



Agilent MXA Signal Analyzer

N9020A

20 Hz to 3.6, 8.4, 13.6, or 26.5 GHz

Eliminating the Compromise Between Speed and Performance



- 30 to 300% faster than other analyzers
- 25 MHz analysis bandwidth
- +15 dBm TOI, -154 dBm/Hz DANL
- 0.3 dB absolute amplitude accuracy
- 78 dB W-CDMA ACLR dynamic range
- Spectrum analysis, WiMAX, W-CDMA, HSDPA/HSUPA and phase noise applications
- World's leading 89601A vector signal analysis software runs inside MXA

The next generation in signal analysis



Agilent Technologies

Summary of Key Specifications

Fastest signal analysis

30-300% faster than other analyzers

Superior performance

25 MHz analysis bandwidth
78 dB ACLR

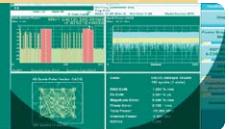
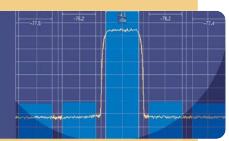
Broadest set of applications

Enhanced spectrum analysis
Measurement specific software applications
Complex signal analysis and troubleshooting

Modern connectivity

USB – seven ports
LAN – 100 based-T
GPIB
LXI – class-C compliant

www.agilent.com/find/MXA



Frequency ranges

Option 503	20 Hz to 3.6 GHz
Option 508	20 Hz to 8.4 GHz
Option 513	20 Hz to 13.6 GHz
Option 526	20 Hz to 26.5 GHz

Measurement speed

Local measurement and display update	< 11 ms
Remote measurement and LAN transfer	< 4 ms
Marker peak search	< 5 ms
Center frequency tune and transfer (RF)	< 51 ms
Center frequency tune and transfer (μ W)	< 86 ms
Measurement/mode switching	< 75 ms
W-CDMA ACLR fast measurement mode	< 14 ms ($O = 0.2$ dB)

Analysis bandwidth

Standard	10 MHz
Option B25	25 MHz

W-CDMA ACLR dynamic range (typ)

73 dB
78 dB noise correction on

Absolute amplitude accuracy, 20 Hz to 3.6 GHz

± 0.3 dB

Displayed average noise level with preamp on (Options P03, P08, P13, P26) – DANL (typ)

1 GHz	-166 dBm
7 GHz	-164 dBm
13 GHz	-164 dBm
20 GHz	-160 dBm

Displayed average noise level – DANL (typ)

1 GHz	-154 dBm
7 GHz	-153 dBm
13 GHz	-150 dBm
20 GHz	-145 dBm

Third-order intermodulation distortion – TOI

1 GHz	+15 dBm
7 GHz	+15 dBm
13 GHz	+15 dBm
20 GHz	+10 dBm

Phase noise (typ)

-106 dBc/Hz at 10 kHz offset

Resolution bandwidths

1 Hz to 3 MHz (10% steps), 4, 5, 8 MHz

Video bandwidths

1 Hz to 3 MHz (10% steps), 4, 5, 8, 50 MHz

Frequency reference

Aging rate with Option PFR $\pm 1 \times 10^{-7}$ /year

Sweep time

Span = 0 Hz	1 μ s to 6000 s
Span \geq 10 Hz	1 ms to 4000 s

Trace Points

All spans 1 to 20001

World's Fastest Signal Analysis

You know every millisecond matters.

So do we.

Increase manufacturing throughput and reduce cost-of-test

In the world of high-speed manufacturing, every millisecond counts. How much is a 100 ms reduction in measurement speed worth in your manufacturing operation? For one of our customers, a 100 ms reduction is worth \$1 million per quarter. At 30 to 300% faster than other signal and spectrum analyzers, the MXA reduces test times and increases throughput.

- < 14 ms W-CDMA ACLR fast mode measurement speed ($O = 0.2$ dB)
- < 5 ms marker peak search
- < 51 ms tune, measure, and transfer over GPIB
- < 75 ms measurement/mode switching speed for seamless switching between mobile WiMAX, W-CDMA, HSDPA/HSUPA, phase noise and 89601A VSA (vector signal analysis) software

List sweep

Save measurement time by programming the MXA analyzer for fast power measurements using the list sweep feature. Remotely extract amplitude values at known frequencies by making a list of single-point measurements in advance. The MXA can run through the measurements without requiring you to reset the analyzer for each iteration of a measurement cycle.

- Make multiple zero span measurements at multiple frequencies
- Choose different resolution bandwidths, video bandwidths, detector types, and sweep times at different sweep points
- Obtain peak and average power measurement results

Fastest signal analysis



At Agilent, we continuously review feedback from our customers. Design validation and manufacturing floor engineers and managers agree speed is most important to them. With this in mind, Agilent continues to compare the MXA's measurement speed against other signal and spectrum analyzers in the industry. The measurement results reveal that the MXA is **30 to 300% faster** than other signal or spectrum analyzers, regardless of the frequency range.

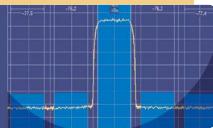


For fast signal generation, see the new Agilent MXG signal generator — optimized for manufacturing
www.agilent.com/find/mxg

Highest Performance Midrange Signal and Spectrum Analyzer

Imagine the possibilities

Superior performance



The MXA's great performance is much more than just its industry-leading specifications. Performance is also measured by the:

- depth and breadth of measurement applications
- innovation behind software and hardware architecture
- scalability and ease of upgrades
- advanced user interface
- brightness and clarity of display, and more.

At Agilent, our decades of spectrum analyzer design experience have enabled us to provide you with powerful performance supported by industry-leading measurement science.

Up to 25 MHz analysis bandwidth

Make measurements of mobile or fixed WiMAX, multi-carrier W-CDMA, and other wideband signals using:

- 802.16 OFDMA and W-CDMA measurement applications
- 89601A VSA software
- CCDF measurements up to 25 MHz
- 90 MSamples/sec, 14 bit ADC

Fully calibrated internal preamplifiers up to 26.5 GHz

Analyze low level signals on the only midrange analyzer to offer a choice of fully calibrated internal preamplifiers up to 26.5 GHz.

- Four different preamp frequencies are available: 100 kHz to 3.6, 8.4, 13.6, or 26.5 GHz
- Select preamp frequency up to the maximum frequency of the instrument
- Gain: +20 dB from 100 kHz to 3.6 GHz and +35 dB from 3.6 to 26.5 GHz

Mechanical or electronic attenuator

Small step sizes enable you to optimize the mixer level for maximum dynamic range. MXA's electronic attenuator is able to withstand millions of switches – making it ideal for high speed manufacturing.

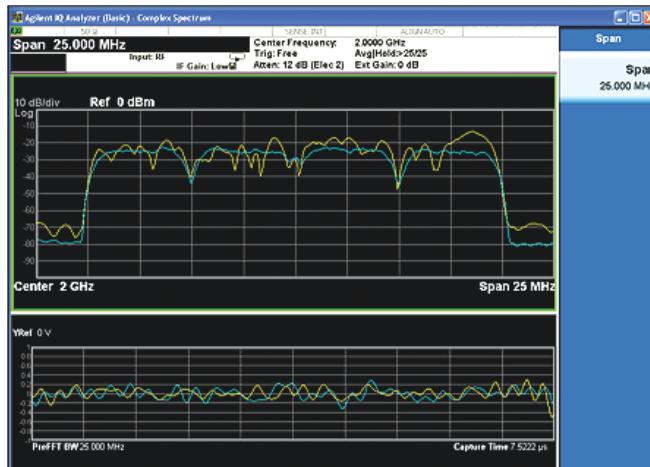
- Mechanical: 2 dB steps, 0 to 70 dB attenuation range
- Electronic: 1 dB steps, 0 to 24 dB attenuation range

Key performance specifications

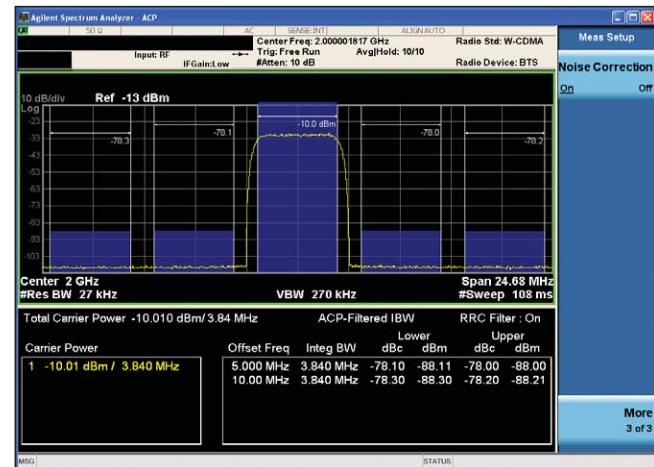
- +15 dBm third-order intercept (TOI)
- -154 dBm/Hz displayed average noise level (DANL)
- 0.3 dB absolute amplitude accuracy
- 78 dB W-CDMA ACLR dynamic range

Open Windows® XP Professional operating system

- Manage files easily and quickly using Windows Explorer
- Run MATLAB® and the 89601A vector signal analysis software inside the MXA
- Trouble shoot and control the MXA via Windows Remote Desktop software or with the embedded web server (LXI class-C compliant)



25 MHz bandwidth for WiMAX and other broadband signals



78 dB W-CDMA ACLR dynamic range

Use the MXA in Both Product Development and Manufacturing

Use the MXA to test your designs, for design verification, and in manufacturing. Enable reuse of test code from the development team into manufacturing, and assure trusted measurement algorithms are used for the product's entire development cycle. Parallel development in manufacturing and R&D enables fast time-to-market.

Performance required for product development

For product development engineers

Whether you are:

- developing RF, microwave, or wireless communication products,
- ensuring mobile communication designs comply with strict standards (single- or multi-format),
- evaluating or designing products to pre-release and ratified WiMAX standards or other emerging standards, or
- designing and testing components and power amplifiers, the MXA provides the highest performance and accuracy in a midrange signal or spectrum analyzer to help you solve design challenges faster with fewer iterations and increased confidence.

Speed required for manufacturing

For manufacturing engineers

Whether you are:

- measuring complex modulated signals,
- expediting automated tests,
- under pressure to be first to deliver products to market, or
- troubleshooting problems to minimize failures, the MXA provides the fastest, most accurate signal and spectrum analysis measurements in a midrange analyzer to help you dramatically increase throughput and yields.

Since the MXA is 30 to 300% faster than other signal and spectrum analyzers, the MXA enables you to run more tests in the same amount of time as your current analyzer. Or, you can use fewer analyzers for the same number of tests.

Eliminating the compromise between speed and performance



Need Even Higher Performance?

When even higher performance is needed, the Agilent PSA Series spectrum analyzer offers the highest performance. The PSA has an all digital IF and is the only high performance analyzer with 14 bit ADC resolution over the full 80 MHz analysis bandwidth. The PSA has the widest dynamic range in a performance analyzer and best amplitude accuracy at ± 0.24 dB; and TOI is +19 dBm.



The Next Generation...

Eliminating the compromise between speed and performance

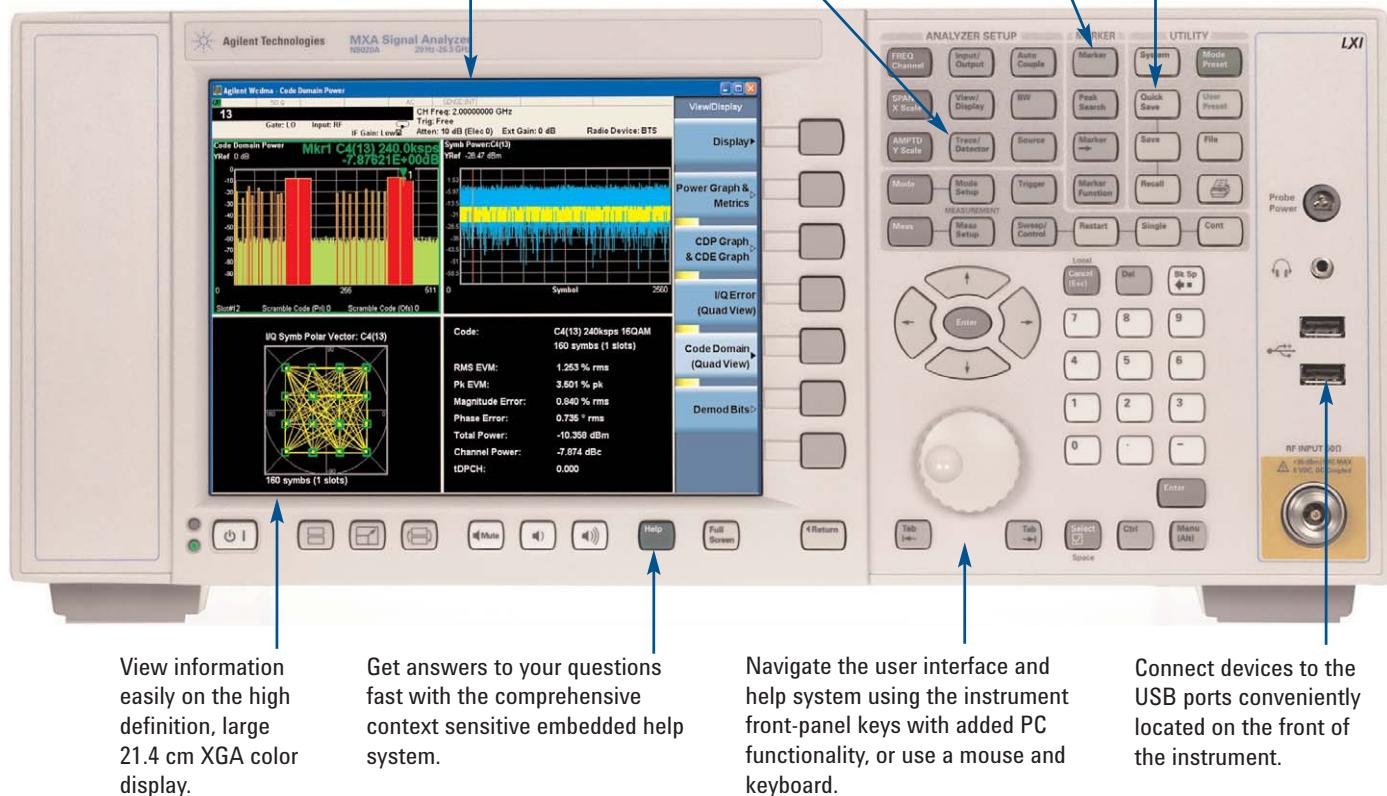
The MXA signal analyzer drives signal and spectrum analysis to the next generation offering the highest performance in a midrange analyzer. Innovative breakthroughs enable the MXA signal analyzer to achieve the industry's fastest signal and spectrum analysis.

Identify signals quickly. Active functions and other instrument information are located the top and bottom of the screen, leaving the rest of the screen clear to display your measurement results.

Use 6 traces and
3 different detectors
simultaneously.

Mark the frequency or position of a trace with up to 12 markers that enable easy viewing of measurement results.

Save files quickly and conveniently at the touch of a button with the quick-save feature.



...in Signal Analysis



Benefit from the next generation

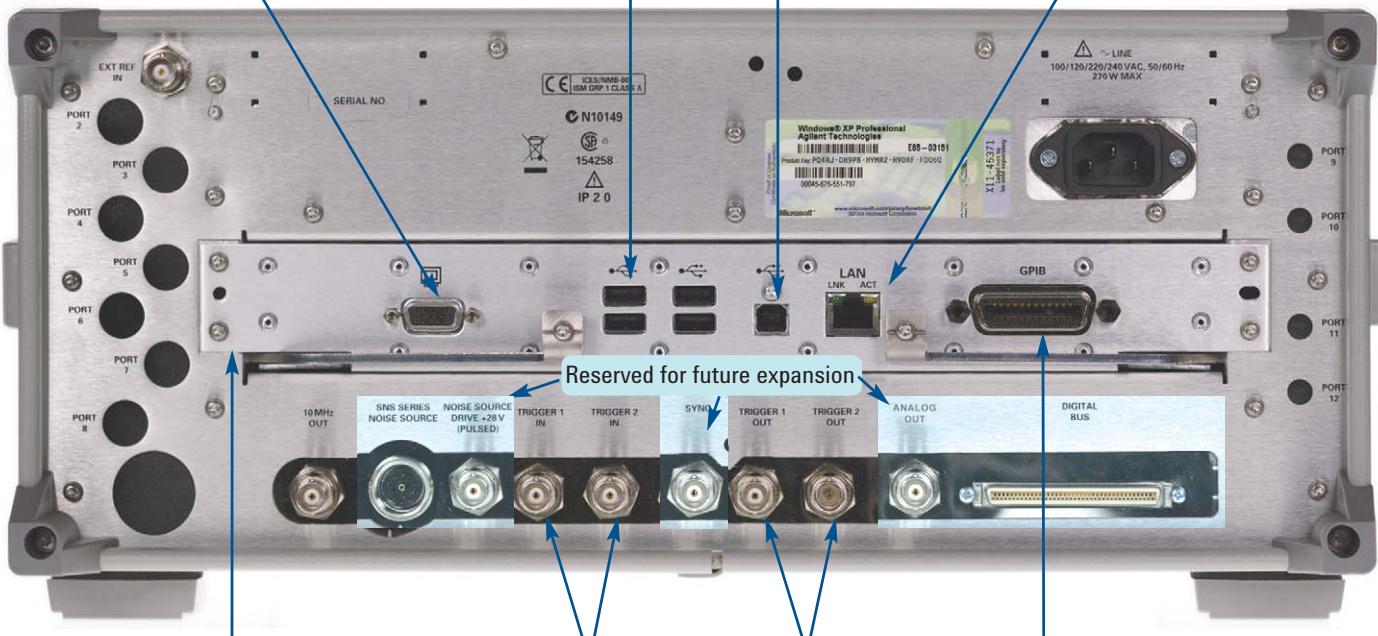
- Excellent speed and performance – no compromise
- Open Windows XP Pro operating system
- Spectrum and vector signal analysis all in one instrument
- A wealth of features that are included as standard
- Comprehensive context sensitive help system inside the MXA – any key, any menu, anytime
- All digital IF with 14 bit ADC resolution
- Modern connectivity

View the display on an external monitor by connecting it to the VGA video monitor out.

Connect external peripherals, such as a DVD drive, keyboard, mouse, and USB flash drive, and transfer data via the 2.0 USB (type-A port) interface.

Acquire IQ waveform data quickly and control the MXA remotely from an external PC over the USB 2.0 (type-B port) interface.

Control the MXA remotely over the 100 based-T LAN interface.



Upgrade the platform easily in the future. Removable CPU tray and hard disk drive. Expansion slots to enable future capability.

Start measurements based on a specific incident using an external trigger input signal.

Synchronize other test equipment with the analyzer using the external trigger output signals.

Send and receive SCPI commands over the GPIB interface.

Enhanced Spectrum Analysis

Spectrum analysis with an advanced user interface

Broadest set of applications



Enhanced spectrum analysis (standard)

- Exceptional tool for **both R&D and manufacturing**; portable configuration available
- Traditional spectrum analysis; plus many new and enhanced functions only available on the MXA
- Power measurements based on industry specifications; SCPI programmable

Measurement-specific software applications (optional)

- Optimized for **speed in manufacturing**; an excellent tool for R&D
- W-CDMA, HSDPA/HSUPA, WiMAX, and phase noise measurement applications
- Complete measurement functions with a single button press or SCPI command

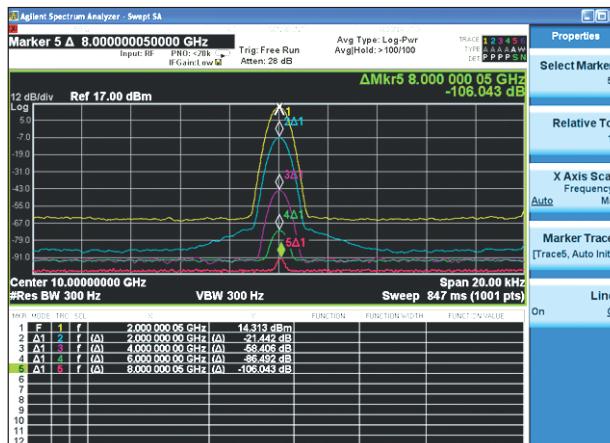
Complex signal analysis and troubleshooting (optional)

- Primarily an **R&D design and troubleshooting tool**; can also be used in manufacturing
- Industry-leading 89600A vector signal analysis (VSA) software with over 30 standards-based demodulators
- No charge for 14-day trial license

Spend less time learning how to use your new signal analyzer, and more time on your design with Agilent's familiar yet enhanced user interface. Based on customer feedback and experience with the ESA and PSA analyzers, Agilent has made enhancements and created unique new features for an improved user interface and greater usability. Some of these new features and functionality are only available on the MXA signal analyzer, making it Agilent's most advanced user interface to date.

Auto tune feature

Save setup time with the auto tune feature. At the press of a button, a mathematical algorithm is executed that automatically changes the analyzers center frequency to the strongest signal in the tunable span of the analyzer, adjusts the span to three times the occupied bandwidth of the signal, sets the resolution and video bandwidth, optimizes the reference level, performs a peak search, sets a marker on the peak, and displays the measurement result. A patent has been applied for this feature.

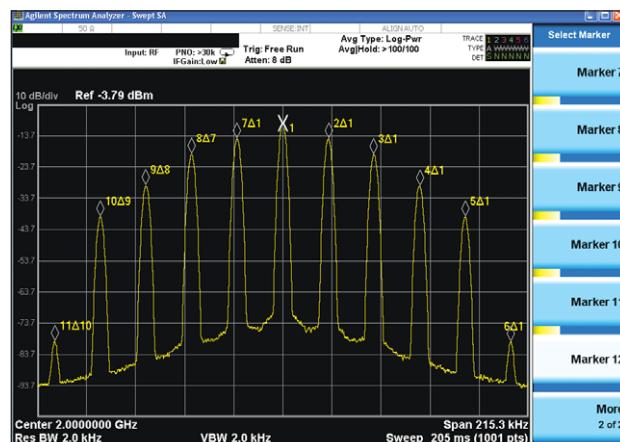


Multiple Trace feature

Display up to six traces, such as a carrier plus up to five harmonics, in the same display window.

Marker feature

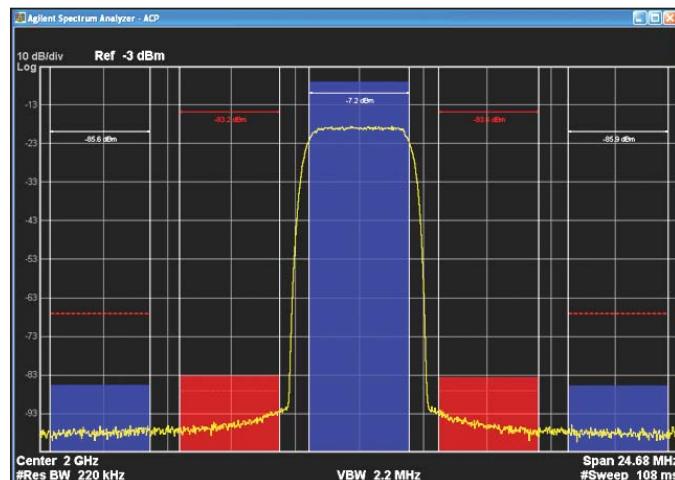
Determine the precise value at each trace point quickly with the advance marker capability. Twelve markers, either frequency or position based, are available. Any marker can be a reference for other markers.



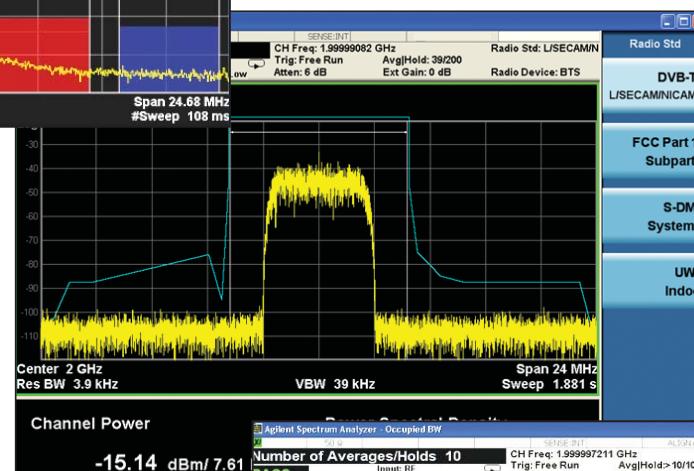
Enhanced Spectrum Analysis (continued)

Standards-based power measurements

The spectrum analysis capability in the MXA provides both standards-based power measurements and traditional, yet enhanced spectrum analysis. Power Suite, a subset of the spectrum analyzer capability, provides a comprehensive set of flexible, one-button RF and microwave power measurements. Wireless standards-based setups include: 2G/3G, WLAN, *Bluetooth*®, UWB, and S-DMB. Use the more than 75 quick setups or use custom settings for specific power measurements that are not already preconfigured.

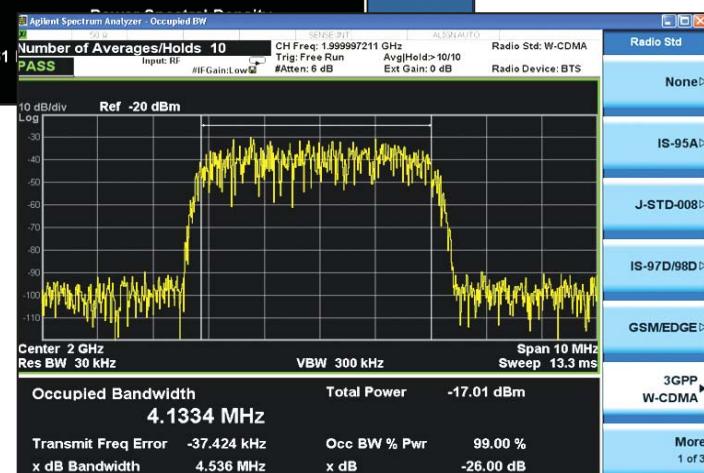


One-button ACP
measures up to
12 carriers at once.



One-button channel
power measures up to
100 MHz bandwidth
with ± 0.3 dB absolute
amplitude accuracy.

One-button OBW
computes and displays the
bandwidth where a given
percentage of the total
power is contained.



PowerSuite

One-button power measurements for:

- Adjacent channel power (ACP)
- Channel power
- Occupied bandwidth (OBW)
- Spectrum emission mask
- Complementary cumulative distribution function (CCDF)
- Burst power
- Spurious emissions

Measurement-Specific Software Applications

Available today:

- N9075A 802.16
- N9073A-1FP W-CDMA
- N9073A-2FP HSDPA/HSUPA
- N9068A Phase noise

More available in 2007!

Ideal for manufacturing, practical for R&D

MXA measurement specific software applications provides application-specific and standards-based measurements with one-button simplicity and SCPI programmability.



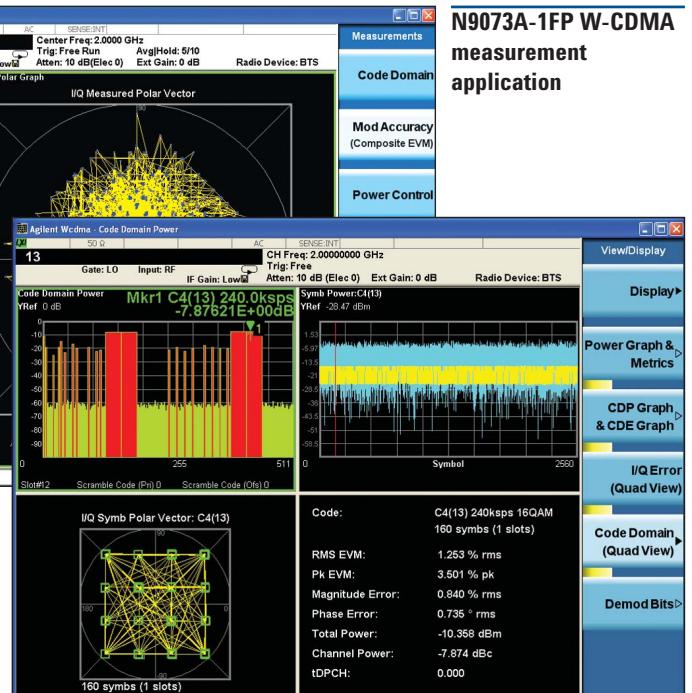
N9075A 802.16 OFDMA (WiMAX) measurement application

Easily make one-button pass/fail standards-based measurements for mobile WiMAX development and manufacturing.



N9068A phase noise measurement application

Quickly analyze phase noise in frequency domain (log plot) and time domain (spot frequency). (Orderable December 2006)



N9073A-1FP W-CDMA measurement application

Make fast W-CDMA/HSDPA/HSUPA measurements without compromising dynamic range.

Complex Signal Analysis and Troubleshooting

Ideal for development with 89601A vector signal analysis software running inside the MXA

Seamless capture and complex signal analysis of up to 25 MHz signals over a 26.5 GHz frequency range

The MXA signal analyzer, with the optional 25 MHz bandwidth and the 26.5 GHz frequency option, provides enough bandwidth to measure WiMAX signals and a high enough frequency range to measure harmonics. Analyze complex, time-varying signals using the advanced modulation analysis algorithms within the highly flexible 89601A VSA software to help you develop, troubleshoot and verify the physical layer performance of your radio system. Easily navigate the 89601A VSA user interface using a keyboard and mouse.

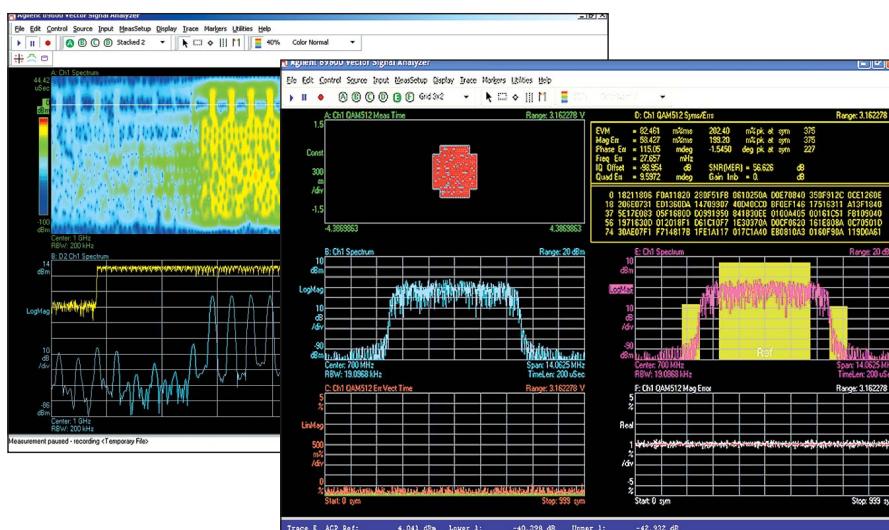
Explore the software

A 14-day trial version of the 89601A VSA software is included in every MXA signal analyzer. Evaluate the software free and access the in-depth help file to learn more about the software.

Features

- Adaptive equalization – identify and remove linear errors from I/Q modulated signals by dynamically creating and applying a compensating filter
- Six-grid enlargable arbitrary displays – advanced display of measurement results
- Arbitrary span and sample rate selection – customize measurements for specific needs
- Signal recording – record signals for post processing, archiving, and exporting to modeling tools such as MATLAB
- Trigging – trigger on any signal in the IF bandwidth or to an external trigger to start measurements based on a specific incident
- User definable math functions – quickly and easily manipulate data
- Spectrogram display – view the spectral behavior of wide bandwidth hopping signals over time using spectrogram displays

Track the frequency and amplitude behavior of signal using this three-dimensional spectrogram display.



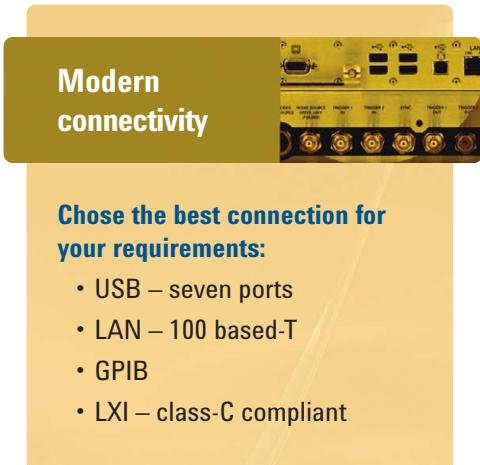
Examine up to six displays simultaneously, including constellation and vector, EVM spectrum and time, and many more.

Advanced modulation and parametric signal analysis capability

- 2G, 3G, 3.5G
- UWB, WiMAX (fixed/mobile), WLAN, digital video, Private Mobile Radio, CDMA (base and mobile), CDPD, GSM, EDGE, NADC, PDC, PHP (PHS), W-CDMA, TD-SCDMA, HSDPA, 1xEV-DO, 1xEV-DV
- *Bluetooth*, IEEE 802.11a/b/g/j/p, ZigBee
- APCO 25, DECT, TETRA 1, TETRA 2 (TEDS), VDL mode 3
- FSK: 2, 4, 8, 16 level (including GFSK), MSK (including GMSK), BPSK, QPSK, OQPSK, DQPSK, D8PSK, p/4-DQPSK, 8PSK, 3p/8-8PSK, 16/32/64/256/512/1024 QAM, 16APSK, 32APSK, 8VSB and 16VSB

www.agilent.com/find/VSAinMXA

Modern Connectivity



Take advantage of the modern connectivity in the MXA

- Connect your MXA to a LAN and control the MXA remotely; view signals, acquire and analyze waveform data from anywhere in the world using either the embedded web server or Windows Remote Desktop software.
- Connect the MXA to the LAN to share files and print to networked computers.
- Use IVI-Com drivers for Agilent VEE.
- Save time by reusing test code with the MXA's backward code compatibility to the ESA and PSA.



Focus on what matters most

At Agilent we know that it is your product that is most important, not creating a test system. To make system development more efficient and cost-effective, we offer Agilent Open, a versatile combination of test-system hardware, I/O and software tools to accelerate the creation of robust test systems that are easy to enhance and maintain. The MXA signal analyzer, an Agilent Open product, ensures greater choice in measurements, connectivity and programming. With the MXA's Agilent Open advantages, your team has more time to focus on what matters most – the performance and reliability of your product.

www.agilent.com/find/open

The one-stop resource for your connectivity needs

The MXA uses an open Windows XP Professional operating system. Visit the Agilent Developer Network (ADN), a repository of information and services for T&M engineers connecting instruments to computers that use Microsoft Windows-based applications and application development environments.

adn.tm.agilent.com



LXI class-C compliant

LXI (LAN eXtensions for Instruments), the test-system architecture based on proven, widely used standards such as Ethernet, enables fast, efficient and cost-effective creation – and reconfiguration – of test systems. The MXA is an LXI class-C compliant signal analyzer that can help you and your team open new possibilities in testing.

www.agilent.com/find/lxi



Control the LXI class-C compliant MXA remotely over LAN using the embedded web server.

MXA Ordering Information

Description	Ordering no.	Upgradeable
Instrument		
MXA signal analyzer N9020A (includes spectrum analyzer measurement application)		
Frequency range, 20 Hz to 3.6 GHz	N9020A-503	No
Frequency range, 20 Hz to 8.4 GHz	N9020A-508	No
Frequency range, 20 Hz to 13.6 GHz	N9020A-513	No
Frequency range, 20 Hz to 26.5 GHz	N9020A-526	No
Portable configuration	N9020A-PRC	Yes
Performance options		
Precision frequency reference	N9020A-PFR	Yes
Electronic attenuator, 3.6 GHz	N9020A-EA3	Yes
Analysis bandwidth, 25 MHz	N9020A-B25	Yes
Preamplifier, 3.6 GHz	N9020A-P03	Yes
Preamplifier, 8.4 GHz	N9020A-P08	Yes
Preamplifier, 13.6 GHz	N9020A-P13	Yes
Preamplifier, 26.5 GHz	N9020A-P26	Yes
Software		
WiMAX 802.16-OFDMA measurement application	N9075A	Yes
W-CDMA measurement application	N9073A-1FP	Yes
HSDPA/HSUPA measurement application	N9073A-2FP (requires 1FP)	Yes
Phase Noise measurement application	N9068A	Yes
89601A vector signal analysis (VSA) software	89601A	Yes
Accessories		
USB flash drive, 512 MB	N9020A-EFM	Yes
USB DVD-ROM/CD-R/RW drive	N9020A-DVR	Yes
Mouse, USB interface	N9020A-MSE	Yes
Keyboard, USB interface	N9020A-KYB	Yes
Minimum loss pad, 50 to 75 ohms (Type N to BNC)	N9020A-MLP	Yes
Front panel protective cover	N9020A-CVR	Yes
Hard transit case	N9020A-HTC	Yes
Rack mount kit with handles	N9020A-1CP	Yes
Front handle kit	N9020A-1CN	Yes
Rack mount kit	N9020A-1CM	Yes
Rack slide kit	N9020A-1CR	Yes

Other options and accessories are available; see the MXA configuration guide for details.

Easy to Upgrade

Configure the MXA to meet your needs today and upgrade it later as your needs change.

Fast upgrade process for performance options or software

1. Place order for the upgrade with Agilent and request to receive the software entitlement certificate through email.
2. Redeem the certificate through the web by following the instructions on the certificate. (Download software if the upgrade is a software application.)
3. Begin using the new capability.

MXA software updates

Measurement application software will be updated periodically to add new functionality and improve performance. Minor revisions are free. Major revisions will be available as "for pay" updates for new licenses to add enhanced functionality/capabilities. All MXA software revisions provided in the first year, including major revisions, will be at no charge.

89601A software updates

See the 89601A VSA software technical overview for VSA software update alternatives.

www.agilent.com/find/mxa_upgrades

MXA Accessories

Additional accessories provide more protection for your MXA signal analyzer in tough environments.

Ultra-durable wheeled carrying case offers maximum protection and portability. This transit case comes with retractable handle, edge casters, and bumpers. A custom cut polyethylene foam insert provides additional protection for your MXA signal analyzer.

Add a convenient pivoting carrying handle and rubber protective corner and end guards. This configuration is intended for applications requiring more rugged packaging, such as in the field. Front panel protective cover is included in both the standard and portable configurations.



N9020A-HTC MXA hard transit case



N9020A-PRC MXA portable configuration

Service and Support

The performance and flexibility of the MXA signal analyzer is only a small part of what is available from Agilent. In a constantly changing environment, Agilent's ability to understand your business needs and quickly provide the latest end-to-end service and support solutions gives the certainty and confidence necessary to accelerate the development and deployment of winning technologies.

Support solutions

Use Agilent's support solutions to get more from the MXA, as well as other test equipment, by increasing productivity and maximizing up-time. Our programs are designed with flexibility and can be tailored to meet your needs, including costs and response times.

Service and support

Repair services ensure that the instrument is up and running as quickly as possible. The MXA comes with a one-year return-to-Agilent warranty. Extended warranty and technical support options are available at the time of purchase.

Agilent calibration

Agilent calibration services are available worldwide to ensure MXA measurement confidence to its original factory shipped condition. Choose return-to-Agilent or on-site calibration services. Upfront calibration plans available at the time of purchase provide the best value.

Volume on-site calibration

(VOSCAL) service minimizes instrument downtime and associated costs by delivering quality calibration on-site without interfering with output schedules. VOSCAL is a fully operational, high-quality mobile calibration laboratory complete with high-specification systems and automation.

System up-time services

These services provide Agilent's global resources and expertise to help prevent system failures and develop solutions to problems fast. Our system up-time teams are comprised of our best service specialists to keep systems up and running. Equipment management services assist in managing test and measurement assets. Agilent's global equipment management solution helps maximize the utilization and reduce the ownership cost of test equipment.

For more information on Agilent support solutions visit:

www.agilent.com/find/tm_services

Literature Resources

Agilent MXA Signal Analyzer Data Sheet
Literature number: 5989-4942EN

Agilent MXA Signal Analyzer Configuration Guide
Literature number: 5989-4943EN

Agilent MXA Signal Analyzer Photo Card
Literature number: 5989-4940EN

89600 Series Vector Signal Analysis Software Technical Overview
Literature number: 5989-1679

Using the Agilent MXA Signal Analyzer for Measuring and Troubleshooting Digitally Modulated Signals Application Note
Literature number 5989-4944EN

Using MXA Preselector Tuning for Amplitude Accuracy in Microwave Spectrum Analysis Application Note
Literature number 5989-4946EN

Maximizing Measurement Speed with the Agilent MXA Signal Analyzer Application Note
Literature number 5989-4947EN

Web Resources

Visit our web for additional information and literature.

MXA signal analyzer

www.agilent.com/find/mxa

Upgrades

www.agilent.com/find/mxa_upgrades

Measurement application software

www.agilent.com/find/mxa_updates

Accessories

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Calibration

www.agilent.com/find/calibration

Renting, leasing or financing

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Remove all doubt

Keep your Agilent equipment performing like new. Have it calibrated and repaired by the company that made it. Only Agilent can ensure that your equipment maintains its highest levels of performance, with prompt turnaround time.

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

www.agilent.com/find/removealldoubt

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