Giga-tronics

Technical Datasheet

2520GTA RF/Microwave Signal Generator

100 MHz to 20 GHz

Fast Switching Speed that Boosts your Productivity

GT-157-E/US08000731

2520GTA
Fast Switching Microwave Signal Generator

Application

- Antenna Test and Characterization
- Radar Cross-Section Test
- EW Systems
- ATE
- Components Testing
- LO

Features

- Frequency ranges - 100 MHz to 20 GHz with 0.001Hz resolution
- Fast frequency and level switching time of < 200 µsec for ΔF_0 = 100 MHz and < 350 µsec over full frequency range
- High output power option - > +20 dBm @ 20 GHz
- Standard High Time Base Stability - Aging Rate < 5 X 10^{-10}/day & Temperature Stability < 2.5 X 10^{-8}/°C
- Digital high rate sweep modes - digital step/list sweep
- Backwards command compatible - 100% command compatibility with 2400, 2500 and legacy signal generators from Giga-tronics and other manufacturers
- Automation Xpress ™ Interface - Simplified single layer front panel menu as complex functions are controlled with Automation Xpress™
- 2 Year Calibration Cycle

Fast Frequency Switching

The 2520GTA offers frequency and amplitude switching speeds of < 500 µS for any step size over its full frequency range and typically < 300 µS for frequency steps up to 100 MHz within a band. With these industry best switching speeds, the 2520GTA will undoubtedly improve throughput and reduce the cost of testing, making it ideal for data intensive applications such as antenna characterization or high volume component testing in manufacturing environments, where test throughput must be maximized to reduce the cost of testing.

High Precision Power Output

The 2520GTA microwave signal generator, with optional high output power exceeding +20 dBm to 20 GHz, eliminates the need to use an external power amplifier and makes it ideal for measurements where low harmonics and high drive conditions are required.

High Stability Time Base and Low Residual Phase Noise

A standard ovenized OCXO oscillator in the 2520GTA offers a high stability time base to satisfy most stringent requirements in terms of time base aging and accuracy. Furthermore, the 2520GTA accepts both a 10 MHz and 100 MHz external reference that automatically disconnects the internal 10 MHz OCXO reference and phase locks it with the internal 100 MHz OCXO reference. 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) and lower residual phase noise performance.

Digital High Rate Sweep Modes

The 2520GTA 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 2520GTA 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.

Faster to Program

Every 2520GTA 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 2520GTA offers unmatched frequency and power switching in list mode. However, this approach may not be suitable in many remote programming situations. For these cases, Automation Xpress offers fast remote operation that goes beyond just fast frequency switching. Automation Xpress, combined with the Automation Xpress interface option, ensures unmatched **2.0 msec CW frequency and power switching performance**, providing fast and flexible data exchange rates for faster testing and more device throughput.

Simpler to Operate

The 2520GTA 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 data menus and more time getting your work done.

Compatibility

The 2520GTA has full command compatibility with the 2400 Series and previous generation signal generators from Giga-tronics. In addition, Giga-tronics offers optional command sets for the legacy signal generators offered by other manufacturers allowing customers to replace all the legacy signal generators with a single unit from Giga-tronics.

Two Year Calibration Cycle

A two-year calibration cycle significantly reduces your calibration downtime. In addition, Giga-tronics offers Calibration Xpress software that reduces your downtime even more by allowing you to perform you own synthesizer calibration.

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2520GTA
Technical Specifications

Frequency

Range	**2520GTA**	100 MHz to 20 GHz
Frequency Resolution	0.001 Hz	
Power Slope	0 to 0.5 dB/GHz	

Frequency Stability

Internal Reference Output	**10 MHz**	A 2 Vp-p square wave reference output signal into 50Ω
	100 MHz	+5 dBm typ. AC coupled reference output signal into 50Ω
Aging Rate (After 30 days warm period)	$< 5 \times 10^{-10}$/day (10 MHz)	
Temperature Stability (Over operating temperature range of 0°C to +55°C after 30 days warm period)	$< 2.5 \times 10^{-8}$/ °C (10 MHz)	
External Reference Frequency Input	**Frequency**	10 MHz or 100 MHz
	Frequency Deviation	± 1 ppm
	Recommended Input Level	> -5 dBm into 50Ω for 10 MHz
		> +5 dBm to < +8 dBm into 50Ω for 100 MHz
Reference Tuning	**Voltage Range**	0 to 10V
	Sensitivity	0.50 V/GHz, 0.1 - 20 GHz
Lock/Level Indicator (CW Mode Only)	Sync Out = +5 V (TTL High)	

Frequency Bands

Band	Frequency	N
0	100-125.00 MHz	64
1	125.01-250.00 MHz	32
2	250.01-500.00 MHz	16
3	500.01-1000.00 MHz	8
4	1.01-1.99GHz	4
5	2.00-3.99 GHz	2
6	4.00-7.99 GHz	1
7	8.00-15.99 GHz	1/2
8	16.00-20.00 GHz	1/4

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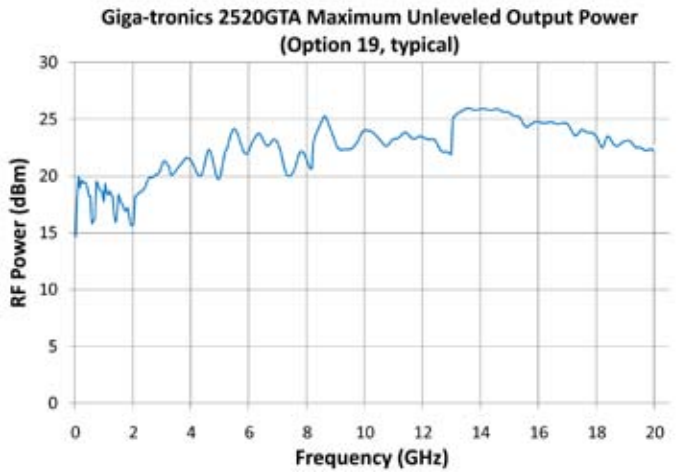
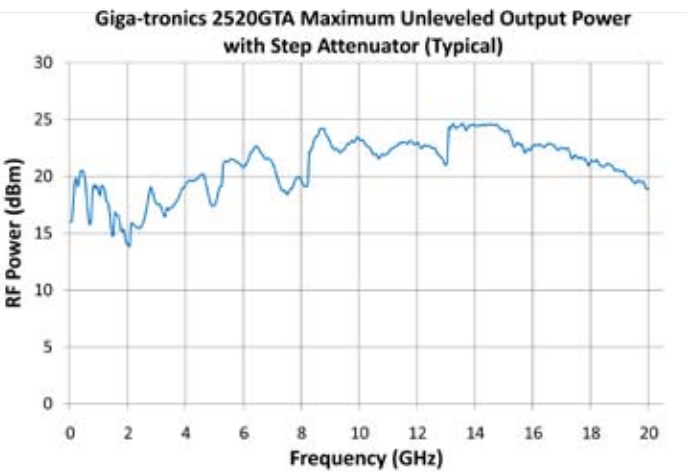
Maximum Leveled Output Power

(Specification applies over 0 to 35°C range and degrades <2.0 dB from 35°C to 55°C)

Model	0.1-2 GHz (with step attenuator)	2-8 GHz (with step attenuator)	8-20 GHz (with step attenuator)
2520GTA	14 dBm (13 dBm)[1]	14 dBm (13 dBm)[1]	14 dBm (11.5 dBm)[1]
2520GTA (Option 19)	14 dBm (13.2 dBm)[1]	17 dBm (15.8 dBm)[1]	20 dBm (17.5 dBm)[1]



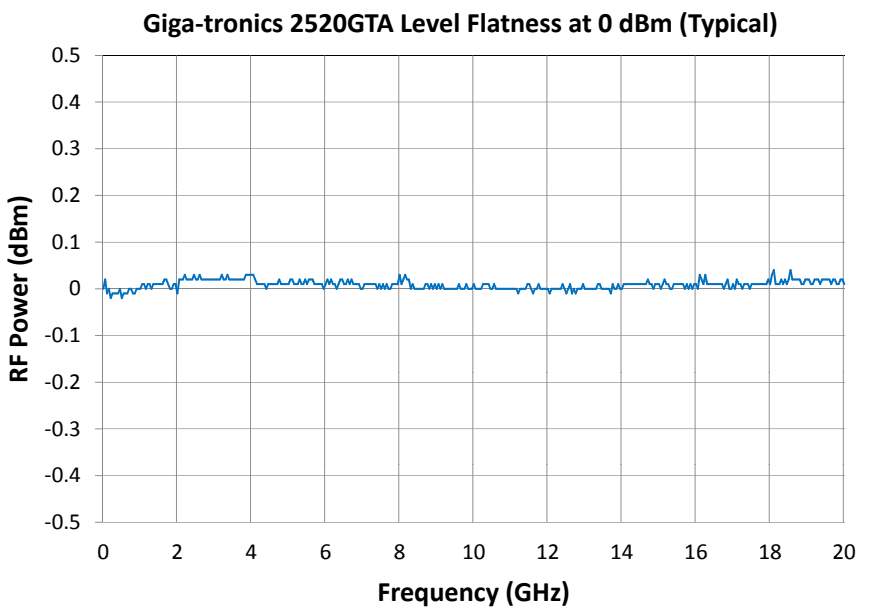


Minimum Settable Level	**Standard Model**	-110 dBm
	Option 26	-20 dBm
Power Offset (CW Mode)	0 to 10 dB	
Power Resolution	0.05 dB	
Temperature Stability	0.025 dB/°C	
Output Source Match (ALC on)	< 2.0:1 to 20 GHz	

Accuracy (dB)

(Specifications apply over 15 to 35°C range and degrades < 0.10 dB/°C outside the range)

Frequency Range	> 5 dBm	> -10 dBm	> -100 dBm [2]
100 MHz - 20 GHz	± 0.85	± 0.7	± 1.2



1. Power in parenthesis includes step attenuator insertion loss.
2. Does not apply with option 26. Level accuracy at -17 dBm is typically less than ±1.5 dB without step attenuator.

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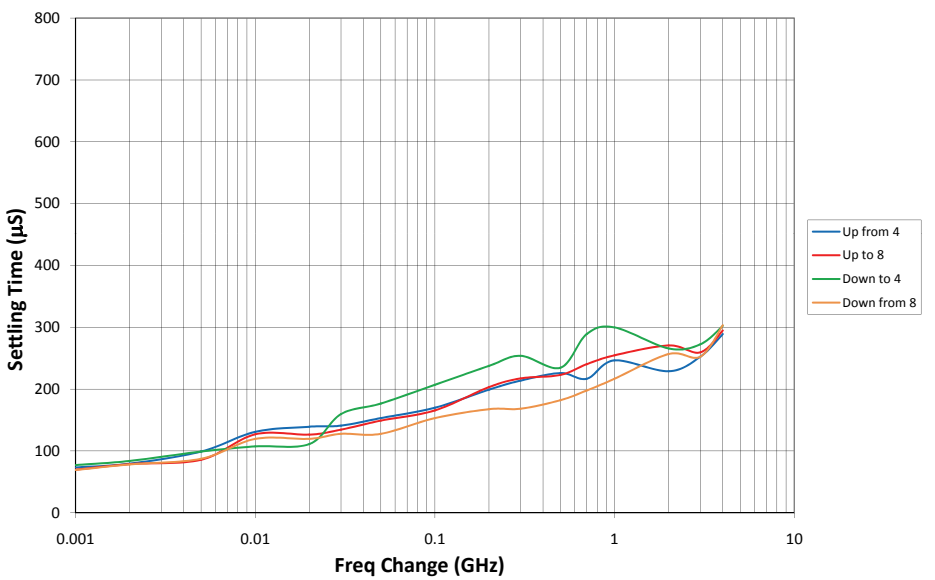
Frequency and Power Sweep

Ramp Frequency Sweep	Full Frequency Coverage
Ramp Power Sweep	0 to 25 dB
Power Slope (CW Mode, List Mode)	0 to 0.5 dB/GHz
Ramp Output	0 to 10V
Z-Axis Blanking	+5V (Positive Only)
Sweep Time[3]	100 msec - 200 sec

List Mode

Number of Points	4000	
Frequency Settling[4] (Inside band Frequency Range)	< 350 µsec	
Amplitude Settling[5] (Within step attenuator hold range)	< 350 µsec	
Digital Sweep	**Trigger Modes**	External, GPIB GET, Software control
	Sweep Modes	Continuous, Single Step, Single Sweep
Step Time	**Standard**	150 µsec - 1 sec
	Option 31	2 msec - 1 sec
Sync Out Delay[6]	50 µsec - 10 msec	

Giga-tronics 2520GTA Frequency Settling (Typical)



Spectral Purity

Harmonics	**Max level or +10 dBm, whichever is lower (specification for harmonics above instrument frequency range are typical)**	
	0.1 - 20 GHz	-50 dBc
Sub-Harmonics	**Max level or +10 dBm, whichever is lower**	
	0.1 - 20 GHz	-50 dBc
Spurious	**Specification is -45 dBc typical for offsets < 300 Hz from carrier**	
	0.1 - 20 GHz	-50 dBc

[3]Sweep Rate must be < 500 MHz/msec.
[4]Time for frequency to settle within 50 kHz of final value after a frequency switch. From 15° C to 35° C.
[5]Time for amplitude to settle within 0.1 dB of final value after an amplitude switch.
[6]Delay is specified from edge of trigger pulse.

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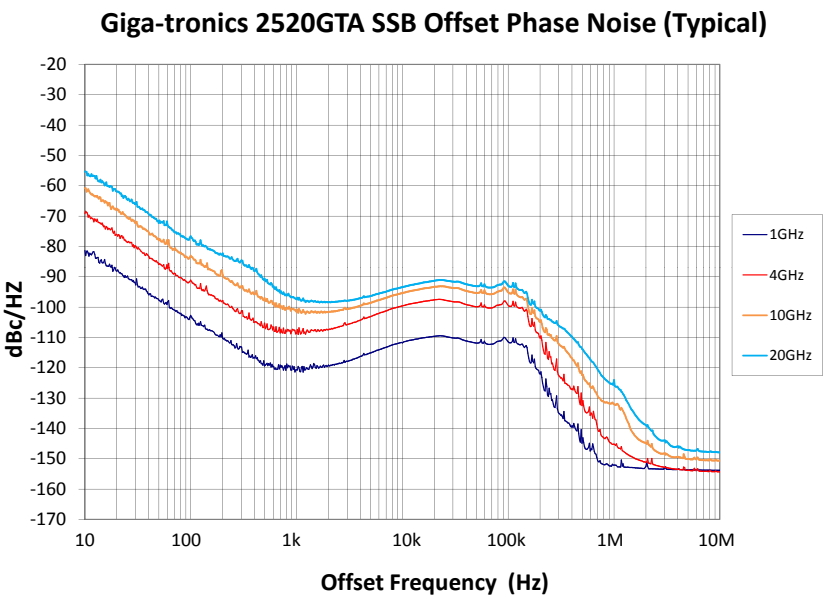
SSB Phase Noise

Carrier Frequency	Offset from Carrier (dBc/Hz)					
CW (GHz)	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz
1.0	-66	-88	-111	-111	-112	-147
4.0	-59	-82	-94	-99	-100	-137
10.0	-50	-74	-87	-89	-90	-128
20.0	-44	-70	-85	-89	-90	-112



Pulse Modulation (Option 17C)

(Specification applies for frequencies above 500 MHz)

Standard Operating Modes	External	
On/Off Ratio	> 80 dB	
Rise/Fall Times	**0.5 - 20 GHz**	< 10 nsec
Minimum Leveled Pulse Width	**External**	100 nsec
Minimum Unleveled Pulse Width	**External**	10 nsec
Level Accuracy[7]	**Pulse Width > 250 nsec**	± 0.5 dB
	Pulse Width > 150 - 250 nsec	+ 1.5 / - 0.5 dB
	Pulse Width > 100 - 150 nsec	+ 2.5 / -0.5 dB
PRF (50% Duty Cycle)	**Leveled**	DC - 5 MHz
	Unleveled	DC - 10 MHz
Pulse Fidelity	**Video Feed Through**	< 5% (0.5 - 2 GHz)
		< 1% (2 - 20 GHz)
	Compression	< ± 5 nsec
	RF Delay	< 75 nsec
Input	**Sensitivity**	TTL levels (polarity selectable)

[7]Duty Cycle must be > 0.01%

Remote Programming

Hardware Interface	IEEE 488.2, RS-232, & USB (with supplied adapter)		
Software Interface	SCPI, GT12000, GT9000, GT900, Automation Xpress Interface (Standard)		
Execution Speed (IEEE 488.2)		**AXI**	**SCPI**
	CW Switching	2.0 msec	28 msec
	4000 Point List Download	13 sec	28 sec
Automation Xpress Interface (AXI)	For use with Giga-tronics Automation Xpress software. The AXI provides Xpress 2.0 ms CW Frequency/Power switching, faster data exchange and functional downloads/executions, and a stable API programming interface for ATE programming environment.		
Automation Xpress Requirements	20 MB Disk Space Windows 2000, Windows XP 128 MB RAM or greater		
Remote Interface	GPIB (IEEE 488.2, 1987) with listen and talk, RS-232		

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))
Connector Types	SMA(f) or Type N (f)

2520GTA Rear Panel I/O Connector Descriptions

Connector Label	Descriptions	Connector Type
EXT ALC	External ALC Input	BNC
RF OUT	Rear Panel Output	SMA, N
PULSE OUT	A +4 V video representation of the pulsed RF output signal	BNC
PM SYNC OUT	Synchronization output pulse width > 75 nsec width	BNC
PULSE IN/PM TRIG IN	+5 V, 50 Ω	BNC
LOCK/LEVEL	+5 V indicator for phase/level lock for CW mode & 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 nsec 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	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 (> -5.0 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
AC POWER INPUT	90-253 VAC, auto-sensing, 47 Hz to 440 Hz	IEC Power Line

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
2520GTA	100 MHz - 20 GHz

Available Options and Accessories

Option	Description
17C	Delete Pulse Modulation
18	Delete 100 MHz to 2 GHz
19	High Output Power
23	Type N (f) Connector
26	Delete Step Attenuator
31	2 msec Switching Speed Limit
44	Delete Front Panel Option
46	Rack Slide Kit
55A	Hewlett Packard 8370 Command Set
55B	Hewlett Packard 8340 Command Set
55C	Hewlett Packard 8673C/D Command Set
55D	Hewlett Packard 8663A Command Set
55E	Systron Donner Command Set
55F	Wavetek 90X Command Set
55G	Hewlett Packard 8350 Command Set
55H	Hewlett Packard 8360 Command Set

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

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http://www.gigatronics.com

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