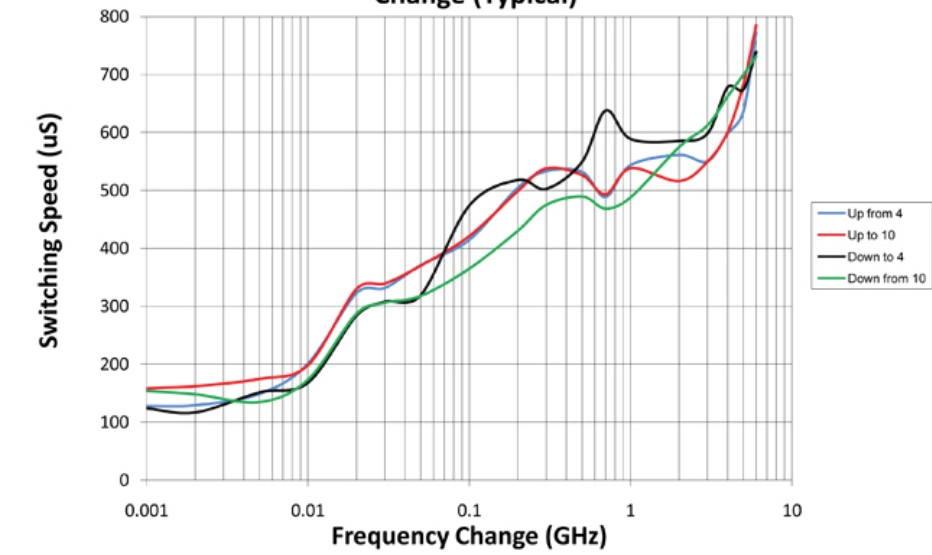
	2500B
Frequency Range	100 kHz to 2, 8, 20, 26.5, 40 or 50 GHz
Frequency Resolution	0.001 Hz
Max Leveled Output Power	+20 dBm at 20 GHz, +11 dBm at 50 GHz
Time Based Stability	< 5 x 10 ⁻¹⁰ /day
Switching Speed	500 μs per point
Phase Noise	< -109 dBc/Hz typical at 10 GHz and 10 Hz offset
Harmonics and Spurious	< -58 dBc



Giga-tronics 2520 Maximum Unleveled Output Power with Step Attenuator (Typical)



Giga-tronics 2500 Series Switching Speed vs. Frequency Change (Typical)



Automation Xpress: Optimized for Automated Test

Automation Xpress (AX) software is included with the 2500B series Microwave Signal Generators, enhancing the ability of ATE integrators to control and configure the signal generators to address their specific needs. AX enables easy downloads of complex lists and setup and modification of parameters, all in a familiar windows-based application. A comprehensive list mode, command-line interpreter with script and loop capability, and an auto-programming capability are just a few of the features that test system programmers will appreciate when developing and debugging Test Program Sets.



Key Features:

- Faster CW switching & list download enables faster testing and more device throughput
- Reduced cost of test- increased return on investment
- Reduce programming training and costs
- Streamlines the programming environment by ensuring consistent development
- Increase testing confidence with quality and rapid development





Overview:

The Giga-tronics Microwave Power Amplifiers offer linear high-power amplification across multi-octave bands. They are ideal for testing in EMC, wireless communications applications and Defense EW systems and broadband testing without band switching or swapping narrow band amplifiers resulting in faster and more accurate testing.

- GT-1000A 2 GHz to 20 GHz
- GT-1020A 100 MHz to 20 GHz
- GT-1040A 10 MHz to 40 GHz
- GT-1050A 2 GHz to 50 GHz
- GT-1051A 10 MHz to 50 GHz

Key Specifications:

GT-1000A	GT-1020A	GT-1040A	GT-1050A / GT-1051A
10 Watt to 8 GHz 5 Watt to 20 GHz	1/2 Watt to 20 GHz	1/4 Watt to 20 GHz 200 mWatt to 40 GHz	1/4 Watt at 50 GHz, 1/2 Watt at 40 GHz
2 GHz to 20 GHz	100 MHz to 20 GHz	10 MHz to 40 GHz	10 MHz to 50 GHz
Harmonics and < -60 dBc typ.	Harmonics < -30 dBc typ. Spurious < -60 dBc typ.	Harmonics < -30 dBc typ. Spurious < -60 dBc typ.	Harmonics < -30 dBc typ. Spurious < -60 dBc typ.
Gain 35 dB nom. Flatness: +/- 3 dB max.	Gain 35 dB nom. Flatness ± 2.5 dB typ.	Gain 25 dB nom. Flatness ± 2.5 dB typ.	Gain 25 dB nom. Flatness +/- 3 dB typ.
Noise Figure < 10 dB typical	Noise Figure < 5 dB typ.	Noise Figure < 6 dB typ.	Noise Figure < 10 dB typ.

Key Benefits:

- Wide frequency range eliminates the need for band switching providing reduced cost and complexity while increasing reliability
- The solid-state parallel MMIC design delivers high reliability and long life.
- Excellent linear performance with high gain, low noise figure and low intermodulation distortion (IMD)

Applications:

- Aerospace and Defense applications, including EW, ECM, ECCM, radar and satellite system signal simulation and testing
- Wireless communications and component testing
- R&D benchtop amplifier

Replace traveling wave tube amplifiers with a higher reliability, solid-state amplifier for improved noise performance and reduced Intermodulation Distortion (IMD). Test broadband devices from RF to microwave without changing transmission paths or exchanging amplifiers manually. Eliminate complex programming caused by manual switching of amplifiers during test. Do away with plugging and unplugging amplifiers in manual test stations by replacing your narrow band amplifiers with one broadband amplifier.



Pairing with Microwave Signal Generator...

The amplifiers can be paired with Giga-tronics Microwave Signal Generator 2500B series, increasing the overall output power while preserving the synthesizer's fast switching speed, modulation, and high signal fidelity.





Overview:

The Giga-tronics GT-8550A USB Power Sensors offer easy-to-use high-performance RF and microwave power measurement. High dynamic range and high accuracy make these sensors ideal for testing in wireless communication applications and Defense EW systems. The GT-8550A series feature a ruggedized body and fast measurement speed. These broadband power sensors provide easy-to-use, fast, accurate power measurement for R&D laboratory, manufacturing test and field installation and maintenance applications.

Key Features:

- Models:
 - 10 MHz to 26.5 GHz
 - CW, Modulation, Pulse
- Range:
 - -60 to +20 dBm range to 6 GHz
 - -50 to +20 dBm range to 26.5 GHz
- VSWR:
 - < 1.15:1 up to 8 GHz
 - < 1.20:1 up to 18 GHz
 - < 1.30:1 up to 26.5 GHz
- Measurement speed:
 - 2000 readings / sec typical

Key Benefits:

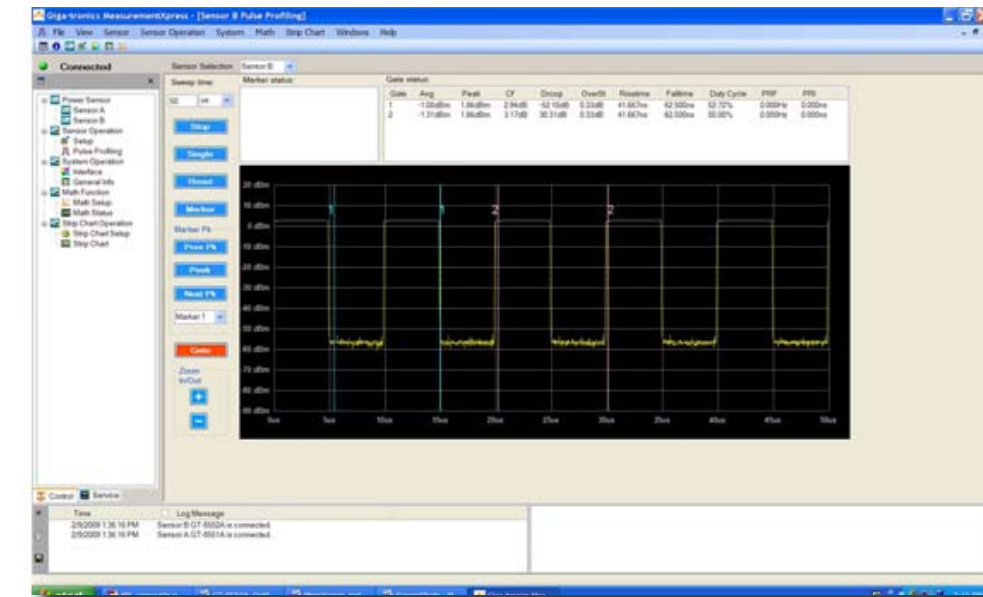
- Fully calibrated - no need to cal or zero the sensor
- Fast measurement speed saves time and increases productivity
- Saves cost and space
- Ruggedized body increases reliability, reduces damage from mishandling

Applications:

- Wireless Communications and Component Testing
- R&D laboratory and Manufacturing
- Field Maintenance and remote Monitoring

USB Power Sensors Selection Guide

Model	GT-8551A	GT-8552A	GT-8553A	GT-8554A	GT-8555A
Frequency Range	100 MHz to 8 GHz (operational to 10 GHz)	100 MHz to 8 GHz (operational to 10 GHz)	10 MHz to 18 GHz	10 MHz to 26.5 GHz	100 MHz to 20 GHz
Measurements	CW, Modulation, Average	CW, Average, Pulse (Peak)	CW	CW	CW, Average, Pulse (Peak)
Dynamic Range	-60 to +20 dBm	-60 to +20 dBm	-50 to +20 dBm	-50 to +20 dBm	-40 dBm to +20 dBm
Connector	Type N (m)	Type N (m)	Type N (m)	SMA (m)	SMA (m)



Pulse Profiling Application displays power envelope versus time

Measurement Xpress Software

The Giga-tronics GT-8550A series USB Power Sensors are designed for use with a standard PC running Microsoft® Windows XP, Vista or Windows 7. The Giga-tronics GT-8550A series USB Power Sensors include the easy-to-use application software, Measurement Xpress. The Measurement Xpress software provides a suite of measurement capabilities which include remote control and multi-channel power measurements. Features include a graphical user interface (GUI) with easily selectable multi-channel displays.

Features include a familiar windows-based graphical user interface (GUI) and optimized for multi-channel displays for up to 12 sensors.

Key Functions:

- Pulse Profiling with a Full Suite of Pulse Measurements
- Modes: CW, Modulated Average Power, Burst Average Power
- Math Functions and Statistics
- Markers, Gating, Triggers and Limits
- Strip Chart





Overview:

The Giga-tronics 8651B Single-Input Power Meter and 8652B Dual-Input Power Meter offer high-performance RF and Microwave power measurement. The Giga-tronics 8650B Series Universal Power Meters have the extensive measurement capabilities and features you need to test today's sophisticated systems faster, easier and more accurately.

Key Specifications:

- Frequency Ranges to 50 GHz
- Power Ranges from -70 dBm to +47 dBm
- Low-VSWR, Peak and Modulated Average Power Sensors
- Measurement Speed up to 26,000 readings/sec

Key Benefits:

- Super-Fast 26,000 readings/sec for CW signals and over 800 readings/sec for modulated signals
- Large selection of power sensors to choose from
- Statistical analysis: Histogram, CCDF/CDF, crest factor and standard deviation
- Wide dynamic video bandwidth for measuring signals with complex modulation

Applications:

- Aerospace and Defense ATE
- Radar Systems and EW measurement
- R&D Laboratory and Manufacturing



Power Sensors

Giga-tronics' advanced power meter architecture provides for a broad choice of power sensors. Giga-tronics offers sensors for CW power, pulse power, and the peak and average of complex modulated signals. Measure power faster, more accurately, and over a wider range.



CW Power Measurement

Measure CW power from 10 MHz to 50 GHz at more than 26,500 readings per second over GPIB. Measure up to 90 dB with a single sensor, and select from a variety of high power sensors, up to 50 W.

- 80301A Series Standard Power Sensor +20 dBm to -70 dBm, 10 MHz to 40 GHz
- 80310A Series Low VSWR Power Sensor, +26 dBm to -64 dBm, 10 MHz to 40 GHz
- 80320A Series High Power Sensor, +30 dBm to +47 dBm (1 W to 50 W), 10 MHz to 40 GHz
- 80330A Series True RMS Power Sensor, +20 dBm to -30 dBm, 10 MHz to 40 GHz
- 81305A, -50 dBm to +20 dBm, 10 MHz to 50 GHz



Peak Pulse Power Measurement

Directly measure the instantaneous peak power level of pulse modulated signals. Use the 'sample delay' function to set the desired measurement point on the waveform. And an external scope can be used to view the profile and see the exact measurement point on the pulse.

- 80350A Series, -20 dBm to +5 dBm, 45 MHz to 40 GHz

Modulated Average Power Measurement

- Giga-tronics 80400A Series Modulated Power Sensors measure the average power of amplitude modulated, burst modulated and other complex modulated signals, such as GSM and TDMA signals.
- Giga-tronics 80701A Modulated Power Sensors provides a modulation bandwidth up to 10 MHz to measure the peak and average power of wide band, third-generation CDMA signals up to a 80 dB range.



Overview:

The Giga-tronics 8500A Series Peak Power Meters combine CW power measurement with the ability to make precise peak power measurements at any point on a pulsed waveform. This built-in capability lets you make CW measurements and analyze pulsed waveforms with a single instrument.

Key Specifications:

- Rise time < 15 ns
- Sensor frequency range from 0.03 or 0.75 to 18.5, 26.5 or 40 GHz
- Power Range: -20 to +20 dBm Pulse; -40 to +20 dBm CW
- Measurement resolution is 100 ps



From Off-the-Shelf to Tailored Solutions

... meet your demanding requirements

Giga-tronics designs and manufactures over 200 modular ASCOR brand switch products with a frequency range from DC to RF/microwave to 50 GHz and lightwave and the capability to switch from low-level to high-power signals. The ASCOR line offers a complete range of VXI™, PXI™, GPIB and LAN controlled switching and digital I/O modules for communication, industrial, medical, scientific, and military/aerospace automatic test applications. If there is not already an off-the-shelf product to meet your requirements, Giga-tronics offers tailored solutions available quickly at off-the-shelf-prices.

visit the website: www.gigatronics.com/switching or ask your Giga-tronics representative for our switching catalog



SCALAR NETWORK ANALYZER

Overview:

The Giga-tronics 8003 Precision Scalar Analyzer combines a 90 dB wide dynamic range with the accuracy and linearity of a power meter in a single instrument.

Key Specifications:

Measures active and passive components with power meter accuracy from 10 MHz to 40 GHz. AC and DC detection is available with equal accuracy on the 3 inputs and standard, high-power, true RMS, low VSWR and triggerable pulse power sensors are available. Additionally, precision CW return loss bridges are available.

- Sensor frequency range from 0.01 to 18, 20, 26.5, or 40 GHz
- Dynamic Range: 90 dBm; -70 to +20 dBm CW; -20 to +20 dBm Pulse
- Linearity of ±0.02 dB (0.5%) over any 20 dB span
- Linearity of ±0.04 dB (1%) over the entire 90 dB span



MICROWAVE SYNTHESIZER MODULES, YIG FILTERS AND YIG OSCILLATORS

Our core technologies in microwave signal generation and filtering have enabled us to design unique integrated electronic assemblies for leading aerospace and defense, test and measurement, and communications companies. These include special microwave synthesizers, integrated microwave front ends, exciters, wideband, ultra-low noise YIG oscillators and fast-tuning and highly accurate YIG filters. Many of our products and technologies are customizable for new military programs and commercial applications.



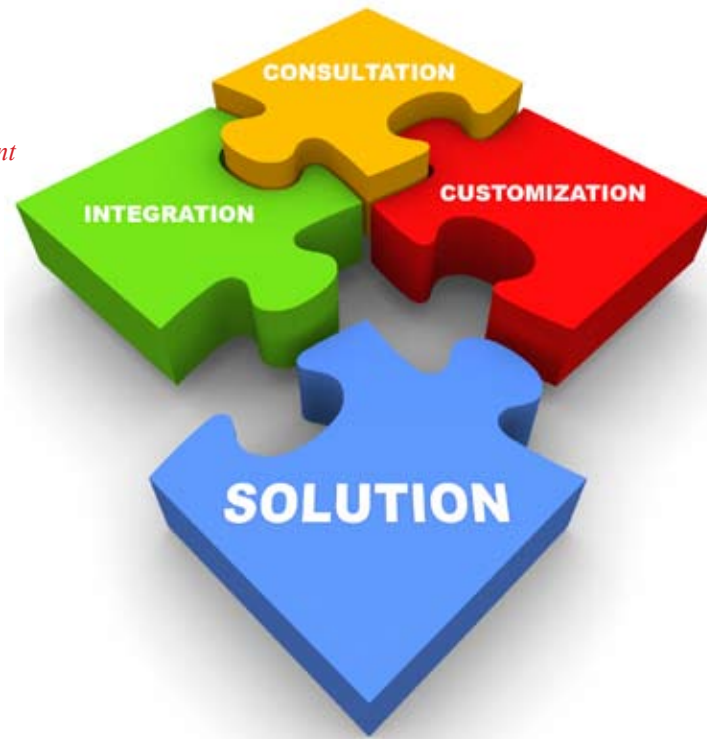
visit the website: www.gigatronics.com/components or ask your Giga-tronics representative for our components catalog

SERVICE

Finding Solutions...

... the experts for RF/Microwave Test & Measurement

Giga-tronics offers unmatched engineering and technical expertise to help you gain the maximum return on your investment. At Giga-tronics, we understand the challenges you face. We help you achieve both top-line growth and bottom-line efficiencies by working to identify your precise needs and implement smart and result orientated solutions. Our support services are tailored to assist your team with integration and next-generation product and process technology.



SUPPORT

Repair Service

All repairs are certified and traceable to NIST, and include calibration to published factory specifications

- ISO-9001:2008 with AS9100 Certification
- Repair Record Retention
- 90-day Repair Warranty
- Factory-authorized Hardware, Firmware, and Software Upgrades, as applicable



Calibration Services

All calibrations are processed in full accordance with ANSI-Z-540-1 1994, ISO 10012, and MIL-STD-45662

- Calibrations Performed Against Same Specifications Used in Original Manufacturing of the Instrument
- All Test Equipment is Traceable to NIST
- ISO-9001:2008 with AS9100 Certification
- Adjustment as Necessary
- Certificate of Calibration with List of Standards is Supplied
- Calibration Sticker with Next Calibration Due Date is Supplied
- Calibration Seal is Affixed to the Instrument
- Calibration Test Data Report



ONLINE RESOURCES

Visit us online at www.gigatronics.com for technical support, detailed information about our products, and more...



- Technical Papers
- Application Content
- Quarterly Newsletter
- Software Downloads

CONTACT

For Quotes, Order Assistance, or Demonstration Equipment:

Please e-mail to inquires@gigatronics.com or call toll free 800.726.4442 (USA), +1 925.328.4650 (International) or locate your nearest Giga-tronics representative at www.gigatronics.com/sales

For Technical Assistance:

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