Giga-tronics

Technical Datasheet

2500B Series Microwave Signal Generators
100 kHz to 50 GHz

Ultra-Low Phase Noise and Fast-Switching Speed in a Single Unit

2500B Series Microwave Signal Generator

Signal Generator Frequency Range

The 2500B series Microwave Signal Generators include six models covering 100 kHz to 50 GHz.

Model Number	Frequency Range	RF Output Connector
2502B	100 kHz to 2.5 GHz	Type-N (F)
2508B	2 GHz to 8 GHz	Type-N (F)
2520B	2 GHz to 20 GHz	SMA (F)
2526B	2 GHz to 26.5 GHz	SMA (F)
2540B	2 GHz to 40 GHz	2.92 mm (F)
2550B	2 GHz to 50 GHz	2.4 mm (F)

Available Options

Option	Description
17A	Add Internal and External Modulation Suite (includes internal function generator)
17B	Add External Modulation Suite
18	Add 100 kHz to 2 GHz Frequency Range (10 MHz to 2 GHz with option 27) (Standard on the 2502B model)
20	Add High RF Output Power
22	Add Rear Panel RF Output Connector
23	Add Type-N RF Connector, for 2520B only
26A	Add 90 dB Mechanical Step Attenuator, for 2502B, 2508B, and 2520B models
26B	Add 90 dB Mechanical Step Attenuator, for 2526B model only
26C	Add 90 dB Mechanical Step Attenuator, for 2540B model only
26D	Add 90 dB Mechanical Step Attenuator, for 2550B model only
27	Add 110 dB Electronic Step Attenuator, for 2502B and 2508B only
28A	Add Low Phase Noise
28B	Add Ultra-Low Close-in Phase Noise
29	Add Fast Frequency Switching Speed
31	Add minimum Pulse Width > 100 ns
44	Replace Standard Front Panel with Blank Front Panel (Requires Option 22)
46	Add Rack Slide Kit

The new 2500B series now give you more options to configure the Microwave Signal Generator to your specific application, while still loaded with standard features such as high stability time base and high leveled output power with low harmonics.

Advanced Synthesizer Technology

The 2500B series Microwave Signal Generators provide state-of-the-art performance with fast switching speed (option 29) and high output power (option 20) without any compromise in signal purity. The 2500B utilizes Giga-tronics' patented Accumulator High Frequency Feedback (AHFF™) technology that delivers fast switching speed along with ultra-low phase noise performance of -90 dBc/Hz @ 100 Hz, -102 dBc/Hz @ 1 kHz and -108 dBc/Hz @ 10 KHz offset on a 10 GHz carrier frequency (option 28), and very low harmonics, sub-harmonics and spurious.

High Output Power with Low Harmonics

The 2500B series Microwave Signal Generators provide high power exceeding +20 dBm to 20 GHz with low harmonics (option 20). The 2500B offers a programmable step attenuator option that, along with high precision frequency compensated automatic level control (ALC), gives a dynamic range from +20 dBm to -100 dBm, and a new electronic step attenuator option with the 2502B and 2508B models.

High Stability Time Base And Stable Phase Tracking

A standard ovenized crystal oscillator in the 2500B Series offers a high stability time base to satisfy most stringent requirements in terms of time base aging and accuracy. Furthermore, the 2500B accepts both a 10 MHz and 100 MHz external reference that automatically disconnects the internal 10 MHz reference oscillator and phase locks it with the internal 100 MHz reference oscillator. In addition, the ability to share a reference frequency between two sources at 100 MHz rather than 10 MHz leads to much greater stability (time and temperature) for phase tracking multiple synthesizers.

Digital High Rate Sweep Modes Are Standard

The 2500B Series is loaded with digital high rate sweep modes that allow the output frequency to sweep linearly between a pre-determined start and stop frequency. In addition, the 2500B Series signal generator interfaces seamlessly with the Giga-tronics 8003 Precision Scalar Analyzer for swept stimulus/response measurements such as gain, isolation, and return loss of components such as amplifiers, isolators/circulators, filters, converters etc.

Fast Frequency Switching

The fast frequency switching of the Giga-tronics 2500B series Microwave Signal Generators pays dividends in any test environment where large amounts of data are collected. Regardless of the complexity of your application, such as antenna characterization or RFIC testing, the 2500B Series will quickly prove itself as your best test investment by providing fast settling time for both amplitude and frequency.

Power Offset and Power Slope

The Power Offset feature increases the instrument's output power by the amount of the Power Offset setting, without changing the power level shown in the display. This allows you to compensate for the insertion or conversion loss of components that are attached to the instrument's RF output. The Power Slope feature increases the instrument's output power linearly as a function of the frequency. The Power Slope function allows you to automatically compensate for insertion or conversion loss of components attached to the instrument's RF output that exhibit a linear loss with frequency.

Giga-tronics offers several microwave power amplifiers as accessories to our microwave signal generators for applications requiring power up to 10 Watts to 10 GHz, 5 Watts to 20 GHz, 1/2 Watt to 40 GHz and 1/4 Watt to 50 GHz.

Faster to Program

Every 2500B series Microwave Signal Generator comes with Giga-tronics Automation Xpress, a PC based software package designed for enhanced user interface and automatic test systems. Automation Xpress leverages industry leading software applications, familiar Windows drop-down menus, and other functions to perform tasks. Using Windows-based applications, such as Microsoft™ Excel or Notepad, engineers can create, manage, and download complex lists in seconds.

Automation Xpress Interface

The 2500B Series offers unmatched frequency and power switching in list mode. However, this approach may not be suitable in some remote programming situations. For these cases, Automation Xpress offers fast remote operation that goes beyond just fast frequency switching. Automation Xpress ensures unmatched CW frequency and power switching performance, providing fast and flexible data exchange rates for faster testing and more device throughput.

Simpler to Operate

The 2500B Series is designed to streamline user navigation by moving complex testing functions from the front panel to the desktop PC. The result is a ground breaking system that reduces training time, speeds workflow, and dramatically boosts end-user productivity. To enhance user navigation, we minimized the number of soft screens and menu layers, simplifying content and improving operational performance. That means you will spend less time scrolling through menus and more time getting your work done.

Optimized for ATE

With the 2500B Series, ATE integrators now have a system source specifically designed to match their unique performance needs. The 2500B Series works seamlessly with other instruments. It includes hardware triggering and synchronization signals with programmable delays to allow coordination with other test products in your system. Replacing older industry-standard microwave synthesizers can also be accommodated, making the 2500B Series an ideal choice for upgrading older systems.

Compatibility

The Giga-tronics 2500B series has full command compatibility with the 2400 series and previous generation signal generators from Giga-tronics allowing easy upgrading to the latest technology. The 2500B series signal generators have also been successfully deployed in upgrade situations where the original generator was from another manufacturer by using the standard command set emulation included for many popular legacy signal generators. Contact the factory for more information.

Two Year Calibration Cycle

A two-year calibration cycle significantly reduces your calibration downtime.

2500B Series
Technical Specifications

Frequency

Range (with option 18)	**2502B**	100 kHz to 2.5 GHz
	2508B	100 kHz to 8 GHz
	2520B	100 kHz to 20 GHz
	2526B	100 kHz to 26.5 GHz
	2540B	100 kHz to 40 GHz
	2550B	100 kHz to 50 GHz
Frequency Accuracy	Same as time base	
Frequency Resolution	0.001 Hz	
Power Slope	0 to 0.5 dB/GHz	

Frequency Stability

Internal Reference Output	**10 MHz**	TTL level into 50 Ω
	100 MHz	> +5 dBm square wave into 50 Ω
Aging Rate [1]	< 5 x 10^{-10}/day	
Temperature Stability [2]	< ± 2.5 x 10^{-8}	
External Reference Frequency Input	**Frequency**	10 MHz or 100 MHz
	Frequency Deviation	± 1 ppm
	Recommended Input Level	> -5 dBm into 50 Ω for 10 MHz
		> +5 dBm to < +8 dBm into 50 Ω for 100 MHz
Reference Tuning	**Voltage Range**	0 to 10V
	Sensitivity	2 ppm/V nominal
		0.2 ppm/V nominal with option 28
Lock/Level Indicator (CW Mode Only)	Sync Out = +5 V (TTL High)	

Frequency Bands

Band	Frequency	N
0	0.1 to ≤ 10 MHz	N/A
1	> 10 to ≤ 15.625 MHz	512
2	> 15.625 to ≤ 31 MHz	256
3	> 31 to ≤ 63 MHz	128
4	> 63 to ≤ 125 MHz	64
5	> 125 to ≤ 250 MHz	32
6	> 250 to ≤ 500 MHz	16
7	> 500 to ≤ 1000 MHz	8
8	> 1 to ≤ 2 GHz	4
9	> 2 to ≤ 4 GHz	2
10	> 4 to ≤ 10.1 GHz	1
11	> 10.1 to ≤ 20.2 GHz	1/2
12	> 20.2 to ≤ 39.6 GHz[3]	1/4
13	> 39.6 to ≤ 50 GHz	1/6

[1] After 30 days
[2] Temperature stability over operating range of 0°C to +55°C after 30 days
[3] Band 12 frequency range extends to 40 GHz for model 2540B

Maximum Leveled Output Power in dBm

Specification applies over 0 °C to 35 °C range and degrades < 2 dB from 35 °C to 55 °C

Number in ( ) is for instruments with step attenuator option 26

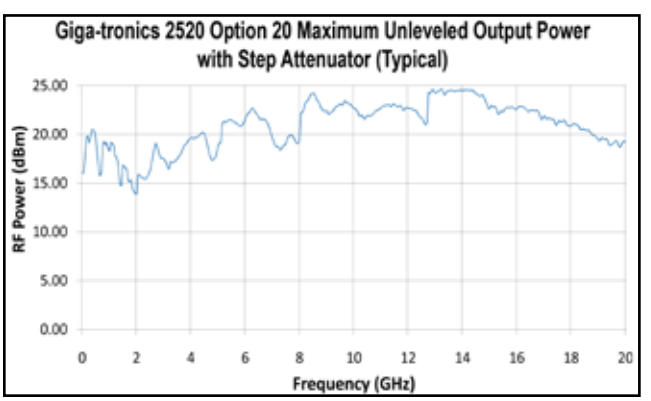
Model	0.1 to 10 MHz	0.01 to 2 GHz	2 to 8 GHz	8 to 20 GHz	20 to 26.5 GHz	26.5 to 40 GHz	40 to 50 GHz
2502B[4]	10 (9)	12 (11)	N/A	N/A	N/A	N/A	N/A
2508B	10 (9)	12 (11)	14 (13)	N/A	N/A	N/A	N/A
2520B	10 (9)	12 (11)	14 (13)	14 (12)	N/A	N/A	N/A
2526B	10 (9)	11 (10)	11 (10)	11 (9)	10 (8)	N/A	N/A
2540B[5]	10 (9)	11 (10)	11 (10)	11 (9)	10 (8)	10 (8)	N/A
2550B[5,6]	10 (9)	11 (10)	5 (4)	5 (3)	5 (3)	5 (3)	5 (3)
2502B, 2508B (option 27)	N/A	7	7	N/A	N/A	N/A	N/A

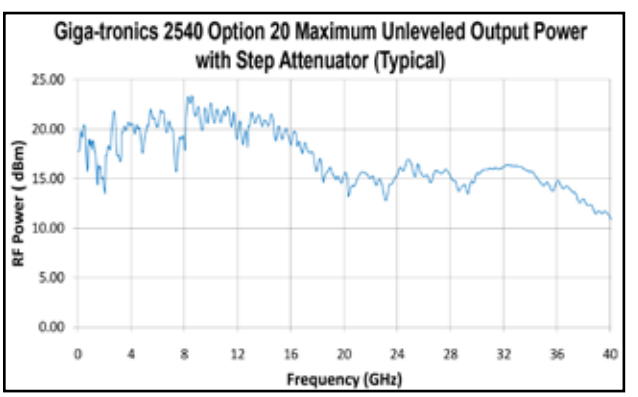
Option 20 Maximum Leveled Output Power in dBm

Specification applies over 0 °C to 35 °C range and degrades < 2 dB from 35 °C to 55 °C

Number in ( ) is for instruments with step attenuator option 26

Model	0.1 to 10 MHz	0.01 to 2 GHz	2 to 8 GHz	8 to 20 GHz	20 to 26.5 GHz	26.5 to 40 GHz	40 to 50 GHz
2502B[4]	10 (9)	14 (13)	N/A	N/A	N/A	N/A	N/A
2508B	10 (9)	14 (13)	17 (16)	N/A	N/A	N/A	N/A
2520B	10 (9)	14 (13)	17 (16)	20 (18)	N/A	N/A	N/A
2526B	10 (9)	14 (13)	12 (11)	15 (13)	11 (9)	N/A	N/A
2540B[5]	10 (9)	14 (13)	12 (11)	15 (13)	11 (9)	11 (9)	N/A
2550B[5,6]	10 (9)	14 (13)	12 (11)	15 (13)	15 (13)	15 (13)	11 (9)
2502B, 2508B (option 27)	N/A	10	10	N/A	N/A	N/A	N/A





[4] Specification for model 2502B applies to its maximum frequency of 2.5 GHz
[5] Model 2540B and 2550B maximum leveled output power is specified down to 1 MHz only
[6] Model 2550B frequency crossing is at 39.6 GHz instead of 40 GHz
[7] Specification for model 2502B applies to its maximum frequency of 2.5 GHz
[8] Model 2550B frequency crossing is at 39.6 GHz instead of 40 GHz only

Minimum Leveled Output Power in dBm

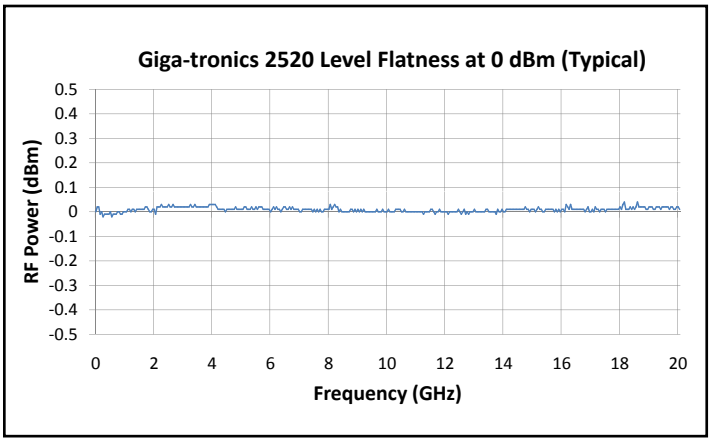
Specification applies over 0 °C to 35 °C range and degrades < 2 dB from 35 °C to 55 °C

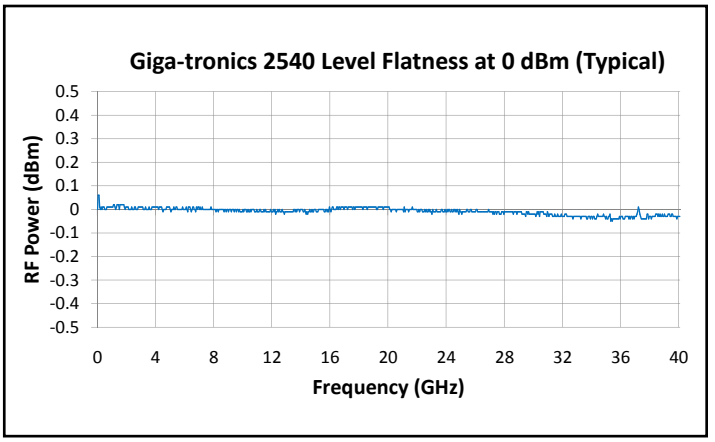
Number in ( ) is for instruments with step attenuator option 26

Model	0.1 to 10 MHz	0.01 to 2 GHz	2 to 8 GHz	8 to 20 GHz	20 to 26.5 GHz	26.5 to 40 GHz	40 to 50 GHz
2502B[7]	-13 (-103)	-10 (-100)	N/A	N/A	N/A	N/A	N/A
2508B	-13 (-103)	-10 (-100)	-10 (-100)	N/A	N/A	N/A	N/A
2520B	-13 (-103)	-10 (-100)	-10 (-100)	-10 (-100)	N/A	N/A	N/A
2526B	-13 (-103)	-10 (-100)	-10 (-100)	-10 (-100)	-10 (-100)	N/A	N/A
2540B	-13 (-103)	-10 (-100)	-10 (-100)	-10 (-100)	-10 (-100)	-10 (-100)	N/A
2550B[8]	-13 (-103)	-10 (-100)	-10 (-100)	-10 (-100)	-5 (-95)	-5 (-95)	-5 (-90)
2502B, 2508B (option 27)	N/A	(-127)	(-127)	N/A	N/A	N/A	N/A

Other Output Power Specifications

Power Offset (CW Mode)	0 to 10 dB
Power Resolution	0.05 dB
Temperature Stability	0.025 dB/°C
Output Source Match (ALC on)	< 2.0:1 to 50 GHz

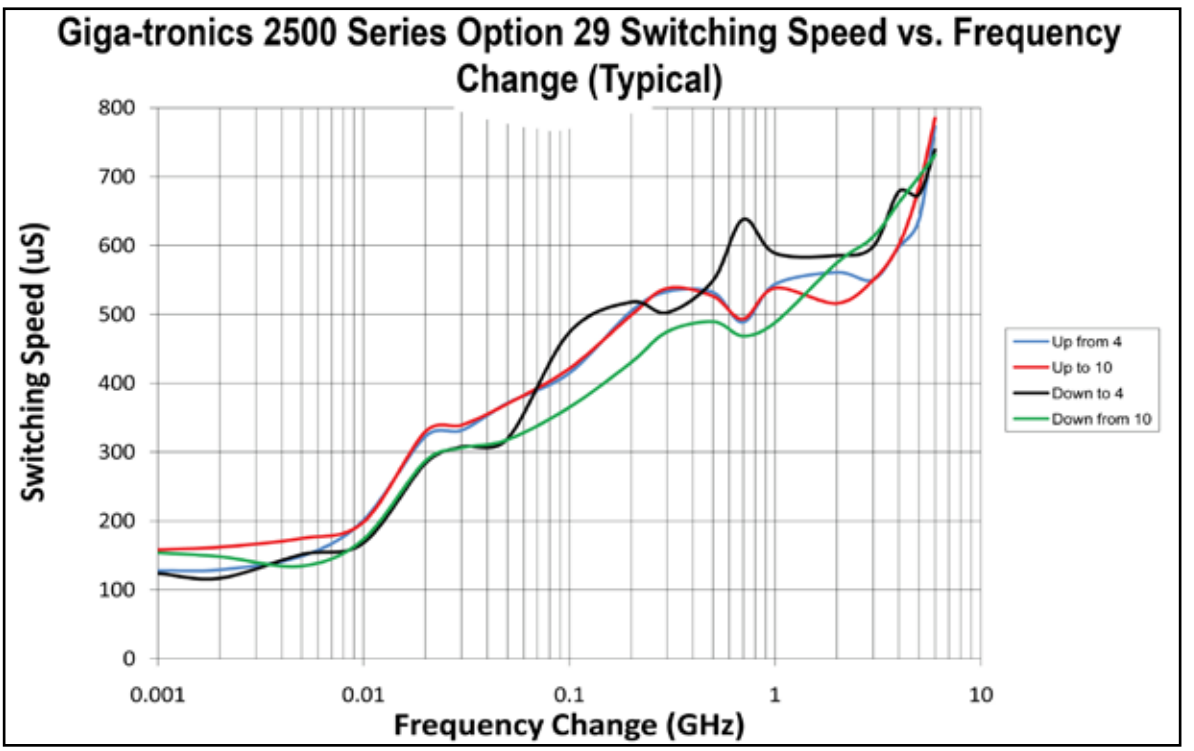




RF Power Level Accuracy (dB)

Specifications apply over 15 °C to 35 °C range and degrades < 0.1 dB/°C outside that range

Frequency Range	> +5 dBm	+5 to > -10 dBm	-10 to -90 dBm[9]
1 MHz to 20 GHz	± 0.85	± 0.7	± 1.2
20 to 39.6 GHz	± 1.05	± 0.9	± 1.5
39.6 to 50 GHz	± 1.3	± 0.9[10]	± 2.5
10 MHz to 8 GHz (with option 27)	± 1.05	± 0.9	± 1.5



[9] Specification does not apply without a step attenuator. Level accuracy at minimum leveled power typically less than ±1.5 dB without a step attenuator

[10] Minimum specified power level is -5 dBm

Frequency and Power Sweep

Ramp Frequency Sweep	Full Frequency Coverage
Frequency Sweep Modes	Start/Stop or Center/Span
Frequency Sweep Resolution	401, 801, 1601 points
Analog Sweep Mode	Provides very fine resolution sweep, for use with scalar network analyzers
Ramp Power Sweep	0 to 25 dB
Power Slope (CW Mode, List Mode)	0 to 0.5 dB/GHz
Ramp Output	0 to 10V and 0.5 V/GHz (2502B, 2508B, 2520B) or 0.25 V/GHz (2526B, 2540B, 2550B)
Z-Axis Blanking	+5V (Positive Only)
Sweep Time[11]	100 ms to 200 sec
Markers	5 intensity markers and 5 amplitude markers

List Mode

Number of Points	4000	
Frequency Settling[12]	2 ms minimum	
Frequency Settling[12] **Option 29**	< 550 µs for ΔF ≤ 500 MHz	
Amplitude Settling[13]	< 500 µs	
Digital Sweep	**Trigger Modes**	External, GPIB GET, Software
	Sweep Modes	Continuous, Single Step, Single Sweep
Step Time	**Option 29**	150 µs to 1 sec
	Standard	2 ms to 1 sec
Sync Out Delay[14]	50 µs to 10 ms	

Remote Programming

Hardware Interface	GPIB (IEEE 488.2), RS-232, USB 2.0 (full speed, not high speed), Ethernet		
Software Interface (Standard)	SCPI, GT12000, GT9000, GT900, GT7000, GT6000, Automation Xpress Interface		
Execution Speed (IEEE 488.2)		**AXI**	**SCPI**
	CW Switching (typ)	2.5 ms	28 ms
	4000 Point List Download (typ)	20 sec	28 sec
Automation Xpress	20 MB Disk Space		
Remote Interface	GPIB (IEEE 488.2, 1987), RS-232, USB 2.0, Ethernet		

Emulation Modes

The Giga-tronics 2500B series Microwave Signal Generators has full command compatibility with previous generation signal generators from Giga-tronics. In addition, the 2500B series signal generators have been successfully deployed in upgrade situations where the original signal generator was from another manufacturer by using the standard command set emulation included for many popular legacy signal generators. Basic emulation is included, and when emulating another signal generator, is limited to the capabilities, parameters and resolutions of the emulated instrument. For further support based on your specific test requirements, please contact the factory. Emulation modes is just one tool in the set of Giga-tronics' legacy signal generator replacement services.

Save and Recall

The Save and Recall functions allow saving the current state of the instrument to non-volatile memory, so that the saved state can subsequently be restored. The 2500B contains ten registers, numbered 0 through 9, in which instrument states can be saved. These saved states are preserved until over-written or erased.

[11] Sweep Rate must be <500 MHz/msec

[12] Time for frequency to settle within 50 kHz of final value after a frequency switch

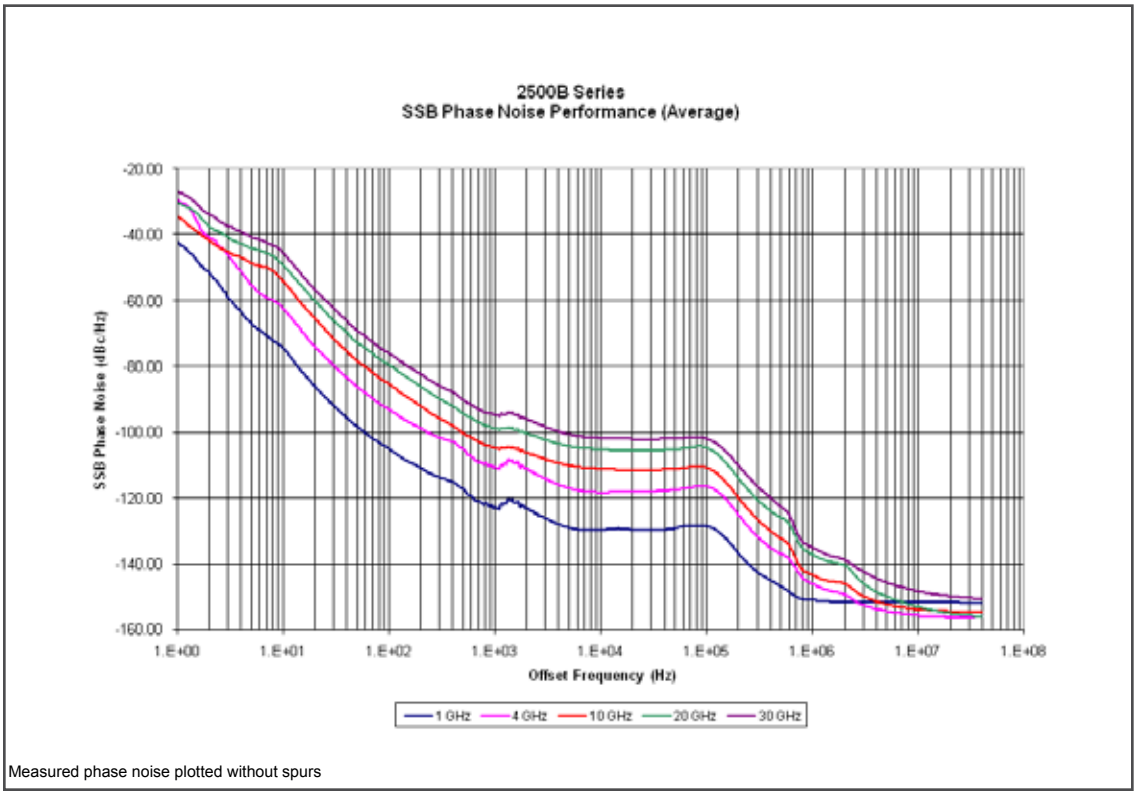
[13] Time for amplitude to settle within 0.1 dB of final value after an amplitude switch

[14] Delay is specified from edge of trigger pulse

Spectral Purity

Harmonics	**Maximum leveled output power or +10 dBm, whichever is lower. Specification for harmonics above instrument frequency range are typical**	
	100 kHz to 10 MHz	-30 dBc
	> 10 MHz to 100 MHz	-40 dBc[15]
	> 100 MHz to 39.6 GHz[16]	-50 dBc
	> 39.6 to 50 GHz	-30 dBc (typical)
Sub-Harmonics	**Maximum leveled output power or +10 dBm, whichever is lower. Specification for sub-harmonics above instrument frequency range are typical**	
	100 kHz to 2.0 GHz	-80 dBc
	> 2 to 20.2 GHz	-60 dBc
	> 20.2 to 50 GHz	-40 dBc
Spurious	**Specification is for offsets > 300 Hz. Specification is -45 dBc + 20 log(1/N) dBc typical for offsets < 300 Hz**	
	100 kHz to 10.1 GHz	-66 dBc
	> 10.1 to 20.2 GHz	-60 dBc
	> 20.2 to 39.6 GHz	-54 dBc
	> 39.6 to 50 GHz	-50 dBc
Residual FM (typical)	**50 Hz to 15 kHz Bandwidth**	
	100 kHz to 20.2 GHz	< 6 Hz
	> 20.2 to 39.6 GHz[16]	< 12 Hz
	> 39.6 to 50 GHz	< 18 Hz
AM Noise (typical)	**Offset > 5 MHz at maximum leveled power. Applies in CW only**	
	100 kHz to 2 GHz	-130 dBm/Hz
	> 2 to 20.2 GHz	-145 dBm/Hz
	> 20.2 to 50 GHz	-132 dBm/Hz

[15] Specification is -35 dBc for frequencies < 50 MHz on 2550B model only
[16] Specification for model 2540B extends to 40 GHz



Measured phase noise plotted without spurs

SSB Phase Noise - Standard

- 106 dBc/Hz at 10 GHz and 10 KHz offset from carrier

SSB Phase Noise - Option 28A

Carrier	Offset from Carrier (dBc/Hz)				
CW (GHz)	**100 Hz**	**1 kHz**	**10 kHz**	**100 kHz**	**1 MHz**
1.0	-96	-109	-121	-121	-147
4.0	-84	-94	-111	-109	-139
10.0	-74	-96	-106	-105	-135
20.0	-68	-88	-99	-99	-123
30.0	-67	-79	-96	-96	-124

SSB Phase Noise - Option 28B

Carrier	Offset from Carrier (dBc/Hz)						
CW (GHz)	**1 Hz**	**10 Hz**	**100 Hz**	**1 kHz**	**10 kHz**	**100 kHz**	**1 MHz**
1.0	-55	-77	-100	-118	-124	-124	-150
4.0	-43	-67	-90	-108	-114	-112	-142
10.0	-35	-60	-83	-100	-109	-108	-138
20.0	-29	-54	-77	-94	-102	-102	-126
30.0	-23	-48	-71	-88	-99	-99	-127

Frequency Modulation[17]

(Specification applies for frequencies above 10 MHz)

Low Rate	**Modulation Index**	Deviation Limited
	Rate (3 dB bandwidth)	DC to 750 kHz
	Peak Deviation	1.5 MHz/N
	Accuracy	**± 5% at 5 kHz rate with 1 V peak input, 12.024 kHz/V sensitivity**
	Input Range	± 1V
	Input Impedance	50 Ω
High Rate	**Modulation Index**	< 25/N
	Rate (3 dB bandwidth)	750 kHz to 5 MHz
	Peak Deviation	15 MHz/N
	Accuracy	± 5% at 1 MHz rate with 1 V peak input, 2.4048 MHz/V sensitivity
	Input Range	± 1V
	Input Impedance	50 Ω

Phase Modulation

(Specification applies for frequencies above 10 MHz)

Rate (3 dB Bandwidth)	100 Hz to 100 kHz
Peak Deviation	10 rad-pk/N
Accuracy	± 5% at 1 kHz rate with 1 V peak input, 3.83 rad/Vpk sensitivity

Pulse Modulation

(Specification applies for frequencies above 500 MHz)

Standard Operating Modes	Internal, External	
On/Off Ratio[18]	> 80 dB minimum, 90 dB nominal	
Rise/Fall Times	**0.5 to 20 GHz**	< 10 ns max, 3 ns typ.
	20 to 50 GHz	< 25 ns max, 10 ns typ.
Minimum Leveled Pulse Width[19]	**Internal / External**	100 ns
Minimum Unleveled Pulse Width[20]	**Open-Loop Calibrated**	25 ns, 10 ns nominal
Level Accuracy[21]	**Pulse Width > 350 ns**	± 0.5 dB
	Pulse Width > 100 to 350 ns	+1.5 / - 0.5 dB
	Pulse Width > 25 to 100 ns	+2.5 / - 0.5 dB
PRF (50% Duty Cycle)	**Leveled**	< 3 MHz
	Open-Loop Calibrated	< 10 MHz
Pulse Fidelity	**Video Feed Through**	0.5 to 2 GHz: < 5%
		2 to 50 GHz: < 1%
	Compression	< ± 5 ns
	RF Delay	< 75 ns
Input	**Sensitivity**	TTL levels (polarity selectable)

[17] Settling time not specified with FM turned on

[18] Specification for model 2502B applies up to a frequency of 2.0 GHz.

[19] Two modes for pulse modulation exist. In one mode the ALC is always "ON" and automatically maintains the pulse amplitude accuracy for pulse widths as narrow as 350 ns over the full amplitude range, or as narrow as 100 ns at maximum leveled output power. The other mode provides accurate power output for pulses as low as 10 ns. Whenever RF is turned on, or the frequency or power settings are changed, the ALC turns on the RF on for 1 millisecond to calibrate the output power. After this initial calibration leveling is completed, the RF is turned off and pulse operation resumes. Also in this mode the ALC automatically reengages leveling whenever the pulse width exceeds 1 µs. This provides automatic closed loop leveling for pulse widths greater than 1 µs while still providing accurate output power for pulse widths as low as 10 ns

[20] Unleveled pulse widths as narrow as 10 nS can be achieved as nominal but not guaranteed performance

[21] Duty Cycle must be >0.01%

Amplitude Modulation[22]

(Specification applies for frequencies above 10 MHz)

Depth	0 to 90% (Level = 0 dBm)	
Rate (3 dB Bandwidth at carrier level of 0 dBm)	DC to 100 kHz (Depth = 50%)	
Sensitivity	0 to 95% per Volt, selectable	
Accuracy	± 10% of setting at 1 kHz rate	
Input	**Range**	± 1V
	Impedance	600 Ω

Internal Function Generator

AM Modulation Source	**Waveforms**	Sine, Square, Triangle, Ramp, Gaussian Noise
	Rate	0.01 Hz to 100 kHz, all waveforms
	Resolution	0.01 Hz
	Accuracy	Same as time base
	AM Out	2 V peak to peak into 10 kΩ load
FM Modulation and Phase Modulation Source	**Waveforms**	Sine, Square, Triangle, Ramp
	Rate	0.01 Hz to 1 MHz, all waveforms
	Resolution	0.01 Hz
	Accuracy	Same as time base
	FM Out	2 V peak to peak into 10 kΩ load
Pulse Modulation	**Modes**	Continuous, Gated, Triggered, Pulse Burst (up to 300 pulses)
Pulse Modulation Source	**Width**	10 ns to 10 ms
	Pulse Repetition	0.2 µs to 1 sec
	Sync. Out Delay	0 to 10 ms
	Resolution	10 ns
	Accuracy	± 2% of setting or ± 15 ns, whichever is greater. ± 0.08% nominal
	Pulse Mod Out	2 V into 50 Ω

Physical

Environmental	MIL-PRF-28800F. Class 3
Safety	EN61010
Weight	< 35 lbs (15.9 kg)
Emissions	EN61326
Rack Height	3U (5.25 inches) (133.4 mm)
Dimensions (with rack handles)	19 inches (W) x 21 inches (D) x 5.2 inches (H) 483 mm (W) x 534 mm (D) x 312 mm (H)
Power	90 to 253 VAC, 47 to 440 Hz 300 Watts typical, 350 Watts max.

[22] Modulation peaks must be less than maximum available power

2500B Series Rear Panel I/O Connector Descriptions

Connector Label	Specifications	Connector Type
EXT ALC	External ALC Input	BNC
RF OUT	Rear Panel Output, option 22 only	SMA, N, 2.92 mm or 2.4 mm
FM/ ϕM OUT	Internal modulation generator output; 2 Vp-p into 10 kΩ	BNC
PULSE OUT	A +4 V video representation of the pulsed RF output signal	BNC
AM OUT	Internal modulation generator output; 2 Vp-p into 10 kΩ	BNC
PM SYNC OUT	Synchronization output pulse width > 75 ns width	BNC
FM/ ϕM IN	50 Ω, +/- 1 V maximum	BNC
AM IN	600 Ω	BNC
PULSE IN/PM TRIG IN	50 Ω, TTL levels, polarity selectable	BNC
LOCK/LEVEL	+5 V indicator for phase/level lock for CW mode and in list mode	BNC
REF TUNE	0 to +10 V	BNC
SYNC OUT	+5 V output pulse	BNC
TRIGGER IN	Used to trigger a list. Accepts a TTL level signal of > 50 ns width.	BNC
BLANKING	+5 V output indicator for band crossing, filter switching, and retraces	BNC
RAMP OUT	0 to 10 V	BNC
STOP SWP IN/OUT	+5 V, 2 kΩ, active low	BNC
V/GHz	0.5 V/GHz (2502B, 2508B, 2520B) or 0.25 V/GHz (2526B, 2540B, 2550B)	BNC
100 MHz OUT	+5 dBm typical, 50 Ω	BNC
10 MHz OUT	2 Vp-p, 50 Ω	BNC
EXT REF IN	10 MHz ± 50 Hz (> -5 dBm), 100 MHz ± 500 Hz (> +5 dBm to +8 dBm), 50 Ω	BNC
GPIB	A 24-pin IEEE STD 488.2 connector for control of the instrument during remote operation using GPIB	Type 57
RS-232	A DB-9 connector for control of the instrument during remote operation using RS-232 serial communications	DB-9
USB	USB 2.0 (Device) for control of the instrument during remote operation using USB communications	USB type B
LAN	100 Base T Ethernet for control of the instrument during remote operation using Ethernet	RJ45
AC POWER INPUT	90 to 253 VAC, auto-sensing, 47 Hz to 440 Hz	IEC Power Line

Included Accessories

The 2500B series Microwave Signal Generators include the following items: Giga-tronics AutomationXpress software (AX), Operation and Programming Manual (CD-ROM), AC Power Cord (6 feet), Combined Rack Mount and Handle Brackets, and a USB 2.0 Type A Male to Type B Male cable. .

Ordering Information

Giga-tronics has a network of RF and Microwave instrumentation sales engineers and a staff of factory support personnel to help you find the best, most economical instrument for your specific applications. In addition to helping you select the best instrument for your needs, our staff can provide quotations, assist you in placing orders, and do everything necessary to ensure that your business transactions with Giga-tronics are handled efficiently.

Model Number	Frequency Range
2502B	100 kHz to 2.5 GHz
2508B	2 GHz to 8 GHz
2520B	2 GHz to 20 GHz
2526B	2 GHz to 26.5 GHz
2540B	2 GHz to 40 GHz
2550B	2 GHz to 50 GHz

Available Options and Accessories

Option	Description
17A	Add Internal and External Modulation Suite (includes internal function generator)
17B	Add External Modulation Suite
18	Add 100 kHz to 2 GHz Frequency Range (Standard on the 2502B model)
20	Add High RF Output Power
22	Add Rear Panel RF Output Connector
23	Add Type-N RF Connector, for 2520B only
26A	Add 90 dB Mechanical Step Attenuator, for 2502B, 2508B, and 2520B models
26B	Add 90 dB Mechanical Step Attenuator, for 2526B model only
26C	Add 90 dB Mechanical Step Attenuator, for 2540B model only
26D	Add 90 dB Mechanical Step Attenuator, for 2550B model only
27	Add 110 dB Electronic Step Attenuator, for 2502B and 2508B model only (Opt. 27 limits low frequency range to 10 MHz)
28A	Add Low Phase Noise
28B	Add Ultra-Low Close-in Phase Noise
29	Add Fast Frequency Switching Speed
31	Add Minimum Pulse Width > 100 ns
44	Replace Standard Front Panel with Blank Front Panel (Requires Option 22)
46	Add Rack Slide Kit

Giga-tronics Support Services

At Giga-tronics, we understand the challenges you face. Our support services begin from the moment you call us. 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. We believe and commit ourselves in providing you with more than our superior test solutions. For technical support, contact:

Tel: 1-800-726-GIGA (4442) or (925) 328-4669
Email: support@gigatronics.com

Updates

All data is subject to change without notice. For the latest information on Giga-tronics products and applications, please visit:

http://www.gigatronics.com

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