Agilent MXG Signal Generators

Performance optimized for manufacturing

- Fast switching speeds
- Industry-best ACPR
- Simplified self-maintenance
- Signal Studio software

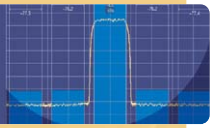
Agilent Technologies

Agilent MXG Signal Generators –
Making an Impact in Manufacturing

Fastest switching

≤ 1.2 ms in SCPI mode for increased throughput

Superior ACPR



–76 dBc adjacent channel power levels[1] for testing high dynamic range components

Flexible signal creation tools

Proven Signal Studio software with a first-to-market track record

Simplified self-maintenance

Innovative design for easy maintenance and reduced downtime

Demands on the production line for communications systems, receivers and components continue to intensify. Agilent MXG signal generators have been optimized specifically to meet the challenges facing manufacturers — throughput, yield, and downtime.

Increasing throughput

With fast switching speeds, Agilent MXG signal generators reduce test time, letting you make more measurements using fewer resources and capital.

Raising test yield

For out-of-channel measurements such as ACPR, the Agilent MXG vector signal generator offers the industry's best dynamic range, reducing error contribution from the stimulus and ultimately improving test margins and yield.

Reducing downtime

Agilent MXG signal generators are made to maximize up-time through reliability and simplified self-maintenance. Starting from a simple design for dependable performance to cost- and time-effective tools for easy onsite maintenance, Agilent MXG is an ideal solution for manufacturers working in today's highly cost sensitive communications industry.

1. Measured performance for a 1-carrier 3GPP W-CDMA signal (Test Model 1, 64 DPCH)

A Solution
Scalable to Your Needs

A purchase consideration: *reliability and cost of ownership*

Reliability is often one of the key considerations manufacturing test managers use to make equipment purchases because of the direct connection to downtime. The downtime created by a single piece of test equipment, whether due to maintenance or repair, directly impacts the bottom line, not only in terms of lost throughput, but the cost associated with getting a piece of equipment functioning and back in the test system.

While instrument reliability directly impacts downtime, it is not a complete indication of total cost of ownership. To gain a better understanding on how to minimize these costs, manufacturing managers should consider a broader perspective that includes not only reliability, but also calibration and repair.

The Agilent MXG signal generators are specifically designed with a lower cost of ownership. Driven by reliability and simplified self-maintenance, the Agilent MXGs effectively address the issues associated with the time and cost of calibration and repair.

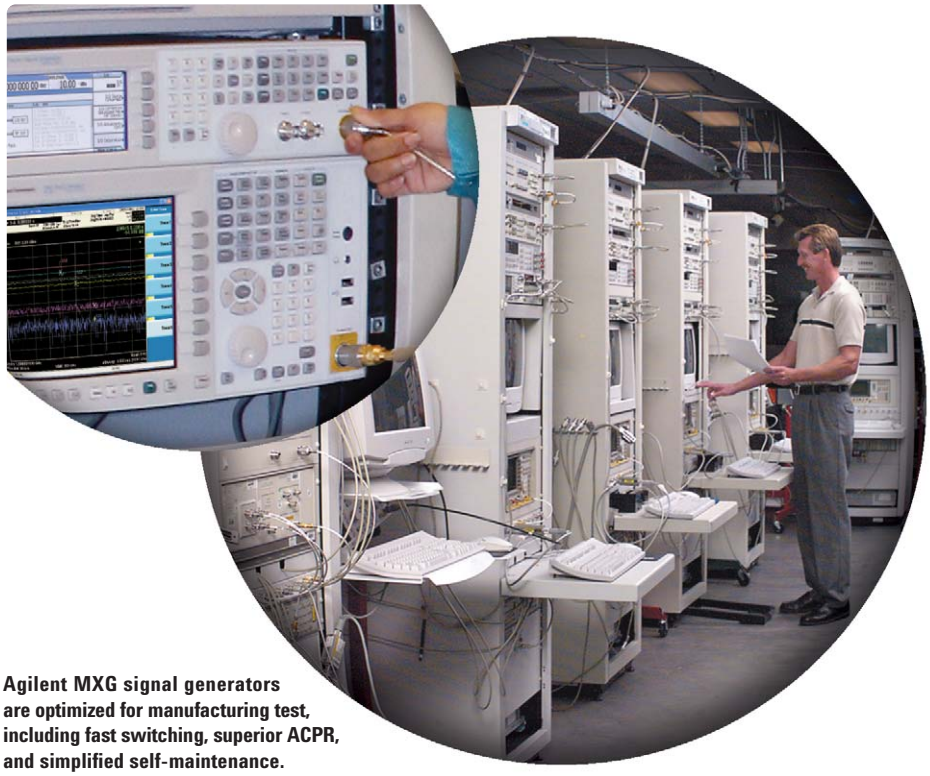
In two rack units, the Agilent MXG analog and vector signal generators offer performance that can be tailored for general-purpose applications, cellular communications component manufacturing, or even wireless networking receiver manufacturing. With a choice of frequency ranges, performance attributes, and Signal Studio software, you can scale the Agilent MXG to fit your needs.

General purpose test

With fast switching speeds, outstanding level repeatability and analog modulation, Agilent MXG analog is a reliable stimulus for applications ranging from simulating a clock signal to generating an interferer for receiver evaluation.

Advanced signal simulation

The combination of IQ modulation, superior dynamic range and Signal Studio software, make the Agilent MXG vector ideal for applications up to 6 GHz requiring W-CDMA, cdma2000®/1xEV-DO, GSM/EDGE, TD-SCDMA, WLAN, and mobile WiMAX (802.16-2005 OFDMA) test signals.



Agilent MXG signal generators are optimized for manufacturing test, including fast switching, superior ACPR, and simplified self-maintenance.

Agilent MXG at a Glance

Scalable performance

- Frequency coverage from **250 kHz to 6 GHz** (operational down to 100 kHz) for cellular and ISM-band communications test
- Accurate analog modulation including **AM, FM,** ϕM **and pulse modulation** for general purpose test
- **100 MHz RF BW** internal I/Q baseband generator for flexible signal simulation
- **160 MHz RF BW** with external I/Q inputs to up-convert your baseband signals to IF or RF

Improve test yield

- **Low distortion** with –76 dBc measured ACLR performance for a 1-carrier 3GPP W-CDMA signal[1] to reduce measurement uncertainty

Reduce test time and maximize uptime

- **Fast switching speeds**, ≤ 1.2 ms in SCPI mode and ≤ 900 µs simultaneous frequency, amplitude and waveform switching in list mode, to optimize throughput
- Reliable **electronic attenuator** to 6 GHz provides amplitude switching speed and repeatability

Easy to use

- **Color display** and familiar Agilent interface make for easy use
- **Embedded help system** guides new users through basic instrument functions and SCPI commands
- **USB port** for quick file transfer to flash memory, including Signal Studio waveforms, instrument states, and license keys

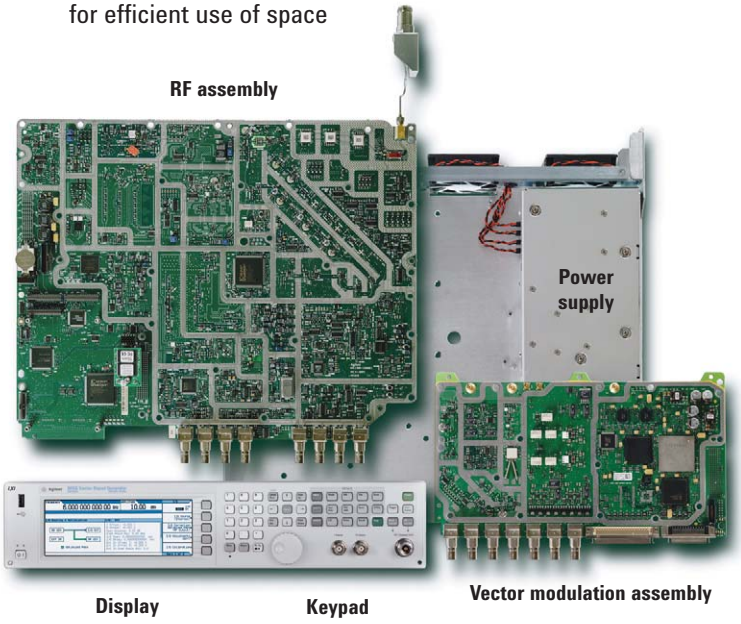
1. Test model 1, 64 DPCH

Simplify system integration

- **LXI class C compliance** helps you efficiently integrate Agilent MXG into your LAN-based test system
- **USB, GPIB, and LAN** connectivity for remote access
- **Tunable reference input** from 1 to 50 MHz for frequency locking to your system clock
- **10 MHz reference output** provides a stable reference for your test system
- **Backward code compatibility** makes for fast and easy replacement of Agilent and other signal generators[1]

Conserve rack space

- A small **2-rack-unit profile** for efficient use of space



Reliability and easy self-maintenance

- **Simple design** ensures reliable performance and fast maintenance and repair

1. Code compatible with Agilent E4438C, E4428C, E442XB, E443XB, 8648 series, 8656B, 8657A/B and other signal generators.

Agilent N5181A
MXG Analog Signal Generator

Fastest switching

Engineered for speed

Test times are only as fast as the slowest instrument in your test system. And long test times impact your capacity to build, forcing you to add resources and capital to meet throughput goals. Agilent MXG signal generators reduce the time required to test by providing the fastest switching speeds – at least twice as fast as other signal generators in SCPI mode.

- ≤ 1.2 ms in SCPI mode
- ≤ 900 µs in list mode

Agilent MXG not only reduces test time, but accelerates the start-up process by offering tools to simplify system configuration.

- LXI class C compliance
- USB, GPIB, and LAN connectivity
- Backward code compatibility with Agilent and other signal generators

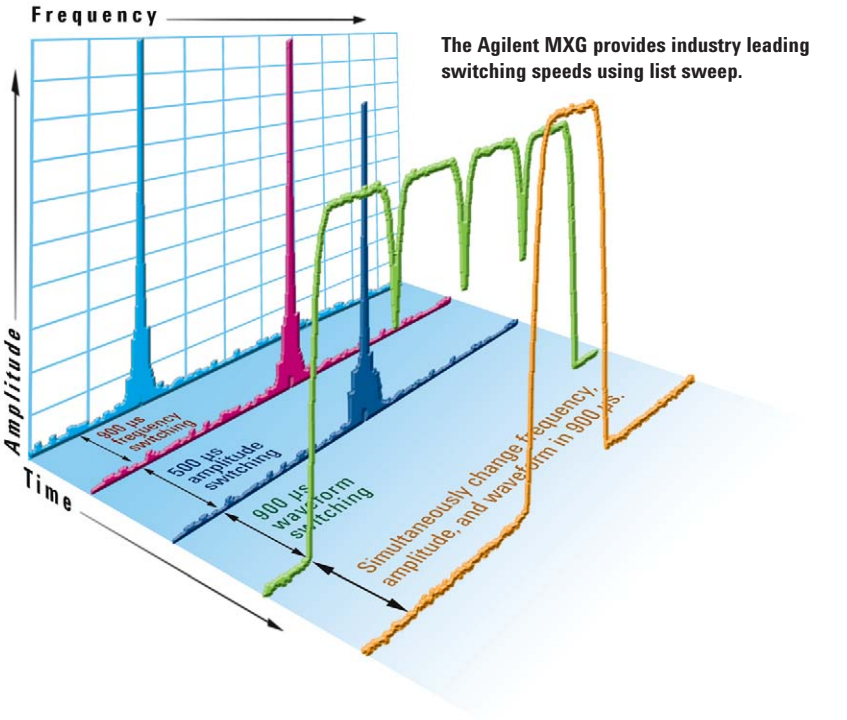
Key features

- Frequency range from 250 kHz[1] to 1, 3, or 6 GHz
- –127 to +13 dBm power levels[2]
- Fast switching speeds
- AM, FM, ϕM and pulse modulation
- Electronic attenuator
- Backward code compatibility

Fast and accurate analog signal generation

Time is critical on the component manufacturing floor. With industry-leading frequency and amplitude switching speeds, the Agilent MXG analog signal generator allows you to reduce test times and maximize throughput. And a flexible option structure lets you scale the Agilent MXG to meet your performance needs from design through production.

Agilent MXG provides the performance required for analog applications ranging from local oscillator substitution to receiver test. It is an accurate and repeatable test stimulus with superior level repeatability, ≤ –121 dBc/Hz phase noise, and an electronic attenuator up to 6 GHz. This enhanced signal quality leads to better measurement certainty, enabling you to improve test yield.

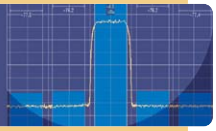


The Agilent MXG provides industry leading switching speeds using list sweep.

1. Tunable down to 100 kHz
2. Settable to -144 dBm

Agilent N5182A
MXG Vector Signal Generator

Superior ACPR



Industry's best ACPR for MCPA test

Devices such as MCPAs can generate unwanted signals outside the specified signal bandwidth. These unwanted signals interfere and distort signals in neighboring channels, which can cause bit errors. To improve channel usage, MCPA adjacent channel power levels are being driven lower.

Agilent MXG vector signal generators provide superior dynamic range and the only specified ACLR performance, –65 dBc, for a W-CDMA 4-carrier signal[1]. This reduces the error contribution from the test stimulus letting you accurately characterize your device. For manufacturers, better measurement accuracy translates to improved test yield and ultimately a lower cost of test.

Key features

- Frequencies from 250 kHz[2] to 3 or 6 GHz
- Fast switching speeds, including waveforms[3]
- Industry-best ACPR
- High-performance baseband generator
  - 100 MHz RF bandwidth
  - 64 MSa waveform playback memory
  - 100 MSa waveform storage memory, extendable with USB flash memory
  - 16 bit DAC resolution
- Electronic attenuator
- Backward code compatibility

Vector signal generation for component test

For cellular communications and wireless networking, the Agilent MXG vector signal generator adds vector modulation and the industry's best ACPR performance to the speed of the analog model, making it ideal for high-volume component manufacturing. And, with an attractive price point and a scalable option structure, the Agilent MXG vector is a good solution for designing and manufacturing wireless networking receivers.

In addition to fast frequency and amplitude switching times, the Agilent MXG vector also offers the unique ability to *simultaneously* switch waveforms in ≤ 900 µs to further accelerate testing[3]. A 100 MHz bandwidth internal baseband generator and wideband IQ modulation provide a versatile means of generating complex arbitrary waveforms for communications standards ranging from 3GPP W-CDMA to mobile WiMAX. Agilent MXG vector's performance, combined with Signal Studio software let you confidently verify your design on the lab bench or the production line.

The Agilent MXG provides the best and only specified ACLR performance for a W-CDMA 4-carrier test signal: –65 dBc specified, –70 dBc measured[1].

1. Test Model 1, 64 DCPH
2. Tunable down to 100 kHz
3. When switching waveforms, other waveform header parameters like sample rate and IQ drive level may be set.

Agilent Signal Studio Software

Flexible signal creation tools

Flexible options and licensing

The ability to adapt quickly is paramount on the production line. Signal Studio supports transportable and time-based licensing for the Agilent MXG vector, enabling ultimate flexibility when defining your test system:

- *Transportable* licenses can be moved from one signal generator to another
- *Time-based* licensing lets you choose the tools you need only for the timeyou need it

Signal Studio also provides options to let you pick the level of performance right for your test needs:

- *Basic* capability provides spectrally correct signals for component test
- *Advanced* capability adds full channel coding for receiver test

Verified and optimized reference signals

Signal Studio is a suite of PC-based software designed to reduce the time spent on custom signal creation while enabling you to better characterize your design. Use the software to configure standards-based waveforms for playback with the Agilent MXG vector signal generator. The software provides an intuitive user interface to access pre-defined set-ups or modify signal parameters to create custom reference signals. And, a flexible option structure lets you select the performance you need for the time you need it.

The right applications at the right time

Signal Studio software has a proven first-to-market track record, keeping you on the leading edge of communications standards and continual enhancements keep you current with evolving standards. Use Signal Studio with the Agilent MXG vector and you have flexible, application-specific signal generation.

Mobile WiMAX receiver test

The emergence of WiMAX, and now 802.16e mobile WiMAX, continues to fuel growth in the broadband wireless access market. R&D engineers developing 802.16e receivers and components need signal generation and analysis tools to verify that their design meets the WiMAX Forum's still-evolving conformance test requirements.

Agilent MXG vector with N7615B Signal Studio for 802.16 WiMAX provides standards-based single or multicarrier signals for component test or receiver evaluation, including receiver sensitivity and adjacent channel rejection. With 0.4% typical EVM and –68 dBc typical distortion performance[1], Agilent MXG provides the performance needed to evaluate receiver designs.

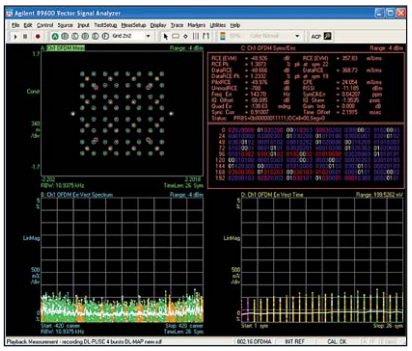
To further assist WiMAX developers, Agilent N9020A MXA signal analyzer provides 25 MHz analysis bandwidth for demodulation of WiMAX signals. Combined, Agilent MXG and MXA make a complete and fast WiMAX test system for design and production environments.

Agilent MXG and MXA are a complete solution for testing wireless networking components and receivers.

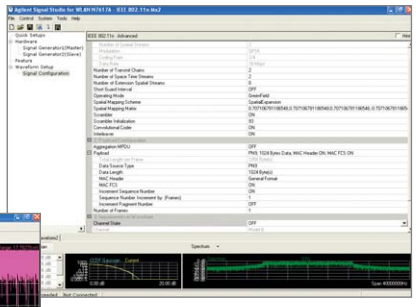
Create test signals for wireless networking

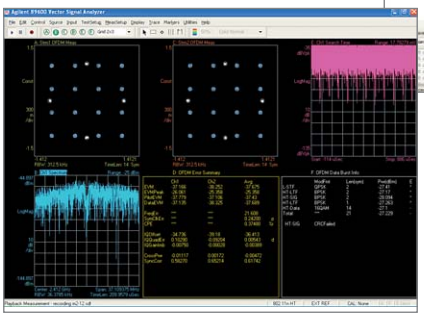
N7615B Signal Studio for 802.16 WiMAX

- Basic and advanced multicarrier 802.16e OFDMA signal creation
- Configure frames for both downlink and uplink
- Access to both physical and basic MAC layer parameters
- Flexible configuration of zones, bursts and MAC PDUs
- Choice of 512, 1024, or 2048 FFT sizes with variable bandwidths
- Built in COM-based API control



Mobile broadband wireless access test





Test components for WLAN access point and portable stations

N7617B Signal Studio for 802.11 WLAN

- Basic and advanced 802.11a/b/g/j/p/n signal creation
- Multicarrier 802.11 a/b/g/j/p
- MAC layer configuration and simulation
- Flexible 802.11n transmit link configuration and MIMO channel simulation settings
- Built in COM-based API control

1. 802.16e OFDMA 10 MHz bandwidth signal with QPSK modulation at < 7 dB output power. For more information see the Agilent MXG vector data sheet (5989-5261EN).

Try before you buy

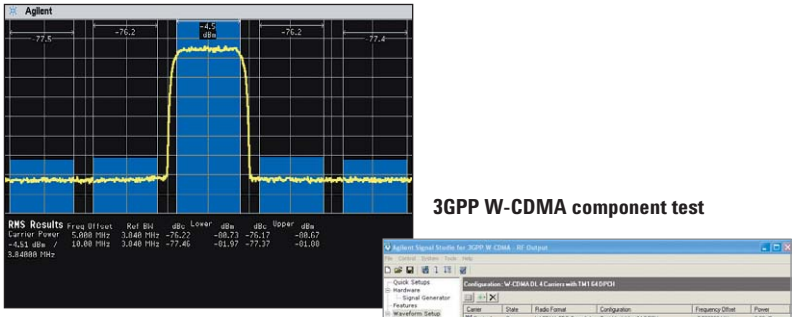
Download Signal Studio to a PC and redeem a free 14-day trial license. Investigate the signal creation capabilities of the software prior to purchase.

www.agilent.com/find/signalstudio

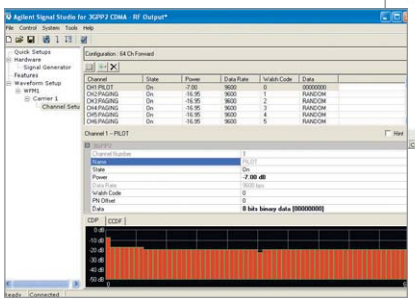
Configure cellular communications test signals

N7600B Signal Studio for 3GPP W-CDMA FDD

- W-CDMA, HSDPA and HSUPA mixed-signal creation
- Multicarrier configuration including clipping, timing and phase offsets
- Waveform creation including transceiver diversity
- Built in COM-based API control



3GPP W-CDMA component test



cdma2000 and 1xEV-DO waveforms for power amplifier test

N7601B Signal Studio for 3GPP2 CDMA

- cdma2000, IS95, 1xEV-DO multicarrier mixed-signal creation
- Basic cdma2000 and 1xEV-DO capability for component test
- Advanced 1xEV-DO capability for receiver test
- 1xEV-DO Rev0 reverse link coded signals
- 1xEV-DO RevA reverse and forward link coded signals
- Built in COM-based API control

N7602B Signal Studio for GSM/EDGE

- 3GPP 51010-1 (Mobile) and 3GPP 51021 (base station) coded signals
- Flexible, mixed timeslot SMDK/8PSK formatting
- GSM/EDGE multicarrier creation
- Basic mode GSM/EDGE signal generation for component test
- Built in COM-based API control

N7612B Signal Studio for TD-SCDMA

- Support physical and transport channels for TD-SCDMA and HSDPA
- Pre-coded reference measurement channels
- Multicarrier signal creation
- Flexible channel coding, time slot and frame formatting
- Built in COM-based API control

Maximize Uptime
on the Manufacturing Line

Designed for long term dependability in production environments with a focus on reliability and simplified-self maintenance, the Agilent MXG helps you maximize uptime and lower cost of ownership. Agilent MXG's architecture, comprised of just five sub-assemblies, increases system integrity without sacrificing performance. It also enables Agilent to offer innovative self-maintenance that reduces potential downtime on your manufacturing line.

Simplified self-maintenance

What is simplified self-maintenance?

Simplified self-maintenance for the Agilent MXG is an alternative to traditional maintenance and repair choices. Maintaining the MXG in-house empowers you to actively manage downtime, while maximizing uptime and reducing your total cost of ownership.

Quick calibration
Using a spectrum analyzer, a power meter, and Agilent's calibration software, you can verify the performance of the Agilent MXG down to -110 dBm in less than 1 hour.

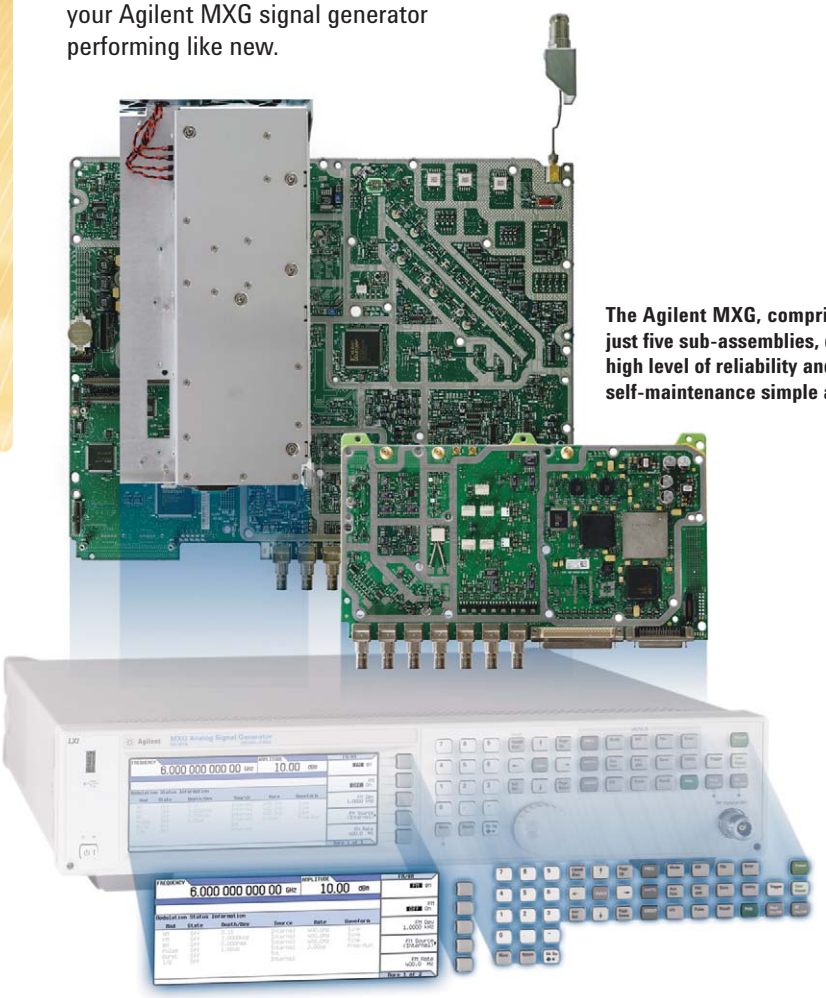
Onsite repair
Should a failure occur, the Agilent MXG is quick and easy to repair. Repair assemblies are field-orderable and come fully adjusted and certified. Onsite repair can be done in as little as 30 minutes.

Reliability

The Agilent MXG delivers a high level of reliability and therefore overall quality that dramatically reduces the mean time between failures and delivers one of the lowest annual fail rates in the industry. This includes a wear-free electronic attenuator for frequencies up to 6 GHz to ensure fast, repeatable results.

Calibration and repair

The Agilent MXG support strategy lets you decide how to manage your equipment to maximize system uptime. Elect to self-maintain you Agilent MXG – perform calibration and repairs onsite with Agilent calibration software, 100% self diagnostics and field-orderable and replaceable assemblies – and ensure a fast return to the production line. Alternatively elect to have maintenance done through one of Agilent's local service centers to keep your Agilent MXG signal generator performing like new.



The Agilent MXG, comprised of just five sub-assemblies, delivers a high level of reliability and makes self-maintenance simple and fast.

Specification Summary[1]

Frequency range

N5181A	250 kHz[2] to 1, 3, or 6 GHz
N5182A	250 kHz[2] to 3 GHz

Switching speed	Standard	Option UNZ
Frequency		
SCPI mode	≤ 5 ms	≤ 1.15 µs
List mode	≤ 5 ms	≤ 900 µs
Amplitude		
SCPI mode	≤ 5 ms	≤ 750 µs
List mode)	≤ 5 ms	≤ 500 µs

Amplitude

Range	Standard	Option 1EQ[3]
250 kHz to 2.5 GHz	–110 to +13 dBm	–127 to +13 dBm
> 2.5 to 3.0 GHz	–110 to +10 dBm	–127 to +10 dBm
> 3.0 to 4.5 GHz	–110 to +13 dBm	–127 to +13 dBm
> 4.5 to 5.8 GHz	–110 to +10 dBm,	–127 to +10 dBm
> 5.8 to 6.0 GHz	–110 to +7 dBm,	–127 to +7 dBm

Absolute level accuracy for CW signals

(–60 to +7 dBm, within 20 to 30 °C)

250 kHz to 1 MHz	± 0.5 dB
> 1 MHz to 1 GHz	± 0.6 dB
> 1 to 3 GHz	± 0.7 dB
> 3 to 6 GHz	± 0.8 dB

Single sideband phase noise (typical at 20 kHz offset)

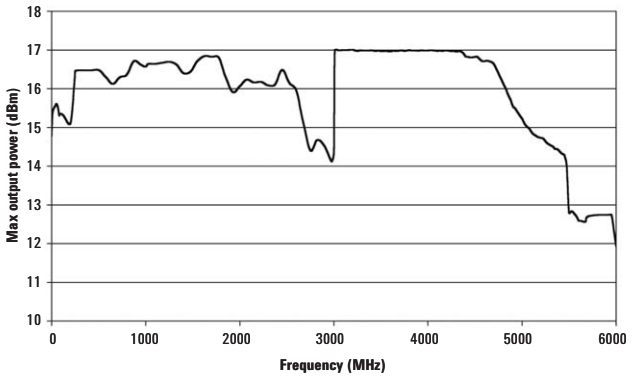
500 MHz	≤ –126 dBc/Hz
1 GHz	≤ –121 dBc/Hz
2 GHz	≤ –115 dBc/Hz
3 GHz	≤ –110 dBc/Hz
6 GHz	≤ –104 dBc/Hz

Harmonics (CW mode, output level < 4 dBm)

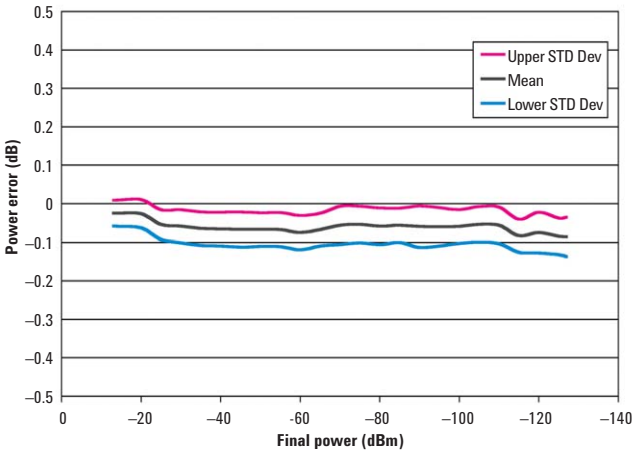
≤ 3 GHz	< –30 dBc
> 3 to 6 GHz	< –44 dBc (typ)

Analog modulation

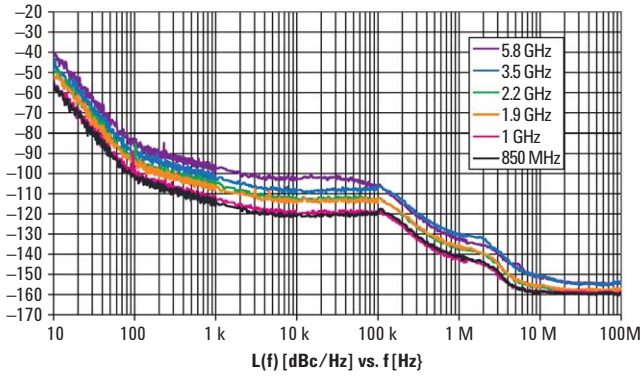
AM	Depth	90%
FM	Maximum deviation (6 GHz)	20 MHz (nom)
ϕM	Maximum deviation (6 GHz)	20 radians
Pulse modulation	Rise/fall time	< 50 ns (typ)
	Minimum pulse width	≥ 500 ns (ALC off)
	On/Off ratio	> 80 dB (typ)



Measured maximum output power



Measured relative level accuracy at 850 MHz initial power +10 dBm



Typical phase noise

1. Specifications subject to change. For detailed specifications refer to the data sheets (analog: 5989-5311EN; vector: 5989-5261EN).
2. Tunable to 100 kHz.
3. Settable down to –144 dBm.

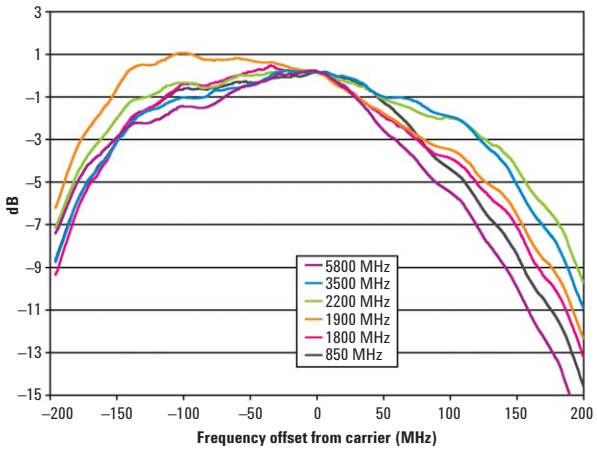
Additional Vector Specifications [1]

Baseband generator features (Options 651, 652, 654)

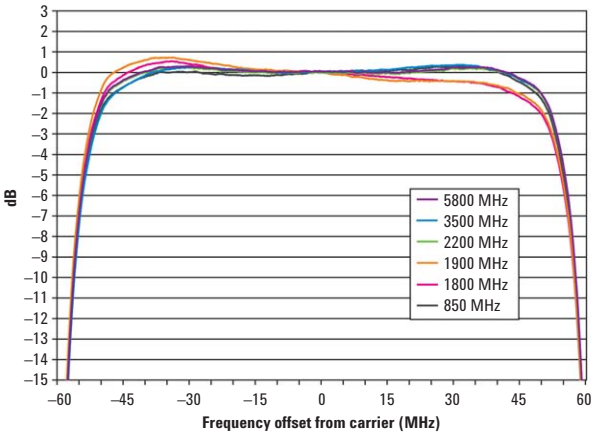
Maximum playback capacity	8 MSa, 64 MSa Option 019	
Sample rate	1 kSa/s to 30, 60, or 125 MSa/s	
Bandwidth	24, 48, or 100 MHz	
Effective DAC resolution	11 bits (standard) or 16 bits (Option UNV)	
Waveform switching in list sweep mode	**Standard**	**Option UNZ**
	≤ 5 ms	≤ 900 µs (typ)

Typical ACPR and EVM performance data [2]

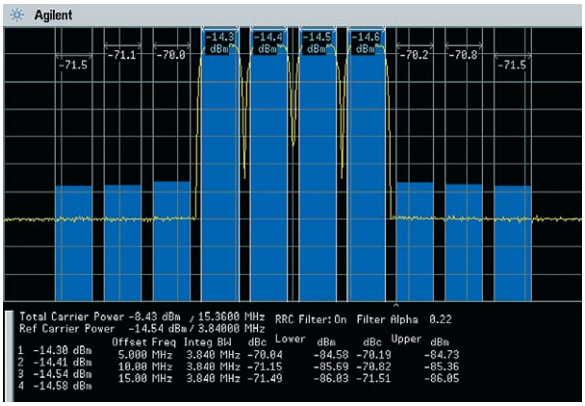
Format	ACPR (Option UNV)	EVM
GSM	–86 dBc	rms 0.2 ° peak 0.6 °
EDGE	–85 dBc	0.7%
cdma2000/1xEV-DO	–93 dBc	1.3%
W-CDMA		
1-carrier	–73 dBc –76 dBc (meas) –71 dBc (spec)	0.8%
4-carrier	–67 dBc –70 dBc (meas) –65 dBc (spec)	0.8%
802.11a/g	—	0.5%
WiMAX	–68 dBc	0.4%
QPSK	—	0.8%
16QAM	—	0.6%



Bandwidth of IQ modulator using external I/Q source (ALC off)



I/Q bandwidth of optional internal baseband generator



4-carrier 3GPP W-CDMA signal with Test Model 1, 64 DPCH

1. Specifications are subject to change. For detailed specifications, refer to the vector data sheet (5989-5261EN).
2. Values provided are typical (unless indicated otherwise) for specific signal configurations. For detailed specifications, please refer to the data sheet.

Ordering Information

Explore the Agilent MXG online

Access the latest product literature, application notes, options, and pricing. Or request a quick quote. Visit:

www.agilent.com/find/mxg

Agilent N5181A MXG analog signal generator

Frequency options

501	250 kHz to 1 GHz
503	250 kHz to 3 GHz
506	250 kHz to 6 GHz

Performance options

UNZ	Fast switching
1EQ	Low power
UNT	AM, FM, ϕM
UNU	Pulse modulation

Other options

006	Instrument security
1EM	Move RF output to rear panel
1ER	Flexible reference input (1 to 50 MHz)
UK6	Commercial calibration certificate

Agilent N5182A MXG vector signal generator

Frequency options

503	250 kHz to 3 GHz
506	250 kHz to 6 GHz

Performance options

UNZ	Fast switching
1EQ	Low power
UNT	AM, FM, ϕM
UNU	Pulse modulation
UNV	Enhanced dynamic range

Other options

006	Instrument security
1ER	Flexible reference input (1 to 50 MHz)
1EM	Move RF output to rear panel
UK6	Commercial calibration certificate

Baseband generator options

651	Internal baseband generator (30 MSa/s, 8 MSa)
652	Internal baseband generator (60 MSa/s, 8 MSa)
654	Internal baseband generator (125 MSa/s, 8 MSa)
019	Increase baseband generator memory to 64 MSa
1EL	Differential I/Q outputs
403	Calibrated AWGN

Signal Studio software

N7600B	Signal Studio for 3GPP W-CDMA FDD
N7601B	Signal Studio for 3GPP CDMA
N7602B	Signal Studio for GSM/EDGE
N7612B	Signal Studio for TD-SCDMA
N7615B	Signal Studio for 802.16 WiMAX
N7617B	Signal Studio for 802.11 WLAN

The Agilent MXG
Whole Product Solution

Pre-sales services...

including rentals, leasing, financing and trade-up programs make the purchasing process hassle free.
com/find/financial_solutions

Post-sales support...

includes standard warranty, worldwide call centers, and free firmware upgrades for more capabilities.

Start-up assistance...

helps you get on track quickly and Agilent literature keeps you up-to-date on the latest technology.
www.agilent.com/find/training

LXI class C compliant LAN interface...

simplifies system integration. USB and GPIB connectors provide universal connectivity. **www.agilent.com/find/lxi**

Agilent service centers...

Remove all doubt

When self-maintenance does not meet your needs, use Agilent worldwide service centers to keep your Agilent MXG performing like new. Have it repaired and calibrated by the company that made it. Only Agilent can ensure that your equipment maintains its highest levels of performance with prompt turnaround time.
www.agilent.com/find/removealldoubt

Additional Resources

Literature

Agilent N5181A
MXG Analog Signal Generator,
Data Sheet, 5989-5311EN

Agilent N5182A
MXG Vector Signal Generator,
Data Sheet, 5989-5261EN

Agilent MXG Signal Generators,
Configuration Guide, 5989-5485EN

Accurate Amplifier ACLR and ACPR Testing with the Agilent MXG Vector Signal Generator, Application Note, 5989-5471EN

Improving Throughput with Fast RF Signal Generator Switching, Application Note, 5989-5487EN

Web

For more information or to view product literature on-line, please visit:
www.agilent.com/find/mxg

Remove all doubt

Without a doubt, our repair and calibration services will get your equipment back to performing like new. Without a doubt, we will get it back to you fast and when promised. We help you get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts, drawing from our unique access to the factory experts when necessary. This means that you will always have the utmost confidence in your measurements, so remove all doubt – use Agilent repair and calibration services for your instruments.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance, onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to:

www.agilent.com/find/removealldoubt

Agilent Email Updates

www.agilent.com/find/emailupdates
Get the latest information on the products and applications you select.

Agilent Open

LXI

www.agilent.com/find/open
Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.

www.agilent.com

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Phone or Fax

United States:
(tel) 800 829 4444
(fax) 800 829 4433

Canada:
(tel) 877 894 4414
(fax) 800 746 4866

China:
(tel) 800 810 0189
(fax) 800 820 2816

Europe:
(tel) 31 20 547 2111

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Korea:
(tel) (080) 769 0800
(fax) (080)769 0900

Latin America:
(tel) (305) 269 7500

Taiwan:
(tel) 0800 047 866
(fax) 0800 286 331

Other Asia Pacific Countries:
(tel) (65) 6375 8100
(fax) (65) 6755 0042
Email: tm_ap@agilent.com
Revised: 08/03/06

Product specifications and descriptions in this document subject to change without notice.

Printed in USA, September 1, 2006
5989-5074EN

Agilent Technologies