

Greater Insight into **Wireless Connectivity**

Test Solutions for WiMAX™, RFID, NFC, WLAN, *Bluetooth*®, UWB, ZigBee



Agilent Technologies

Agilent Wireless Connectivity Test – Greater Insight. Greater Confidence.



Agilent Technologies, the world's premier measurement company, offers a full range of design and test solutions that span the range of wireless connectivity technologies—from RFID through to WLAN. Agilent products cover the lifecycle.

From design and development...

Agilent is an active participant in the development of test processes and measurement methods in many of the wireless connectivity standards. We are determined never to let test equipment needs stand in your way of developing innovative products for evolving wireless standards.

To integration and interoperability...

Agilent provides test equipment that can be used to help ensure your wireless products will conform to standards and interoperate with same-technology devices from multiple vendors. Agilent also provides tools and services to streamline the way you prepare for certification, helping you evaluate module performance, characterize interoperability, and make sure your integration effort results in certified products.

To manufacturing...

As technologies move into manufacturing, Agilent extends its expertise to offer stand-alone products and system solutions to help get your designs to market faster and more efficiently. And, we will continue refining our offering as technologies mature and cost-of-test issues drive manufacturing efficiency.

To installation and maintenance...

Field work continues to be demanding. Agilent's tools allow you to do more in the field in less time and increase your ability to detect and eliminate interference signals.

Worldwide engineering expertise

Our worldwide test engineering expertise and robust knowledge library of application notes, CDs and more are designed to help you interpret, clarify and test to continually evolving standards, giving you greater insight into your wireless connectivity designs. Agilent Wireless Connectivity Test – Greater insight. Greater confidence.



Wireless Connectivity presents Engineering Challenges



1 to 30 miles: Wireless Metropolitan Area Network (WMAN)

- ▶ Fixed WiMAX™
- ▶ Mobile WiMAX™



300 feet: Wireless Local Area Network (WLAN)

- ▶ WLAN 802.11ac
- ▶ WLAN IEEE 802.11a/b/g/h/j/p/n
- ▶ WiGig 802.11ad



30 feet: Wireless Personal Area Network (WPAN)

- ▶ WiMedia
- ▶ Bluetooth®
- ▶ NFC
- ▶ UWB
- ▶ ZigBee



WMAN- WiMAX Waves

Keeping abreast with a phased technology is never ending. WiMAX Wave 2 products include MIMO techniques; bringing a whole new complexity to antenna design and modulation schemes. In addition, your product must conform to 802.16 standards in order to be allowed to operate in defined geographic regions. These engineering challenges coexist with a pressure to bring certified high-quality, high-yield products to market quickly.



www.agilent.com/find/wimax

WLAN- Multiple WLAN versions including 802.11ac and 802.11ad

Multiple versions of the standard; 802.11a/b/g/h/j/p/n and the latest varieties 802.11ac and ad, add the challenges of backwards compatibility, embracing the latest standards, and cutting manufacturing costs with each new wave of standard development.

www.agilent.com/find/wlan

WPAN- Bluetooth, UWB, RFID, NFC, ZigBee

Additional enhancements to each of these technologies present a new learning curve and a new certification or compliance process. Improved functionality must not interfere with existing signals in close proximity. And package size demands tighter integration of the entire design including PHY requirements which are a new area of expertise for digital engineers.

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www.agilent.com/find/uwb
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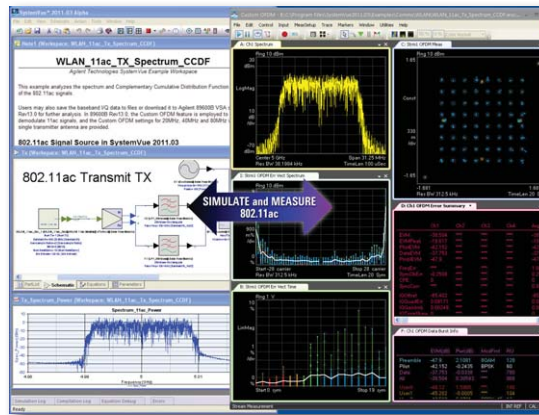
Design and Development



Whether you are designing components, or user equipment, only Agilent delivers a complete, integrated R&D design and test environment with simulation, characterization, and evaluation tools. Agilent's broad product portfolio makes it the only test equipment supplier able to provide a single-vendor solution for the cross-domain test challenge of digital wireless designs such as DigRF.

Baseband DSP and System Design

Agilent SystemVue integrates a new "communications design cockpit" for modeling baseband PHY algorithms in high-level languages such as MATLAB .m, C++ and VHDL. By integrating algorithms with standards-based reference libraries, RF and channel models, and stimulus-response test equipment, Agilent has created a new category of system-level design tools that verifies designs earlier and more consistently into test.



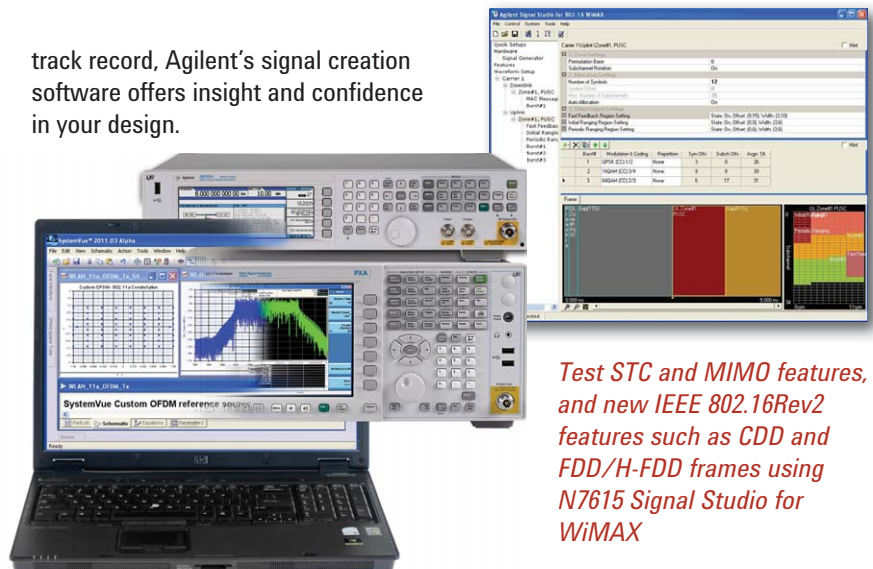
The W1917 WLAN personality for SystemVue also links to the 89600B VSA "Custom OFDM" measurement personality to provide early stimulus-response support for the emerging 802.11ac standard.

RF component design and development

Agilent offers leading-edge RF EDA tools for transceiver designers, including RFICs (GoldenGate), RF & microwave (Advanced Design System) and personal RF board design (Genesys). Use the same waveforms to verify RF designs in simulation.

Connect the Agilent PNA-X or ENA network analyzers and match real-world test results with simulation data for accelerated validation and pre-compliance. Agilent Signal Studio and embedded software is a suite of flexible, easy-to-use, signal creation software that will cut the time you spend on signal simulation. And, with a demonstrated first-to-market

track record, Agilent's signal creation software offers insight and confidence in your design.



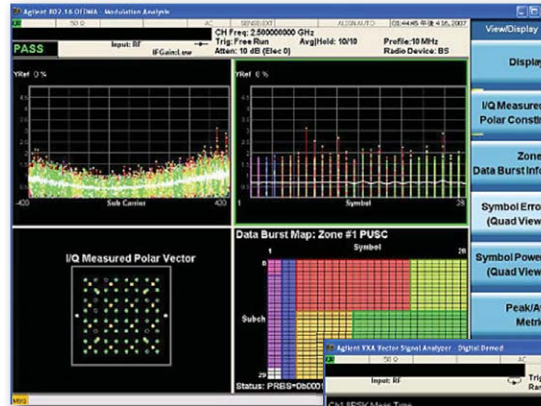
Test STC and MIMO features, and new IEEE 802.16Rev2 features such as CDD and FDD/H-FDD frames using N7615 Signal Studio for WiMAX

Design, validate and test seamlessly with RF EDA tools



Prototype evaluation

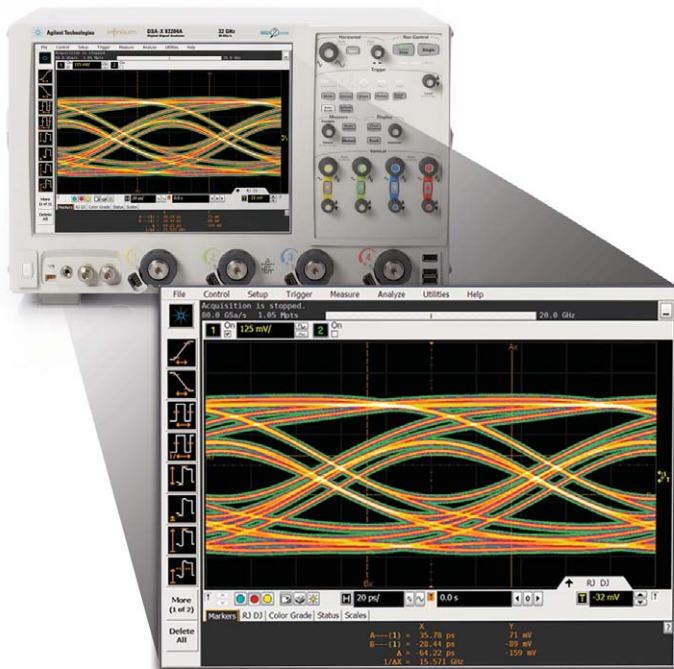
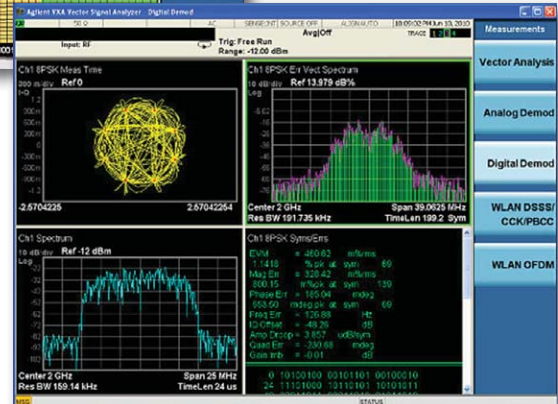
From standalone one-box test sets for early manual testing, to automated conformance test systems, Agilent has the right tools to help you fully evaluate your prototype and pre-production devices throughout your development cycle. X-Series signal analyzers have a library of more than 25 measurement applications including WLAN, WiMAX and Bluetooth.



Module design

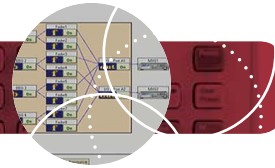
Combine the Agilent MXG signal generator, pattern generation, and logic analysis with the Agilent MXA and the Agilent 89600 Vector Signal Analysis software, for complete characterization of digital wireless designs. Agilent's innovations keep pace with technology development. Agilent 89600 VSA software supports newer technologies like 802.11ac. And the PXA Signal Analyzer espouses 160 MHz bandwidth required by some advanced technologies like 802.11ac.

The N9075A 802.16 OFDMA measurement application provides one-button standard-based pass/fail testing of IEEE 802.16-2005 compliant signals. And the N9064A application provides FFT-based spectrum analysis, time domain analysis, general purpose digital modulation analysis and advanced 802.11 a/b/g modulation analysis.



The 89600 Series VSA paired with a DSO90000 Series oscilloscope captures and entire 500 MHz UWB signal.

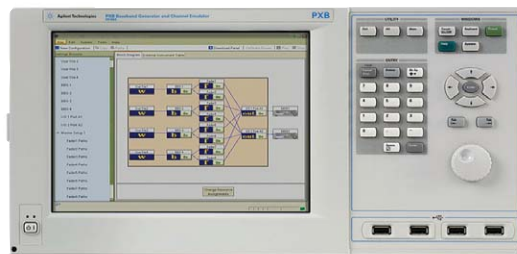
Integration and Interoperability



Where earlier technologies relied on conformance testing which focused on RF performance and ensuring a new device adhered to standards mainly aimed at providing voice call service, new data-centric technologies such as WiMAX and 802.11ac face a whole new testing paradigm. Device suppliers and mobile network operators must ensure end-users are delighted with the performance of their new gadget under all circumstances.

Integration

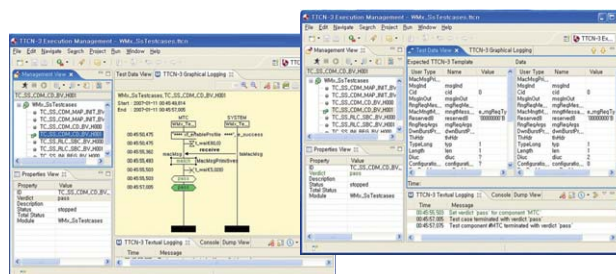
The Agilent N5106A PXB baseband generator and channel emulator offers multi-channel baseband generation, real-time fading, and signal capture in a single instrument.



For signal generation, the PXB has up to 4 built-in baseband generators allowing the creation of standard-compliant signals with support for up to 4x2 MIMO in one instrument.

Conformance

With Agilent's suite of WiMAX test solutions, built on proven platforms, you can approach interoperability and conformance testing with very high confidence. Agilent supports both Radio Conformance Test (RCT) through our partnership with AT4 Wireless and Protocol Conformance Test (PCT) with the Agilent N6430A based on the E6651A Mobile WiMAX Test Set.



E6651A flexible WiMAX base station emulation for subscriber station test provides network entry, traffic connection, data transfer and RF tests plus the ability to stress, test and debug protocol and data handling.

Manufacturing



In the manufacturing environment you feel intense time-to-market pressures, especially for new technologies where being first is key. From complete networks and hubs to end-user equipment with a lifetime of only a few months to make a return on investment, you need to get your product to market fast, while protecting your bottom line. Choose Agilent for a complete portfolio of test equipment solutions that are fast, accurate, flexible, and cost-effective.

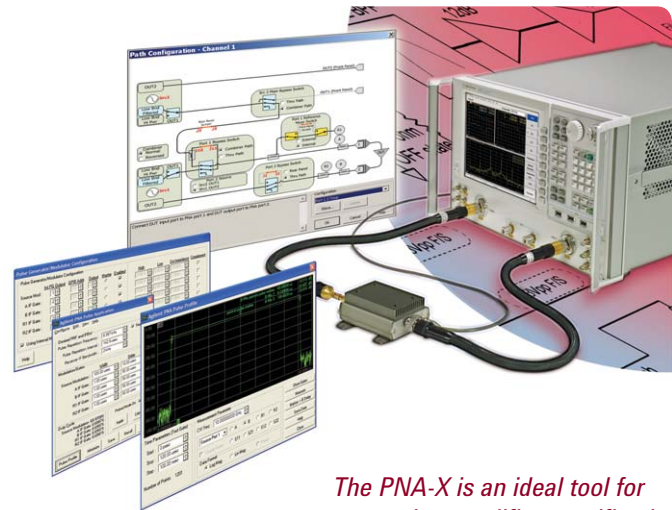
The N4010A offers an integrated vector signal generator (transmitter) and a wide bandwidth signal analyzer (receiver) in a single test component—replacing the need for separate spectrum analyzers, power meters, power sensors and golden radios.



N4019C wireless test manager software provides ready-to-use tests, test plans, test sequencing, and menu-selectable hardware support for quick and easy automation of Bluetooth and WLAN manufacturing.

Component test

Developing technical edge components brings many unexpected problems from various factors. Use Agilent network analyzers with multi-port test sets and calibration tools to minimize reconnection and obtain optimum measurement integrity. For complicated technical issues beyond linear component characterizations, Agilent PNA-X Series is the right solution. Solve the complicated non-linear technical issues in a single instrument with a single set of connections.

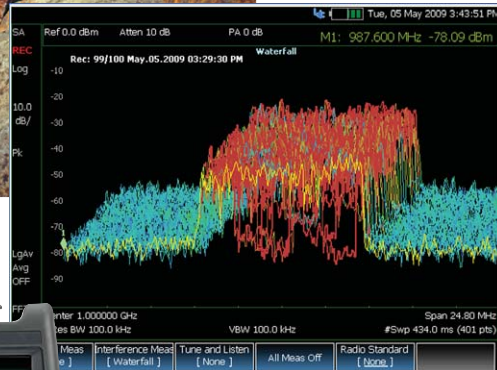


The PNA-X is an ideal tool for measuring amplifier specifications, from gain and return loss, to harmonics and IMD.

Installation and Maintenance

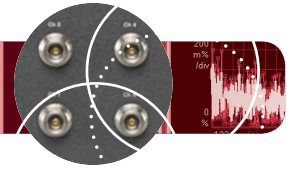


As operating frequencies have soared from sub-GHz levels up to 5.8 GHz, you have had to build more hubs or upgrade existing sites to maintain the same size coverage area. As a result, you need to deploy and maintain more sites and more complex and co-located networks than you previously did in the same amount of time. You need the right installation and maintenance tools that make you more productive.



With Agilent's range of FieldFox handheld test tools, you can do more in the field in less time – rapidly troubleshoot defective devices in cable/antenna systems, detect, identify and eliminate interference signals and easily test multiple technologies on multiple frequency bands.

MIMO

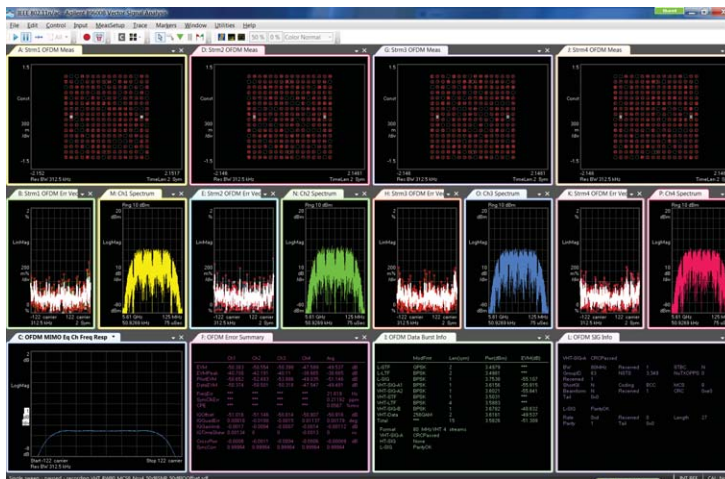


As more and more wireless connectivity technologies aim for higher data rates with better spectrum efficiency, Multi-Input Multi-Output (MIMO) is a key technique for wireless connectivity applications. Agilent provides a broad and powerful set of MIMO test solutions including N5106A PXB baseband generator and channel emulator, N7109A Multi-Channel Signal Analysis System, Dual MXAs (N9020A) and EXAs (N9010A), Infiniium oscilloscopes, MXG signal generator, SystemVue software and 89600B VSA software to make your MIMO test easier and faster with more accuracy and more cost effectiveness.

www.agilent.com/find/mimo



The N7109A is a modular, compact measurement platform. You can configure a system with one or two N7130A two-channel receiver modules that provide 40 MHz analysis bandwidth from 20 MHz to 6 GHz.



With the 89600B VSA software, the N7109A provides fast, wide spectral searches with high resolution, helping you detect small signals next to large ones and capture intermittent or short-duration signals.

Greater Insight-Web Sites Rich with Resources




Get a jump start on learning new technologies by investigating Agilent's wireless connectivity web sites. Here you will find white papers, application notes, eSeminars and other valuable resources to help you research, identify and implement the best test solutions to meet your specific project needs.



EVOLVING WIRELESS STANDARDS
AGILENT WIRELESS — GREATER INSIGHT. GREATER CONFIDENCE.

Standard	Global Communication				New Key Technical Data				Wireless Community				Mobile Video Production			
	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G	17G	18G
3GPP R10																
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The Right Tools for the Right Technology



Agilent products cover the intricacies of design, integration, interoperability, manufacturing and installation. Reliable hardware and personalized software cover the spectrum of Wireless Connectivity Technologies-WiMAX, WLAN (and its many renditions), RFID, NFC, *Bluetooth*, UWB and Zigbee.



Design and Simulation, Logic Analyzers, Network Analyzers, Oscilloscopes, Power Meters and Sensors, Power Supplies and Sources, Signal Analysis, Signal Generation, Test Sets, Specialty Test

Agilent Wireless Connectivity Test- Greater Insight. Greater Confidence.





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