TECHNICAL OVERVIEW

VXG Series

Microwave Signal Generators

- 9 kHz to 54 GHz (110 GHz with the V3080A frequency extender)
- Up to 2.5 GHz modulation bandwidth per channel (5 GHz with channel bonding)
- Up to 4 channels in one box
- Industry-leading performance
- Sophisticated real-time applications

KEYSIGHT TECHNOLOGIES

Discover VXG Signal Generation

Keysight's VXG provides a dual-channel vector signal generator with up to 110 GHz frequency range and 2.5 GHz of modulation bandwidth per channel to enable your next breakthrough.

Do more with less

The scalable architecture of the VXG signal generator enables higher frequency coverage, wider bandwidths, and multichannel applications with ease and accuracy. It allows you to reduce test complexity and achieve faster, repeatable results.

- Cover frequency ranges from 9 kHz to 110 GHz
- Generate the most demanding signals with the extremely wide modulation bandwidth
- Enable multi-antenna test applications such as MIMO and beamforming with precise phase coherence and timing synchronization

Measure with confidence

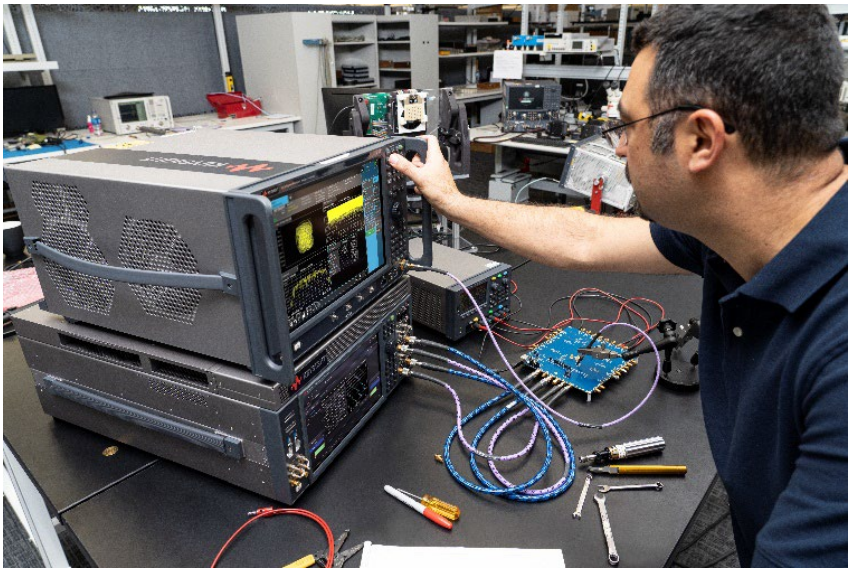
Keysight's fully integrated, calibrated, and synchronized signal generation solution helps you minimize measurement uncertainty. You no longer need to worry about errors introduced by complex test setups that require countless connections across multiple instruments.

- Overcome excessive path loss at higher frequencies without sacrificing performance
- Deliver the best RF performance for accurately characterizing your device
- Enable precise multi-channel and multi-instrument synchronization

Summary of key specifications

Specification	M9484C	M9384B	M9383B
Type	Benchtop	Benchtop	Modular
RF channels per box	1, 2, or 4[1]	1 or 2	1 or 2
Frequency range	9 kHz to 54 GHz (110 GHz[2])	1 MHz to 44 GHz	1 MHz to 44 GHz
Modulation bandwidth	2.5 GHz (5 GHz[3])	2 GHz (4 GHz[3])	2 GHz
Output power at 10 GHz	+23 dBm	+22 dBm	+22 dBm
Phase noise at 10 GHz, 10 kHz offset	-132 dBc/Hz	-126 dBc/Hz	-126 dBc/Hz
EVM (5G, 100 MHz, 28 GHz)	0.35% (meas.)	0.96% (nom.)	0.96% (nom.)
ACPR (5G, 100 MHz, 3.4 GHz)	-56 dBc (meas.)	-53 dBc (nom.)	-53 dBc (nom.)
Baseband generator memory	Up to 4 GSa	Up to 2 GSa	Up to 2 GSa

[1] Four channels are available up to 20 GHz maximum frequency.
[2] With the V3080A vector signal generator frequency extender.
[3] With channel bonding.



Generate True Performance

To know your device's behavior, you'll take many paths. Keysight's VXGs produce the signals you need—from simple to complex, from clean to dirty—to test your design within and beyond its limits.

Industry-leading phase noise with DDS

The VXGs adopt a modern direct digital synthesis (DDS) design. The DDS architecture provides substantial phase noise improvements at wide offsets with extremely fine frequency tuning resolution. The VXG supports up to four coherent channels in one instrument and a controllable phase relationship between the channels.

Best dynamic range with direct RF architecture

With an advanced high-speed digital-to-analog converter (DAC) and digital signal processor, M9484C VXG's DDS can generate signals up to 8.5 GHz direct from the 14-bit DAC without images. The direct DDS architecture eliminates signal impairments caused by the analog I/Q modulator, such as gain imbalance, timing skew, quadrature skew, DC offset, and phase noise. This new solution delivers the best dynamic range, especially for wideband signal generation.

Emulate Complex Test Scenarios

Designing receivers is challenging because wireless devices are required to handle a wide variety of input signal conditions. You need to emulate wireless channels and inject noise and interferers to characterize the receiver's performance.

Emulate multiple transmitters

The M9484C VXG can emulate up to 8 transmitters simultaneously per RF channel without images for receiver rejection and immunity tests; that is, up to 32 transmitters in one box. You can set the frequency and output level in real time for each signal, and you do not need to worry about the calibration of external accessories.

Advanced real-time applications

Perform advanced receiver testing compatible with the latest standards using M9484C VXG and PathWave Signal Generation software: define signal parameters, transfer them to the instrument, and use closed loop or interactive control during signal generation.

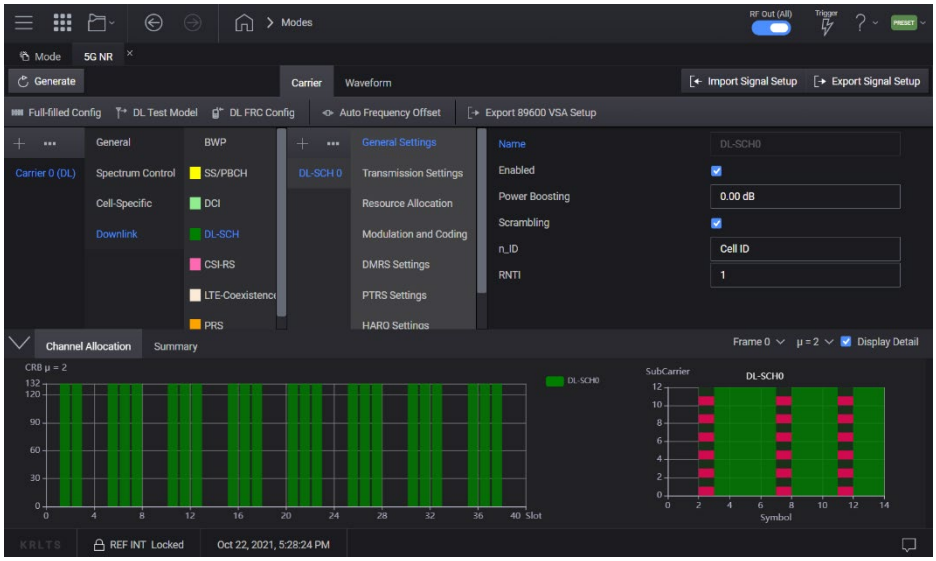
Meet receiver performance test requirements

The M9484C VXG can simulate MIMO channels with multipath and fading models for 5G NR performance test requirements with a built-in DSP engine.

Accelerate Design and Test Workflows

Accelerate your work with PathWave Signal Generation software and VXG's streamlined graphical user interface (GUI) that reduces the time you spend on signal simulation.

Streamlined GUI

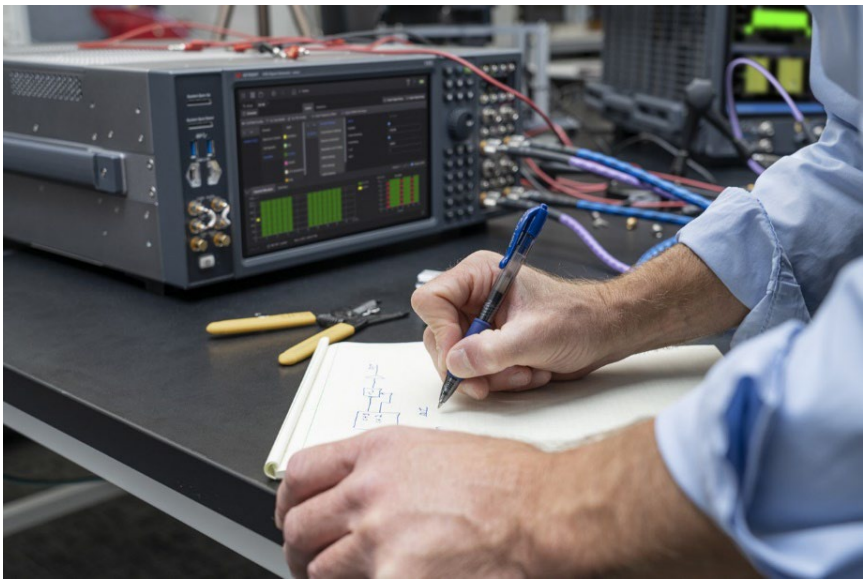


The GUI and embedded applications allow engineers to generate complex modulation signals easily and provides quick troubleshooting and characterization. It delivers a streamlined experience when creating standard-compliant test signals. Also, VXGs provide advanced tools to help you reduce measurement uncertainty and time.

- **Automatic channel response correction and S-parameter de-embedding** to remove external network's frequency responses
- **Instrument nonlinear correction** to minimize distortion at high power levels
- **Smart linkage** with X-Series Signal Analyzers to reduce time spend on measurement setup

PathWave Signal Generation

PathWave Signal Generation software simplifies the characterization and verification of your wireless devices with performance-optimized signals or quickly creates custom reference signals. It accelerates test workflow with pre-defined compliance test setups and ensures your designs meet the latest standards.



Cellular Communications

Tomorrow’s cellular breakthroughs require maximum throughput, robust links, and data handling capabilities. Whether you need to perform 5G base station transmitter, receiver conformance tests, or RFIC characterization, the VXG signal generators provide the widest bandwidth, highest frequency coverage, and multi-antenna support.

Reduce the time you spend on signal simulation and system calibration. You can accelerate your design and test workflow with pre-configured 5G complex MIMO fading conformance test software. Through Keysight’s involvement and leadership role in industry standards, you can rely on our PathWave Signal Generation software to create signals that conform to the latest 3GPP 5G NR standard.

White paper:

- 4 Tips for 5G New Radio (5G NR) Signal Creation

Satellite Communications

Exponential growth in demand for high throughput satellite (HTS) systems has triggered the need for modern technologies capable of wide signal bandwidth at higher frequencies and higher-order modulation schemes to improve spectral efficiency. You need to thoroughly test your satellite systems and RF components to ensure they operate with the highest quality of service over the lifecycle of the satellite.

Keysight's VXG signal generators provide you with the industry's widest modulation bandwidth and frequency coverage to enable the most advanced satellite system designs. The VXG helps you test the true performance of your receiver and component designs with the excellent EVM and phase noise.

White Papers:

- Modulation Techniques for Satellite Communications
- How to Characterize Wideband High-Power Amplifiers

Related Literature

Type	Title
Catalog	Signal Generation Solutions Catalog
Catalog	RF Product Catalog
Technical overview	Selecting a Signal Generator
Configuration guide	M9484C VXG Microwave Signal Generator Configuration Guide
Configuration guide	M9384B VXG Microwave Signal Generator Configuration Guide
Configuration guide	M9383B VXG-m Microwave Signal Generator Configuration Guide
Data sheet	M9484C VXG Data Sheet
Data sheet	M9384B VXG and M9383B VXG-m Signal Generator Data Sheet
Brochure	PathWave Signal Generation Brochure
White paper	Improve Test Integrity for RF and Microwave Signal Generation
White paper	4 Tips for 5G New Radio (5G NR) Signal Creation
White paper	Modulation Techniques for Satellite Communications
White paper	Configuring Phase-Coherent RF Signal Generation
White paper	How to Characterize Wideband High-Power Amplifiers
White paper	Understanding and Testing Multi-Channel RF Systems with Signal Generators Part 1
White paper	Understanding and Testing Multi-Channel RF Systems with Signal Generators Part 2

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