

Selecting a Signal Generator

Introduction

Keysight Technologies, Inc. offers the widest selection of signal generators from baseband to 67 GHz, with frequency extensions to 1.1 THz. From basic to advanced functionality, each signal generator delivers benchmark performance in its class to address the requirements in design and manufacture of radio transceivers and their components; and applications ranging from low-frequency navigation signals, through cellular mobile radio, to millimeter wave radar, and satellite systems. Each offers synthesized frequency accuracy and stability, excellent calibrated level accuracy, and remote programmability.

Modulation capabilities vary from general-purpose AM, FM and digital I/Q to standard-specific formats such as GSM, W-CDMA, HSPA, LTE, LTE-Advanced, 5G NR, GNSS, and WLAN. Keysight provides signal generators in multiple form factors, including benchtop and modular PXI.

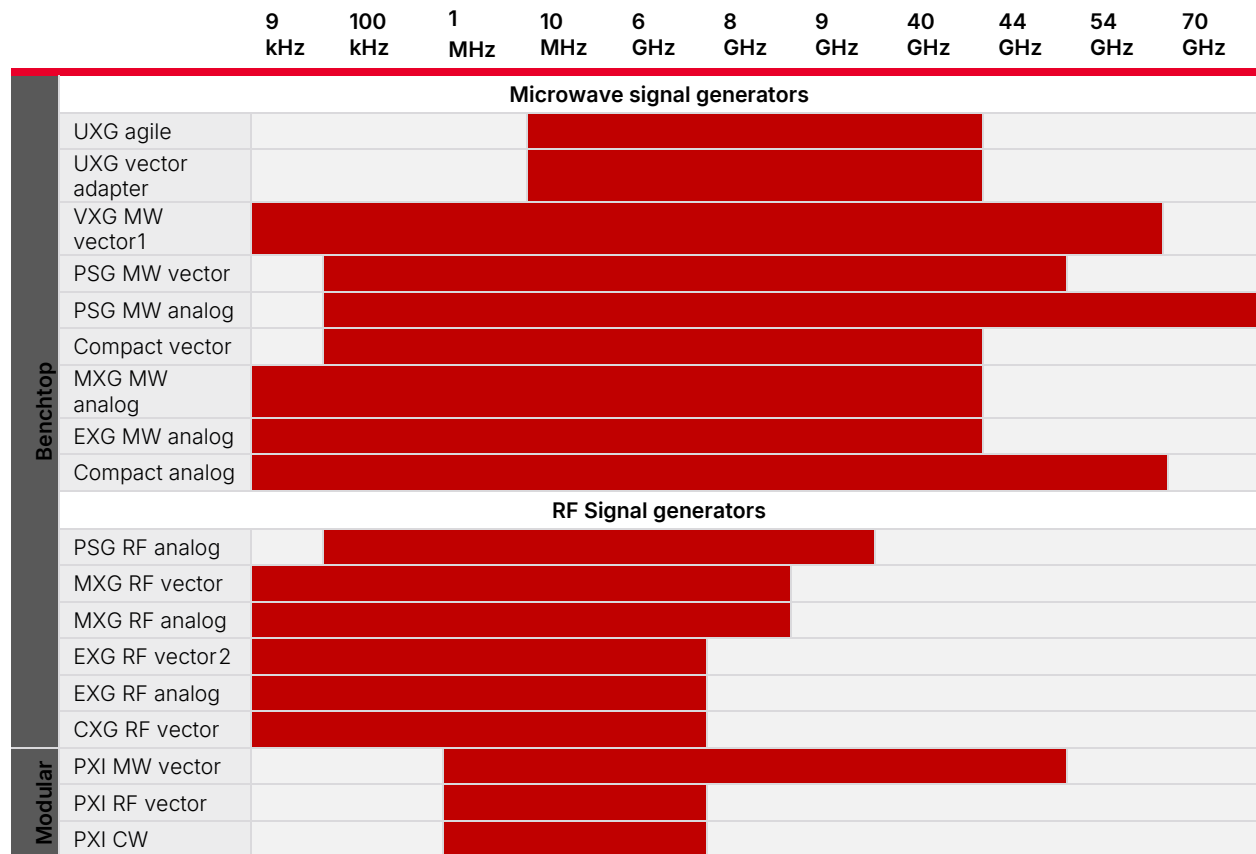
This guide provides an overview and side-by-side comparisons to help you determine which signal generator is right for you. It is intended to supplement online selection tools available at www.keysight.com/find/sg.



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Frequency Coverage for Keysight Signal Generators



1 Frequency for VXG MW vector can be extended up to 110 GHz with V3080A.

2 Frequency for MXG RF vector (N5182B) and EXG RF vector can be extended up to 7.2 GHz with N5182BX07.

Product Categories

Benchtop, Rack Mount, and Modular Signal Generators

Benchtop signal generators are well-suited for R&D or design verification, where analysis and troubleshooting benefit from interactive analysis. Benchtop models range from RF to microwave with a broad range of capabilities so you can select which generator best suits your needs.

Rack mount signal generators are high-performance, multi-channel compact signal generators designed for advanced RF and microwave test applications. Their small form factor and scalable multi-channel architecture make them ideal for space-constrained environments such as phased array, beamforming, and multi-antenna system validation. They offer excellent phase noise performance, synchronization across channels, and reduced test setup complexity, helping engineers accelerate validation cycles while maintaining measurement accuracy.

Modular PXI signal generators are ideal for applications that require multi-channel measurement capabilities, fast measurement speed, and a small footprint. They also offer scalability and flexibility to configure solutions with a shared processor, chassis, and other modular instruments. The PXI vector signal generator can be used with the same software applications as benchtop signal generators, providing measurement consistency and compatibility throughout the product development cycle.

Vector Signal Generators

Vector signal generators or digital signal generators can upconvert complex modulation formats such as QPSK and 1024QAM. With an I/Q baseband generator, virtually any signal can be emulated and transmitted within the information bandwidth supported by the system.

Analog Signal Generators

Analog signal generators supply sinusoidal continuous wave (CW) signals with optional capability to add AM, FM, Φ M and pulse modulation. The maximum frequency range for analog signal generators spans from RF to millimeter wave. Most generators feature step/list sweep modes for passive device characterization or calibration.

Agile Signal Generators

Agile signal generators are optimized for speed to quickly change frequency, amplitude, and phase of the signal. They also have the unique capability to be phase coherent at all frequencies, all of the time. This attribute, along with extensive pulse modulation and wideband chirp capabilities, is ideal for electronic warfare (EW) and radar applications.

Frequency Synthesizers

Frequency synthesizers offer a scaled-down, affordable, compact option while providing fast switching speeds, low phase noise, and high signal quality. Their compact size and multi-channel capabilities allow you to easily integrate them into the test system for various applications including radar, electronic warfare, and quantum computing.

Signal Creation Software

Signal creation software products enable the generation of a wide range of application specific test signals using vector signal generators. They can easily create signals to evaluate the performance of radio designs and the components that comprise them under various parametric and functional test conditions at baseband, RF and microwave frequencies. Keysight's PathWave Signal Generation software runs on a PC and embedded software runs directly on the signal generator.

Key Specifications Comparisons

Benchtop Vector Signal Generators

Benchtop Vector Signal Generators

Specifications ³	VXG	MXG		EXG	CXG
Model Number	M9484C	N5186A	AP5041A AP5042A	N5172B	N5166B
Performance	*****	*****	****	**	*
Number of channels	1, 2, 4	1, 2, 4	1 (41A) 1, 2, 3, 4 (42A)	1	1
Frequency range (min. to max.)	9 kHz to 54 GHz	9 kHz to 8.5 GHz	100 kHz to 40 GHz	9 kHz to 6 GHz	9 kHz to 6 GHz
Frequency switching speed	3 ms (meas)	800 μ s	\leq 5.1 μ s (meas)	800 μ s	5 ms
Sweep mode	Step, list	Step, list	Step	Step, list	Step, list
Minimum output power at 1 GHz	-110 dBm	-127 dBm	-120 dBm (meas)	-110 dBm	-110 dBm
Maximum output power at 1 GHz	+20 dBm	+25 dBm	+23 dBm (meas)	+21 dBm	+18 dBm
Level accuracy at 1 GHz	\pm 1.6 dB	\pm 0.8 dB	\pm 0.3 dB (meas)	\pm 0.6 dB	\pm 0.6 dB
SSB phase noise at 1 GHz	-148 dBc/Hz (10 kHz offset)	-146 dBc/Hz (10 kHz offset)	-142 dBc/Hz (meas) (10 kHz offset)	-122 dBc/Hz (20 kHz offset)	-119 dBc/Hz (20 kHz offset)
Harmonics at 1 GHz	-55 dBc	-35 dBc	-43 dBc (meas)	-35 dBc	-35 dBc
Non-harmonics at 1 GHz	-60 dBc	-80 dBc	-60 dBc (meas)	-72 dBc	-72 dBc
AM rate	10 Hz to 10 MHz (typ)	DC to 10 MHz (nom)	0.1 Hz to 100 MHz	DC to 50 kHz	DC to 50 kHz
Maximum FM deviation	1.25 GHz (nom)	500 MHz (nom)	200 MHz	40 MHz	40 MHz
Maximum phase deviation (normal mode)	100 rad (nom)	12 π (nom)	100 rad	20 rad	20 rad
Narrow pulse width	20 ns	20 ns	8 ns	20 ns	20 ns
Internal baseband generator RF BW	2.5 GHz	1 GHz	400 MHz	160 MHz	120 MHz
Waveform playback memory	4096 MSa	2048 MSa	334 MSa	512 MSa	512 MSa
Baseband generator mode	Waveform playback	Waveform playback	Waveform playback	Waveform playback and real-time	Waveform playback
Phase coherent frequency switching	Optional	Optional	Optional	N/A	N/A
Signal or pulse descriptor word capability	Optional	N/A	Optional	N/A	N/A

³ Refer to individual product data sheets for details.

Benchtop Microwave Analog Signal Generators

Benchtop Microwave Analog Signal Generators

Specifications ⁴	PSG		MXG	
Model Number	E8257D	AP5032A AP5031A	N5183B	AP5022A AP5021A
Performance	*****	*****	*****	*****
Number of channels	1	1 (31A) 1, 2, 3, 4 (32A)	1	1 (21A) 1, 2, 3, 4 (22A)
Frequency range (min. to max.)	100 kHz to 70 GHz	1 kHz to 51 GHz	9 kHz to 40 GHz	9 kHz to 54 GHz
Frequency switching speed	9 ms	10 μ s	600 μ s	15 μ s
Sweep mode	Step, list, ramp	Step, list	Step, list	Step, list
Minimum output power at 1 GHz	-90 dBm	-120 dBm	-90 dBm	-120 dBm
Maximum output power at 1 GHz	+24 dBm	+18 dBm	+23 dBm	+17 dBm
Level accuracy at 1 GHz	\pm 0.6 dB	\pm 0.5 dB	\pm 0.6 dB	\pm 0.8 dB
SSB phase noise at 1 GHz	-147 dBc/Hz (10 kHz offset)	-150 dBc/Hz (10 kHz offset)	-146 dBc/Hz (10 kHz offset)	-145 dBc/Hz (10 kHz offset)
Harmonics at 1 GHz	-55 dBc	-50 dBc	-33 dBc	-45 dBc
Non-harmonics at 1 GHz	-80 dBc	-75 dBc	-92 dBc	-86 dBc
AM rate	DC to 100 kHz	0.1 Hz to 30 kHz	DC to 100 kHz	0.1 Hz to 30 kHz
Maximum FM deviation	128 MHz	20 MHz	128 MHz	80 MHz
Maximum phase deviation (normal mode)	1280 rad	400 rad	64 rad	6000 rad
Narrow pulse width	20 ns	10 ns	20 ns	10 ns
Internal baseband generator RF BW	N/A	N/A	N/A	N/A
Waveform playback memory	N/A	N/A	N/A	N/A
Baseband generator mode	N/A	N/A	N/A	N/A
Phase coherent frequency switching	N/A	N/A	N/A	N/A
Signal or pulse descriptor word capability	N/A	N/A	N/A	N/A

⁴ Refer to individual product data sheets for details.

Benchtop Microwave Analog Signal Generators (Continued)

Benchtop Microwave Analog Signal Generators

Specifications ⁵	EXG MW			
Model Number	N5173B	AP5012A	AP5011A	AP5002A
Performance	**	**	**	*
Number of channels	1	1, 2, 3, 4	1	1
Frequency range (min. to max.)	9 kHz to 40 GHz	300 kHz to 40 GHz	100 kHz to 40 GHz	9 kHz to 26 GHz
Frequency switching speed	600 μ s	20 μ s	30 μ s	30 μ s
Sweep mode	Step, list	Step, list	Step, list	Step, list
Minimum output power at 1 GHz	-90 dBm	-80 dBm	-120 dBm	-120 dBm
Maximum output power at 1 GHz	+23 dBm	+24 dBm	+25 dBm	+23 dBm
Level accuracy at 1 GHz	\pm 0.6 dB	0.5 dB	\pm 0.8 dB	\pm 1.0 dB
SSB phase noise at 1 GHz	-122 dBc/Hz (20 kHz offset)	-130 dBc/Hz (1 kHz offset)	-142 dBc/Hz (20 kHz offset)	-130 dBc/Hz (20 kHz offset)
Harmonics at 1 GHz	-33 dBc	-30 dBc	-40 dBc (typ)	-30 dBc
Non-harmonics at 1 GHz	-72 dBc	-90 dBc (typ)	-60 dBc (typ)	-75 dBc (nom)
AM rate	DC to 100 kHz	0.1 Hz to 20 kHz	0.1 Hz to 30 kHz	0.1 Hz to 50 kHz
Maximum FM deviation	320 MHz	400 MHz	400 MHz	200 MHz
Maximum phase deviation (normal mode)	160 rad	600 rad	600 rad	300 rad
Narrow pulse width	20 ns	25 ns	15 ns	30.281 ns
Internal baseband generator RF BW	N/A	N/A	N/A	N/A
Waveform playback memory	N/A	N/A	N/A	N/A
Baseband generator mode	N/A	N/A	N/A	N/A
Phase coherent frequency switching	N/A	N/A	N/A	N/A
Signal or pulse descriptor word capability	N/A	N/A	N/A	N/A

⁵ Refer to individual product data sheets for details.

Benchtop RF Analog Signal Generators

Benchtop RF Analog Signal Generators

Specifications ⁶	PSG	MXG	EXG	
Model Number	E8663D	N5185A	N5171B	AP5001A
Performance	*****	*****	**	*
Number of channels	1	1, 2, 4	1	1
Frequency range (min. to max.)	100 kHz to 9 GHz	9 kHz to 8.5 GHz	9 kHz to 6 GHz	9 kHz to 6.1 GHz
Frequency switching speed	9 ms	800 μ s	800 μ s	200 μ s (nom)
Sweep mode	Step, list, ramp	Step, list	Step, list	
Minimum output power at 1 GHz	-90 dBm	-130 dBm	-110 dBm	-130 dBm (nom)
Maximum output power at 1 GHz	+21 dBm	+25 dBm	+21 dBm	+17 dBm
Level accuracy at 1 GHz	\pm 0.6 dB	\pm 0.8 dB	\pm 0.6 dB	\pm 0.8 dB
SSB phase noise at 1 GHz	-147 dBc/Hz (10 kHz offset)	-146 dBc/Hz (10 kHz offset)	-122 dBc/Hz (20 kHz offset)	-130 dBc/Hz (nom) (20 kHz offset)
Harmonics at 1 GHz	-55 dBc	-35 dBc	-35 dBc	-30 dBc
Non-harmonics at 1 GHz	-80 dBc	-80 dBc	-72 dBc	-65 dBc (nom)
AM rate	DC to 100 kHz	DC to 10 MHz	DC to 50 kHz	10 Hz to 50 kHz
Maximum FM deviation	16 MHz	500 MHz (nom)	40 MHz	200 MHz
Maximum phase deviation (normal mode)	160 rad	12 π (nom)	20 rad	80 rad
Narrow pulse width	20 ns	20 ns	20 ns	30.281 ns
Internal baseband generator RF BW	N/A	N/A	N/A	N/A
Waveform playback memory	N/A	N/A	N/A	N/A
Baseband generator mode	N/A	N/A	N/A	N/A
Phase coherent frequency switching	N/A	Optional	N/A	N/A
Signal or pulse descriptor word capability	N/A	N/A	N/A	N/A

⁶ Refer to individual product data sheets for details.

Agile Signal Generators

Agile Signal Generators

Specifications ⁷	UXG	UXG
Model Number	N5193A	N5194A
Performance	*****	*****
Number of channels	1	1
Frequency range (min. to max.)	10 MHz to 40 GHz	10 MHz to 40 GHz
Frequency switching speed	180 ns	170 ns
Sweep mode	Normal, list, fast CW, streaming	Streaming, chirp
Minimum output power at 1 GHz	-80 dBm	-90 dBm
Maximum output power at 1 GHz	+10 dBm	+6 dBm
Level accuracy at 1 GHz	±1.5 dB	±2.5 dB
SSB phase noise at 1 GHz	-144 dBc/Hz (10 kHz offset)	-144 dBc/Hz (10 kHz offset)
Harmonics at 1 GHz	-40 dBc	-60 dBc
Non-harmonics at 1 GHz	-70 dBc	-72 dBc
AM rate	DC to 10 MHz	N/A
Maximum FM deviation	600 MHz	N/A
Maximum phase deviation (normal mode)	12π	N/A
Narrow pulse width	10 ns	1 ns
Internal baseband generator RF BW	N/A	1.6 GHz
Waveform playback memory	N/A	6 GSa
Baseband generator mode	N/A	Waveform playback and real-time
Phase coherent frequency switching	Standard	Standard
Signal or pulse descriptor word capability	Standard	Standard

⁷ Refer to individual product data sheets for details.

Modular Signal Generators

	Vector Modular Signal Generators		Analog Modular Signal Generators	
Specifications ⁸	PXI MW	PXI RF	PXI MW	PXI CW Source
Model Number	M9383A	M9381A	M9383A	M9380A
Performance	****	***	****	**
Frequency range (min. to max.)	1 MHz to 44 GHz	1 MHz to 6 GHz	1 MHz to 44 GHz	1 MHz to 6 GHz
Frequency switching speed	250 μ s	10 μ s	250 μ s	5 ms
Sweep mode	Step	Step, list	Step	N/A
Minimum output power at 1 GHz	-90 dBm	-120 dBm	-90 dBm	-120 dBm
Maximum output power at 1 GHz	+19 dBm	+19 dBm	+19 dBm	+19 dBm
Level accuracy at 1 GHz	\pm 1.0 dB	\pm 0.4 dB	\pm 1.0 dB	\pm 0.4 dB
SSB phase noise at 1 GHz	-118 dBc/Hz (10 kHz offset)	-122 dBc/Hz (20 kHz offset)	-118 dBc/Hz (10 kHz offset)	-122 dBc/Hz (20 kHz offset)
Harmonics at 1 GHz	-46 dBc	-34 dBc	-46 dBc	-29 dBc
Non-harmonics at 1 GHz	-55 dBc	-66 dBc	-55 dBc	-66 dBc
AM rate	1 Hz to 640 MHz	6.25 MHz	DC to 70 kHz	N/A
Maximum FM deviation	320 MHz	1.25 MHz	40 MHz	N/A
Maximum PM phase deviation (normal mode)	10 rad	10 rads	8 rad	N/A
Narrow pulse width	20 ns	200 ns	20 ns	N/A
Internal baseband generator RF BW	1 GHz	160 MHz	N/A	N/A
Waveform playback memory	1024 MSa	1024 MSa	N/A	N/A
Baseband generator mode	Waveform playback	Waveform playback	N/A	N/A
Phase coherent frequency switching	N/A	N/A	N/A	N/A
Signal or pulse descriptor word capability	N/A	N/A	N/A	N/A

⁸ Refer to individual product data sheets for details.

Frequency Synthesizers

	FS1 Frequency Synthesizers			FS2 Frequency Synthesizers		
Model Number ⁹	AP4021A/ AP4022A	AP4011A/ AP4012A	AP4007A	AP4005A	AP4003A	AP4001A
Performance	*****	***	****	***	***	**
Frequency range (min. to max.)	8 kHz to 40 GHz	8 kHz to 20 GHz	8 kHz to 20 GHz	1 MHz to 40 GHz	100 kHz to 22 GHz	10 MHz to 20 GHz
Number of channels	1 (AP4021A) 1/2/3/4 (AP4022A)	1 (AP4011A) 1/2/3/4 (AP4012A)	1	1	1	1
Frequency switching speed	20 μ s	5 μ s	15 μ s	50 μ s	5 μ s	25 μ s
Sweep mode	Step, linear, list	Step, linear, list	Step, linear, list	Step, linear, list	Step, linear, list	Step, linear, list
Minimum output power at 1 GHz	-10 dBm	0 dBm	-20 dBm	-10 dBm	-20 dBm	+17 dBm
Maximum output power at 1 GHz	+20 dBm	+20 dBm	+15 dBm	+22 dBm	+23 dBm	+26 dBm
Level accuracy at 1 GHz	± 1.0 dB	± 1.0 dB	± 0.25 dB	± 1.0 dB	± 1.0 dB	N/A
SSB phase noise at 1 GHz	-146 dBc/Hz (100 kHz offset)	-126 dBc/Hz (20 kHz offset)	-138 dBc/Hz (20 kHz offset)	-143 dBc/Hz (20 kHz offset)	-131 dBc/Hz (20 kHz offset)	-128 dBc/Hz (100 kHz offset)
Harmonics at 1 GHz	-55 dBc	-5 dBc	-45 dBc	-30 dBc	-15 dBc	-15 dBc
Non-harmonics at 1 GHz	-75 dBc	-60 dBc	-70 dBc	-70 dBc	-75 dBc	-75 dBc
AM rate	N/A	N/A	N/A	N/A	N/A	N/A
Maximum FM deviation	N x 400 MHz	N/A	N/A	N/A	N x 500 MHz	N x 500 MHz
Maximum PM phase deviation (normal mode)	300 x N x rad	N/A	N/A	N/A	100 x N x rad	100 x N x rad
Narrow pulse width	30 ns	30 ns	30 ns	30 ns	30 ns	30 ns
Internal baseband generator RF BW	N/A	N/A	N/A	N/A	N/A	N/A
Waveform playback memory	N/A	N/A	N/A	N/A	N/A	N/A
Baseband generator mode	N/A	N/A	N/A	N/A	N/A	N/A
Phase coherent frequency switching	N/A	N/A	N/A	N/A	N/A	N/A
Signal or pulse descriptor word capability	N/A	N/A	N/A	N/A	N/A	N/A

⁹ Refer to individual product data sheets for details.

Simplify Signal Creation

Keysight's signal generation portfolio delivers a comprehensive suite of signal creation tools that enable engineers to simulate real-world scenarios with precision and flexibility. The signal generation family includes three powerful software to different workflows and deployment environments which can accelerate your work of test signal creation and reduce the time you spend on signal simulation. Its performance-optimized reference signals, validated by Keysight, enhance the characterization and verification of your devices. It also supports additive impairments, graphs, convenient connectivity and automation, and embedded and online documentation. You can control your vector signal generator directly from the software GUI and/or instrument front panel.

- Signal Studio, PC-based software
- PathWave Signal Generation (PWSG) Desktop, next-generation PC-based software
- PathWave Signal Generation (PWSG) Embedded, integrated with instrument firmware



Figure 1. Signal Studio (left), Signal Generation Desktop (middle) ,and Signal Generation Embedded (right)

Furthermore, you can configure signal generation to match your requirements and budget:

- Choose from flexible license types of node-locked, transportable, USB portable or floating
- Choose from perpetual or subscription based on your CAPEX or OPEX budget plan
- Select the license type that fits your specific use case and budget, including fixed, transportable, and 5- or 50-pack waveforms

Connect to a wide range of Keysight signal generator instruments

www.keysight.com/find/SignalStudio

www.keysight.com/find/signalstudio_software

www.keysight.com/find/signalstudio_platforms

Free Trial License

- Free 30-day trials of PathWave signal generation software are available to evaluate the user interface and generate signals. Redeem a trial license online at

http://www.keysight.com/find/SignalStudio_trial

Applications and Software Comparison

Benchtop

Applications and Signal Creation Software	UXG	VXG	XG4	MXG	EXG	CXG
	N5194A	M9484C	AP5042A AP5041A	N5186A	N5172B	N5166B
	Vector	Vector	Vector	Vector	Vector	Vector
Instrument Embedded Capabilities						
USB power meter					•	•
Step/list sweep	•	•	•	•	•	•
Ramp sweep	•					
Avionics		• ⁵	•	• ⁵	•	•
Multifunction generator		•		•	•	•
Pulse Train	•	•		•	•	•
AWGN and CW Interferer		•		•	•	•
Multitone and two-tone		• ⁶		• ⁶	•	•
Phase noise impairments					•	
BERT					•	
AM, FM, PM	•	• ⁷	•	• ⁷	•	•
Pulse Modulation		•	•	•	•	•
Signal Generation Embedded Applications (Licenses Inside Instrument as N76xxAPPC)						
3GPP MIMO Fading (5G NR, FR1, FR2 and LTE) (N7605APPC)		•				
Custom Fading (N7605APPC requires F9860400A Channel Studio TDL license)		•				
Custom Modulation (Custom IQ) (N/E7608APPC)		•		•		
Global Navigation Satellite Systems (GNSS) (N7609APPC)		•				
WLAN (802.11ac/ax/be/bn) (N/E7617APPC)		•		•		
Pulse Building (N7620APPC)		•				
5G NR/5G-Advanced (N/E7631APPC)		•		•		
LTE FDD (UL only; NB-IoT) (N7624APPC)		•				
LTE TDD (UL only) (N7625APPC)		•				
NR V2X (N7632APPC)						
Channel Response Correction & S-parameter De-embedding (N/E7653APPC)		•		•		
Envelope Tracking (N7655APPC)		•				
Arbitrary Waveform Utility (AWU) (N7618APPC)		•				
Virtual Instrument Simulation (N7688SIMC)		•		•		
Signal Generation Desktop Applications (Licenses Inside Instrument as N76xxEMBC)						
Advanced Waveform Utility (AWU) (N7618APPC)		•	•	•	•	•
5G NR/5G-Advanced		•		•	•	•

(N7631EMBC)						
NR V2X (N7632EMBC)		•		•	•	•
Signal Generation Waveform Playback with Signal Studio PC Software (licenses Inside Instrument as N76xxEMBC)						
Detection, General RF & Microwave						
Global Navigation Satellite Systems (GNSS) (N7609EMBC)		• ⁸	• ⁸	• ⁸	• ⁸	• ⁸
Pulse Building (N7620B/N7620EMBC)		• ⁹		• ⁹	•	
Multi-tone Distortion (N7621B)		• ⁶		• ⁶	•	•
Power Amplifier (N7614EMBC)					•	
Cellular Communications						
W-CDMA/HSPA+ (N7600EMBC)		•	•	•	•	•
CDMA2000/1xEV-DO (N7601EMBC)		•	•	•	•	•
GSM/EDGE/Evo (N7602EMBC)		•	•	•	•	•
TD-SCDMA/HSPA (N7612EMBC)		•	•	•	•	•
LTE/LTE-Advanced LTE-A Pro (NB-IoT/eMTC) (N7624EMBC)		•	•	•	•	•
LTE/LTE-Advanced TDD (N7625EMBC)		•	•	•	•	•
LTE V2X (N7626EMBC)		•	•	•	•	•
5G NR/5G-Advanced (N7631EMBC)		•	•	•	•	•
NR V2X (N7632EMBC)		•	•	•	•	•
Wireless Connectivity						
Bluetooth® (BR, EDR, LE4.x, 5.x, 6.0) (N7606EMBC)		•	•	•	•	•
DFS Radar Profiles (N7607EMBC)		•		•	•	•
IoT (Internet of Things) (802.15.4 SUN FSK or SUN OFDM, ZigBee, Z-Wave, LoRa, HRP UWB) (N7610EMBC)		•	•	•	•	• ¹⁰
Mobile WiMAX (N7615EMBC)		•	•	•	•	
WLAN 802.11a/b/g/j/p/n /ac/ah/ax/be/bn (N7617EMBC)		•	•	•	•	•

5. Avionics available as embedded application with N7641APPC for M9484C VXG-C and E7641APPC for N5186A MXG.
6. Multitone available as embedded application with N7621APPC for M9484C VXG-C and E7621APPC for N5186A MXG.
7. I/Q based AM, FM, PM available as embedded application with N7642APPC for VXG and E7642APPC for N5186A MXG.
8. Only support waveform files that simulate single or multi-satellite for GPS, GLONASS, Galileo, Beidou (Compass), SBAS, or QZSS for manufacturing test. M9484C VXG-C and N5172B MXG also supports the real-time creation of GNSS signals.
9. Pulse building supports N5186A MXG with N7620EMBC license. M9484C VXG supports the pulse building embedded application with N7620APPC.
10. HRP UWB is not supported with N5166B CXG.

Digital Video and Audio						
FM Stereo/RDS, DAB/DAB+/DMB (N7611EMBC)		•	•	•	•	•
Digital video standards (EVB-T/H/T2/C/S/S2/S2X, DTMB/CTTB, CMMB, ISDB-T/TB/TSB/TMM, ATSC-M/H, J.83 Annex A/B/C, DOCSIS) (N7623EMBC)		•	•	•	•	•
Land Mobile Radio (LMR) (N7640EMBC)		•	•	•	•	•
Threat Simulation						
Multi-emitter scenario generation (N7660EMBC)	•					
Simulation view	•					
Multi-source calibration (N7665EMBC)	•					
Other Software Tools						
SystemVue	•	•		•	•	•
MATLAB	•	•	•	•	•	•
Waveform pack license (22x for 5-pack license 25x for 50-pack license)		•	•	•	•	•

VXG Signal Generators

M9484C VXG Vector Signal Generator

Keysight has created the ultimate VXG signal generator to take your designs to the widest bandwidths, highest frequencies, and multichannel applications. With this fully integrated, calibrated, and synchronized solution, you don't need to worry about the errors caused by additional connections and instruments.



- Up to 4 synchronized and phase coherent channels in a single instrument
- Generate the most demanding test signals with up to 2.5 GHz of modulation bandwidth, or 10 GHz with channel bonding
- Streamline complex receiver test scenarios with up to 8-virtual-signal generators per RF channel, up to 32 signals in one instrument

www.keysight.com/find/m9484c

Key Specifications

M9484C VXG

Type	Benchtop
RF channels per box	1, 2, or 4 ¹⁰
Frequency range	9 kHz to 54 GHz
Frequency switching speed	3 ms
Output power at 10 GHz	+23 dBm
Level accuracy at 10 GHz	± 1.2 dB
SSB phase noise at 10 GHz, 10 kHz offset	-132 dBc/Hz
Harmonics at 10 GHz	-55 dBc
Internal baseband generator RF bandwidth	2.5 GHz (10 GHz ¹¹)
EVM (5G, 100 MHz, 28 GHz)	0.35% (meas.)
ACPR (5G, 100 MHz, 3.4 GHz)	-56 dBc (meas.)
Baseband generator memory	Up to 4 GSa

¹⁰ Four channels are available up to 20 GHz maximum frequency.

¹¹ With channel bonding.

PSG Signal Generators

The PSG is the industry's most trusted microwave signal generator, with thousands of units deployed in hundreds of programs around the world. With metrology-grade performance and evolving capabilities across RF and microwave frequencies, it continues to enable new designs that stay ahead of emerging threats.

E8257D PSG Microwave Analog Signal Generator



- Meet test system needs across a wide range: 13, 20, 31.8, 40, 50, and 67 GHz models available (add frequency extender modules to cover up to 1.1 THz)
- Test high-power devices and overcome test system losses with options capable of generating up to 1 W (+30 dBm) of output power
- Address the demanding needs of Doppler radar, ADC, and receiver-blocking tests with extremely low phase noise: -91 dBc/Hz at 100 Hz offset and -126 dBc/Hz at 10 kHz offset (10 GHz)
- Test your DUT with the highest quality signals — the PSG combines metrology-grade frequency and level accuracy with excellent distortion and spurious characteristics

www.keysight.com/find/E8257D

PSG RF Signal Generator E8663D Analog



The E8663D PSG RF analog signal generator provides excellent phase noise in a commercially available signal generator. With optional analog modulation (AM, FM, PM, and pulse) capability, superior level accuracy, and high output power, the E8663D is the right choice for demanding applications such as radar system development, satellite communications evaluation, or when a very low noise local oscillator or reference signal is needed. Built on the outstanding legacy of the 8663A, the E8663D delivers improved performance and is fully code compatible with its predecessor for seamless upgrades to existing test systems. Enhanced narrow pulse modulation and high output power are optionally available.

www.keysight.com/find/E8663D

Key Specifications	E8257D MW Analog	E8663D RF Analog
Frequency range	100 kHz to 70 GHz	100 kHz to 9 GHz
Frequency switching speed	9 ms	9 ms
Output power at 1 GHz	+26 dBm	+23 dBm
Level accuracy at 1 GHz	±0.6 dB	±0.6 dB
SSB phase noise (1 GHz; 10 kHz offset)	-143 dBc/Hz	-143 dBc/Hz
Harmonics at 1 GHz	-55 dBc	-55 dBc

Millimeter Wave Accessories for the PSG

Signal Generator Frequency Extension Modules from VDI, Inc.



The N5179V Series of signal generator frequency extension modules provide high power, synthesized frequency performance millimeter-wave test signals for waveguide bands from 50 GHz to 1.1 THz.

X-Series Signal Generators

Crafted to create signals capable of testing your very best devices and designs, the X-Series signal generators offer outstanding performance and low cost of ownership.

A proven, scalable platform combined with cost-effective calibration and internal diagnostics allows you to buy the capabilities you need today and easily upgrade to meet future requirements.

N5193A UXG Agile Signal Generator

The N5193A UXG agile signal generator creates realistic multi-emitter threat simulations for EW test. Off the shelf, the UXG is a powerful building block as a dependable LO or a scalable threat simulator that lowers the barriers between new intelligence and up-to-date signal scenarios.



- Using Direct Digital Synthesis (DDS), the UXG can update frequency, amplitude, and phase settings in as little as 180 ns, with built-in phase repeatability.
- The UXG directly accepts Pulse Descriptor Words (PDWs) to quickly and efficiently generate long pulse trains while allowing individual phase control.
- The UXG can simulate advanced radar signals, generating narrow pulses with 90 dB on/off ratio and chirps as wide as 10 to 25 percent of the carrier frequency.

www.keysight.com/find/N5193A

N5194A UXG Agile Vector Adapter

To take your lab to the next level, the N5194A UXG agile vector adapter works together with the N5193A to simulate increasingly complex signal environments with enhanced realism and greater confidence.



- Ideal for generating shaped pulses and wideband linear or non-linear chirps
- 2 GSa/s baseband generator provides 1.6 GHz instantaneous bandwidth
- Built-in solid-state attenuator provides 120 dB agile amplitude range

www.keysight.com/find/N5194A

Key Specification	N5193A UXG Agile Signal Generator	N5194A UXG Agile Vector Adapter
Frequency switching speed	180 ns	220 ns
Output power at 10 GHz	+10 dBm	+7 dBm
SSB phase noise at 10 GHz, 10 kHz offset	-126 dBc/Hz	-127 dBc/Hz
Harmonics at 10 GHz	-55 dBc	-61 dBc
Minimum pulse width	10 ns	1 ns
Baseband generator sample rate	N/A	2 GSa/s
Baseband generator memory	N/A	6 GSa

N5183B MXG Microwave Analog Signal Generator

The MXG is the pure and precise alternative to the analog PSG, with advantages in size and speed. It delivers the performance you need to perform module- and system-level testing—fast—in only two rack units.



- Meet test system needs up to 13, 20, 31.8, or 40 GHz
- Address demanding tests of radar modules and systems with excellent phase noise of < 124 dBc/Hz (10 kHz offset) with -75 dBc spurious (at 10 GHz)
- Save space and maintain test rigor with near-PSG performance levels in just two rack units
- Accelerate your calibration process with excellent switching speed of less than 600 μ s

www.keysight.com/find/N5183B

N5173B EXG Microwave Analog Signal Generator

The EXG is the cost-effective choice when you need to balance budget and performance. In just two rack units, it provides the essential signals that address parametric testing of broadband filters, amplifiers, receivers, and more.



- Perform basic LO upconversion or CW blocking with low-cost coverage to 13, 20, 31.8, or 40 GHz
- Characterize broadband microwave components such as filters and amplifiers with the best combination of output power (+20 dBm at 20 GHz), low harmonics (< 55 dBc), and full step attenuation)
- Use as a high-stability system reference with standard high- performance OCXO at an aging rate of less than $\pm 5 \times 10^{-10}$ parts per day
- Shrink your test stand with optional integrated multifunction generator and USB power sensor interface

www.keysight.com/find/N5173B

Key Specifications	N5183B MXG Microwave Analog	N5173B EXG Microwave Analog
Frequency range	9 kHz to 40 GHz	9 kHz to 40 GHz
Frequency switching speed	600 μ s	600 μ s
Output power at 10 GHz	+20 dBm	+20 dBm
Level accuracy at 10 GHz	± 0.7 dB	± 0.7 dB
SSB phase noise at 10 GHz	-129 dBc/Hz (10 kHz offset)	-101 dBc/Hz (20 kHz offset)
Harmonics at 10 GHz	-55 dBc	-55 dBc

N5186A Vector and N5185A Analog MXG Signal Generators

Compact, integrated performance. With reduced external connections and up to four channels in a 2U box, Keysight's N5186A and N5185A MXG signal generators simplifies your complex test setups while still delivering powerful, precise signals. The MXG is optimized to be your ideal signal generator with the outstanding performance you desire, all in one easy-to-use box.



- Generate precise, low-distortion signals with a custom Digital-to-Analog Converter (DAC) ASIC that uses direct digital synthesis.
- Maximize performance with the embedded reflectometer to correct the match of your Device Under Test (DUT) to improve the response of the output signal's power and channel flatness.
- Generate wireless communication standards-based signals, extend your reference plane, and correct the power incident to the DUT using Keysight PathWave signal generation software.

www.keysight.com/find/N5186A

N5182B Vector and N5181B Analog MXG RF Signal Generators

To help you reach better performance, the MXG X-Series vector and analog signal generators are fine-tuned to be your “golden transmitter” in R&D. Whether you’re pushing for a linear RF chain or an optimized link budget, the MXG delivers what you need: phase noise, ACPR, channel coding, and much more. Reveal the true performance of your devices and test your designs within and beyond their limits with the MXG.



- Test radar receiver sensitivity or characterize ADC with excellent phase noise
- Characterize nonlinear PA behavior with excellent ACPR and output power
- Go beyond standard application requirements with sophisticated real-time and waveform-based PathWave signal generation software

www.keysight.com/find/N5182B

www.keysight.com/find/N5181B

Key Specifications	N5186A MXG Vector	N5185A MXG Analog	N5182B MXG RF Vector	N5181B MXG RF Analog
Frequency range	9 kHz to 8.5 GHz	9 kHz to 8.5 GHz	9 kHz to 6 GHz ¹³	9 kHz to 6 GHz
Frequency switching speed	800 μs	800 μs	800 μs	800 μs
Output power at 1 GHz	+26 dBm	+26 dBm	+26 dBm	+26 dBm
Level accuracy at 1 GHz	±1.1 dB (typ)	±1.1 dB (typ)	±0.6 dB	±0.6 dB
SSB phase noise at 1 GHz, 10 kHz offset	-146 dBc/Hz	-146 dBc/Hz	-146 dBc/Hz	-146 dBc/Hz
Harmonics at 1 GHz	-35 dBc	-35 dBc	-35 dBc	-35 dBc
Internal baseband generator RF bandwidth	1 GHz	N/A	160 MHz	N/A
EVM (LTE)	0.2% (typ)	N/A	0.2% (meas)	N/A
ACPR (LTE)	-71 dBc	N/A	-71 dBc	N/A
Baseband generator memory	Up to 2048 MSa	N/A	Up to 1024 MSa	N/A

13. Frequency extension up to 7.2 GHz for N5182B with frequency extender N5182BX07

N5172B Vector and N5171B Analog EXG RF Signal Generators

To help you achieve faster throughput and greater uptime, the cost-effective EXG X-Series signal generators are optimized for manufacturing test. With analog and vector models, the EXG provides the signals you'll need for basic parameter testing of components and functional verification of receivers. Get “just enough” test at the right price with the EXG.



- Maximize test margins on the production line with great ACPR
- Maximize throughput with < 800 μ s simultaneous switching of frequency, power and waveform type
- Enable rapid, accurate tests using Signal Studio's predefined, standards-based waveforms
- Shrink your test stand with two rack-unit height and integrated multi-function generator and USB power sensor interface

www.keysight.com/find/N5172B

www.keysight.com/find/N5171B

CXG RF Vector Signal Generator N5166B

The N5166B CXG X-Series RF Vector Signal Generator, that is a low-cost, multi-functional signal generation tool, used in general-purpose and educational applications. CXG provides excellent RF performance, and scalable capabilities in a low-cost of ownership for engineers, designing general purpose devices, consumer electronics devices, or for educators in teaching labs.



- Frequency range of 9 kHz – 3 or 6 GHz and up to 120 MHz RF modulation bandwidth
- Perform basic parametric testing of components and functional verification of receivers
- Test your device with multiple verified, standards-compliant vector signals
- Easily troubleshoot your component within a wireless communication system using a reliable vector signal generator
- Minimize downtime and expenses with self-maintenance solutions and low-cost repairs

www.keysight.com/find/n5166b

Key Specifications	N5172B EXG RF Vector	N5171B EXG RF Analog	N5166B CXG RF
Frequency range	9 kHz to 6 GHz ¹⁴	9 kHz to 6 GHz	9 kHz to 6 GHz
Frequency switching speed	800 μ s	800 μ s	5 ms
Output power at 1 GHz	+26 dBm	+26 dBm	+18 dBm
Level accuracy at 1 GHz	\pm 0.6 dB	\pm 0.6 dB	\pm 0.6 dB
SSB phase noise at 1 GHz, 20 kHz offset	-122 dBc/Hz	-122 dBc/Hz	-119 dBc/Hz
Harmonics at 1 GHz	-35 dBc	-35 dBc	< -35 dBc
Internal baseband generator RF bandwidth	160 MHz	N/A	120 MHz
EVM (LTE)	0.2%	N/A	0.2%
ACPR (3GPP W-CDMA TM1 64 DPCH)	-73 dBc	N/A	-70 dBc
Baseband generator memory	Up to 512 MSa	N/A	Up to 512 MSa

14. Frequency extension up to 7.2 GHz for N5172B with frequency extender N5182BX07

Frequency Extender for EXG or MXG

N5182BX07 Frequency Extender for EXG or MXG

The N5182BX07 Frequency Extender extends any N5182B MXG or N5172B EXG with Option 506 to cover the 802.11ax bands and 5G unlicensed bands up to 7.2 GHz with exceptional Error Vector Magnitude (EVM). Take your devices and designs to the limit with the N5182BX07 Frequency Extender.

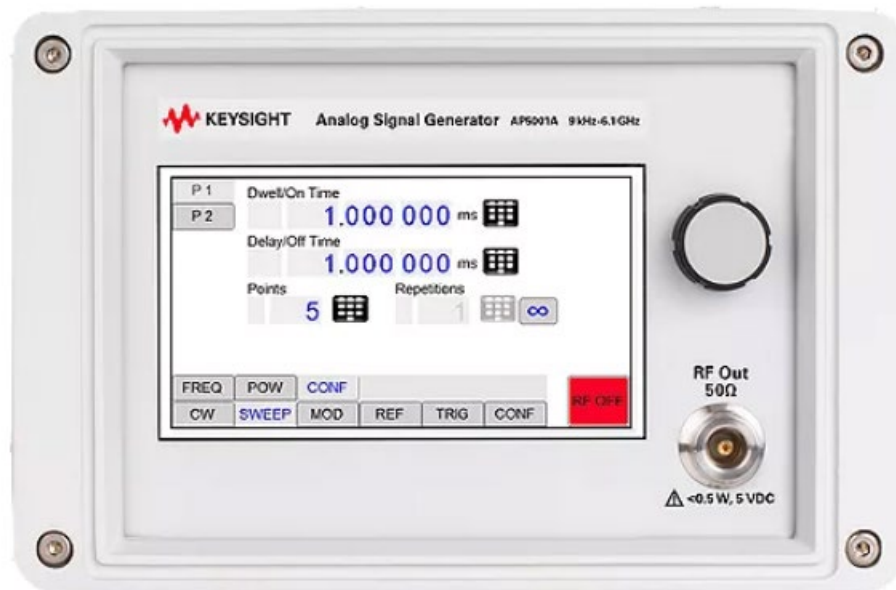


- Provide a single RF output for full frequency coverage from 9 kHz to 7.2 GHz and 160 MHz modulation bandwidth.
- Control from an MXG/EXG front panel as usual and automate the test systems using the same SCPI commands via LAN, GPIB, or USB.
- Generate an 802.11ax 160 MHz bandwidth signal at 7.2 GHz and achieve excellent EVM performance < -47 dB (0.45%) for output power up to +5 dBm.

www.keysight.com/find/n5182bx07

Compact Signal Generators

RF Analog Signal Generator



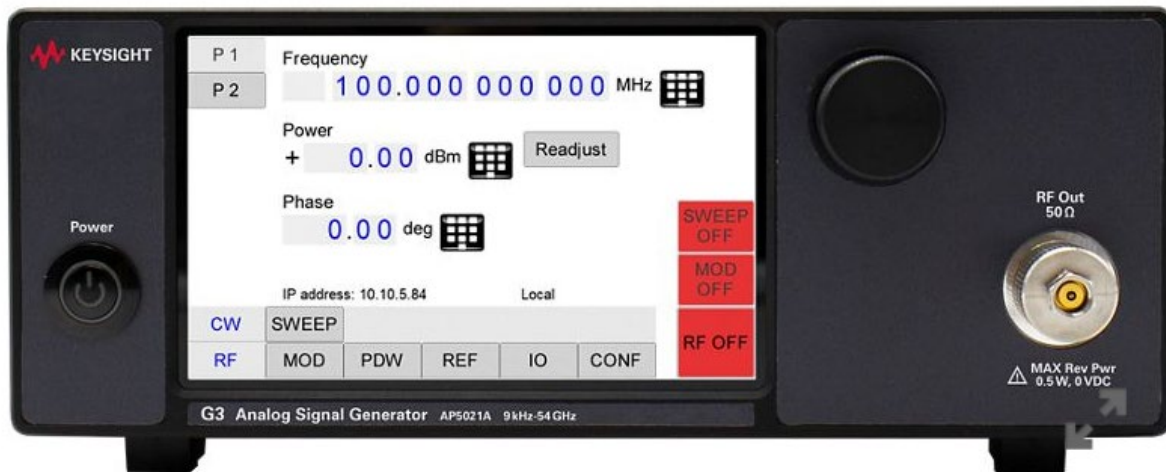
The Keysight AP5001/2A G2 analog signal generator covers RF and microwave frequency ranges from 9 kHz to 6.1 /26 GHz with excellent signal purity and fast switching speed.

Experience the convenience of a compact, powerful testing tool with the Keysight AP5002A analog signal generator as your go-to Radio Frequency (RF) and microwave signal source.

- Use for various RF and microwave applications with accurately leveled output power from -120 dBm to +23 dBm.
- Measure accurately with OCXO stabilized signal (phase noise -130 dBc/Hz at 1 GHz, 20 kHz offset) with mHz resolution.
- Boost throughput and accelerate testing with fast switching speed.
- Leverage a range of extensive modulation capabilities such as AM, FM, PM, pulse modulation, pulse train, and frequency chirps.
- Seamlessly operate with an optimized user interface — including an LCD touch screen and remote desktop software.
- Upgrade licenses at any time for higher frequencies and additional options.

www.keysight.com/find/AP5001A

Microwave Analog Signal Generator



The Keysight AP5011/21A analog signal generator combines ultra-low phase noise with ultra-fast switching speed to set new standards for RF and microwave testing.

The Keysight AP5021A G3 analog signal generator is a high-purity, ultra-low phase noise signal generator covering frequencies from 9 kHz to 12.75, 20, 40, or 54 GHz.

The Keysight AP5021A G3 analog signal generator provides excellent harmonic and spurious performance in a convenient, lightweight model. A combination of low phase noise, significantly high spectral purity, and fast switching speed allow your testing teams to generate high-quality signals for production, Analog-to-Digital Conversion (ADC), and radar receiver testing. Housed in a convenient desktop enclosure, the G3 analog signal generator also provides touchscreen and remote control configuration options, along with Graphic User Interface (GUI) software or standard SCPI commands for seamless programming.

- Cover frequency ranges from 9 kHz to 12.75, 20, 40, or 54 GHz
- Get pure signal quality with low SSB phase noise (-126 dBc/Hz typ. at 10 GHz 10 kHz offset)
- Retain value with aging factor of < 20 ppb year
- Generate high-quality harmonics at -50 dBc, spurious X-Band -80 dBc typ.
- Perform extensive tests with advanced pulse modulation ON/OFF 100 dB typ. (rise time 5 ns typ., pulse width 20 ns)
- Boost throughput and accelerate testing with a fast switching speed of 15 μ s (typ.)
- Choose from frequency range options including up to 12.75 GHz, 20 GHz, 40 GHz, or 54 GHz



The Keysight AP5012A G2 analog signal generator offers multiple signal sources with phase-coherent switching and independent channel programming in a single 1U high enclosure.

The AP5022A G3 analog signal generator is a low phase noise signal generator with fast switching and up to four independently programmable, phase-coherent outputs.

The Keysight AP5022A G3 analog signal generator is a multi-channel signal generator offering 9 kHz to 54 GHz with ultra-low phase noise. For high phase coherence, RF channels are locked to a single reference source. The combination of excellent harmonic and spurious performance with fast switching makes this model ideal for situations where high performance is paramount.

- Choose from 1-, 2-, 3-, or 4-channel configurations in a 2HU 19-inch enclosure
- Supports SCPI commands of other common analog signal generators
- Independently program up to four phase-coherent outputs
- Excellent SSB phase noise of -130 dBc/Hz typ. at 10 GHz, 20 kHz offset
- Maintain frequency accuracy with < 20 ppb year average aging factor
- Achieve a fast switching speed of 5 μ s (typ.)

www.keysight.com/find/AP5011A

www.keysight.com/find/AP5021A

www.keysight.com/find/AP5012A

www.keysight.com/find/AP5022A

Milimeterwave Analog Signal Generator



The Keysight AP5031A analog signal generator combines ultra-low phase noise with ultra-fast switching speed to set new standards for RF and microwave testing.

Set new standards for your RF and microwave testing with the extremely low phase noise and ultra-fast switching offered by the AP5031A analog signal generator. With models ranging in frequency from 1 kHz to 12.75, 20, 40, and 51 GHz, the AP5031A combines an intuitive GUI, excellent signal purity and agility with accurate and broad power ranges to enable you to test with confidence.

- Agile signals with switching speed as fast as 3 μ s (typ)
- Get pure signal quality with low SSB phase noise (-135 dBc/Hz typ. at 10 GHz 10 kHz offset)
- Achieve excellent frequency accuracy with high-stability OCXO reference
- Utilize a wide range of external references, including the commonly used 10 and 100 MHz, for higher phase synchronization
- Test with AM, FM, PM and pulse modulation
- Enable excellent phase synchronization among the outputs of multiple instruments via high-frequency CLK ports
- Leverage USB, LAN, or GPIB communication interface options
- implement control seamlessly with a customer-supplied application programming interface

www.keysight.com/find/AP5031A

PXI Signal Generators

PXIe Vector Signal Generator M9381A

Optimized for RF device design validation and manufacturing test environments, the M9381A PXI VSG delivers a combination of speed, performance, and multichannel capability. Built on a flexible, scalable modular platform, the M9381A PXI VSG is the low-risk way to manage change and be ready for tomorrow — today.



- Fast amplitude and frequency switching to reduce test time
- Scalable platform fits up to 4 channels in one chassis, and 8 channels in multi-chassis configuration
- Channels time synchronized to within 1 ns and phase coherent to within 1 degree
- Up to 160 MHz RF bandwidth
- Easily integrate into test environments with IVI-COM, IVI-C, LabVIEW, and MATLAB drivers

www.keysight.com/find/M9381A

PXIe CW Source M9380A

With high output power and accurate amplitude control, the M9380A PXIe CW source is a compact, cost-effective analog source, ideal for LO substitution, interference injection, and wireless component test. With fast PXI architecture and multiple drivers and programmatic interfaces, the M9380A is designed for high-speed automated test.



Keysight Quality and Support in PXI

Keep measurement quality while reducing your cost of ownership with Keysight's unique RF modular calibration and fast core exchange strategy. Keysight PXI signal generators are factory calibrated, shipped with ISO-9002, NIST traceable Cal certificate, and include a 1-year warranty.

<http://www.keysight.com/find/pxi-vsg>

www.keysight.com/find/M9380A

Key Specifications	M9381A PXIe Vector	M9380A PXIe CW
Frequency range	1 MHz to 6 GHz	1 MHz to 6 GHz
Frequency switching speed	10 μ s	5 ms
Output power at 1 GHz	+19 dBm	+19 dBm
Level accuracy at 1 GHz	\pm 0.4 dB	\pm 0.4 dB
SSB phase noise at 1 GHz, 20 kHz offset)	-122 dBc/Hz	-122 dBc/Hz
Harmonics at 1 GHz	-34 dBc	-29 dBc
Internal baseband generator RF bandwidth	160 MHz	N/A
EVM (LTE)	0.32%	N/A
ACPR (3GPP W-CDMA TM1 64 DPCH)	-70 dBc	N/A
Baseband generator memory	Up to 1024 MSa	N/A

PXIe MW Signal Generator M9383A

The M9383A PXIe microwave signal generator is a compact modular instrument that provides frequency coverage from 1 MHz to 44 GHz, up to 1 GHz RF modulation bandwidth with an internal baseband generator, and over 2 GHz RF modulation bandwidth with external I/Q inputs. Based on the PXIe industry standard, the M9383A is highly configurable and expandable. The smallest configuration, a 14 GHz analog signal generator, can be used in simple LO or blocking applications, and the largest configuration, a 44 GHz vector signal generator, can be used for 5G applications. Many other configurations are possible, allowing the M9383A PXIe microwave signal generator to be customized for specific application requirements.



- Modular test solution for design validation that can be efficiently leveraged into manufacturing
- Flexibility to solve your immediate test needs, but upgradable for what comes next - whether that's upgrading for frequency coverage, or a rapid shift to high volume production.
- Easily configurable to support a variety of uses, from LO and blocking applications to 5G test

www.keysight.com/find/m9383a

Key Specifications	M9383A PXI MW
Frequency range	1 MHz to 44 GHz
Frequency switching speed	250 us
Output power at 10 GHz	+22 dBm
Level accuracy at 10 GHz	±1.3 dB
SSB phase noise at 10 GHz, 10 kHz offset	-118 dBc/Hz
Harmonics at 10 GHz	-55 dBc
Internal baseband generator RF BW	1 GHz
Baseband generator memory	Up to 1024 MSa

Frequency Synthesizers

FS1-class Frequency Synthesizer

The Keysight FS1-class Frequency Synthesizers include the AP4011A, AP4012A, AP4021A, and AP4022A Frequency Synthesizers, with single-channel and multi-channel options and a variety of form factors available. Select the one you need based on frequency range, number of phase-coherent channels, phase noise, and switching speed.

FS2-class Frequency Synthesizer

The Keysight FS2-class Frequency Synthesizers include the AP4001A, AP4003A, AP4005A, and AP4007A Frequency Synthesizers. They provide fast switching speeds, low phase noise, and high signal quality for a wide range of signals with precise frequency control. Their compact size allows you to easily integrate them into your test system for various applications, including wireless communications, radar, electronic warfare, and quantum computing.











- Deliver precise, stable signals quickly with ultra-fast switching and low-phase noise, ensuring high signal integrity in applications like wireless communication systems and high-frequency radar.
- Ensure exceptional frequency accuracy and stability with the internal oven-controlled crystal oscillator (OXCO), ideal for high-precision applications.
- Support for various form factors, including compact and rack-mountable for space-constrained embedded systems.
- Choose the right number of channels for your application, from cost-effective single-channel models to multi-channel units ideal for MIMO applications or testing multiple frequency bands at once.

www.keysight.com/zz/en/products/signal-sources/frequency-synthesizers

Migrating from Legacy Signal Generators

Carefully planned instrument migration and modernization can maximize your test- system efficiency, performance, and readiness, while minimizing risk and potential disruptions, keeping you at the leading edge in the competitive marketplace. The Keysight VXG, PSG and X-Series signal generators are designed as evolutionary replacements to their in-class predecessors. Take advantage of their performance, flexibility, speed, and modern connectivity in replacing legacy Keysight signal generators.


 VXG MW vector M9484C	 PSG MW analog E8257D	 MXG/EXG MW analog N5183B/N5173B	 PSG RF analog E8663D	 MXG RF vector N5186A	 MXG RF analog N5185A	 EXG RF vector N5172B	 EXG RF analog N5171B
E8267D	8340A/B 8341A/B	N5183A	8662A/B 8643A 8644B 8645A 8664A 8665A/B	N5182B	N5181B	N5182A	N5181A
8780A E2500B	83620A/B 83622A/B 83623B/L 83624A/B 83630B/L 83640B/L 83650B/L	8672A 8763A/B/C/D 8340A/B 8341A/B		ESG-DP Series E4434B E4435B E4436B E4437B	ESG-AP Series E4423B E4424B E4425B E4426B	ESG-D Series E4430B E4431B E4432B E4433B	ESG-A Series E4400B E4420B E4421B E4422B
	83711A/B 83712A/B 83731A/B 83732A/B 83751A/B 83752A/B	83620A/B 83622A/B 83623B/L 83624A/B 83630B/L 83640B/L			8672A 8763A/B/C/D		8647A 8648A/B/C/D
		83711A/B 83712A/B 83731A/B 83732A/B 83751A/B 83752A/B			8662A/B 8643A 8644B 8645A 8664A 8665A/B		8656B 8657A/B/D/J

Confidently Covered by Keysight Services

Prevent delays caused by technical questions, or system downtime due to instrument maintenance and repairs with Keysight Services. Keysight Services are here to support your test needs with expert technical support, instrument repair and calibration, software support, training, alternative acquisition program options, and more.

A KeysightCare agreement provides dedicated, proactive support through a single point of contact for instruments, software, and solutions. KeysightCare covers an extensive group of instruments, application software, and solutions and ensures optimal uptime, faster response, faster access to experts, and faster resolution.

Keysight Services

Offering	Benefits
KeysightCare 	KeysightCare provides elevated support for Keysight instruments and software, with access to technical support experts that respond within a specified time and ensure committed repair and calibration turnaround times (TAT). KeysightCare offers multiple service agreement tiers, including KeysightCare Assured, Enhanced, and Application Software Support. See the KeysightCare data sheet for details.
KeysightCare Assured	KeysightCare Assured goes beyond basic warranty with repair services that include committed TAT and unlimited access to technical experts.
KeysightCare Enhanced	KeysightCare Enhanced includes all the benefits of KeysightCare Assured plus Keysight's accurate and reliable calibration services, accelerated, and committed TAT, and technical response.
Keysight Support Portal & Knowledge Center	All KeysightCare tiers include access to the Keysight Support Portal where you can manage support and service resources related to your assets such as service requests, and status, or browse the Knowledge Center.
Education Services	Build confidence and gain new skills to make accurate measurements, with flexible Education Services developed by Keysight experts. Including Start-up Assistance.

Recommended Services

Maximize your test system up-time by securing technical support, repair, and calibration services with committed response and turnaround times. 1-year KeysightCare Assured is included in every new instrument purchase. Obtain multi-year KeysightCare upfront to eliminate the need for lengthy and tedious paperwork and yearly requests for maintenance budget. Plus, you benefit from secured service for 2, 3, or 5 years.

Service	Function
KeysightCare Enhanced*	Includes Tech Support, Warranty and Calibration
R-55B-001-1	KeysightCare Enhanced – Upgrade 1 year
R-55B-001-2	KeysightCare Enhanced – Extend to 2 years
R-55B-001-3	KeysightCare Enhanced – Extend to 3 years (recommended)
R-55B-001-5	KeysightCare Enhanced – Extend to 5 years (recommended)
KeysightCare Assured	Includes Tech Support and Warranty
R-55A-001-2	KeysightCare Assured – Extend to 2 years
R-55A-001-3	KeysightCare Assured – Extend to 3 years
R-55A-001-5	KeysightCare Assured – Extend to 5 years
Start-Up Assistance	
PS-S10	Included – instrument fundamentals and operations starter
PS-S20	Optional, technology & measurement science standard learning

* Available in select countries. For details, please view the datasheet. R-55B-001-2/3/5 must be ordered with R-55B-001-1.

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.



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