

Keysight Technologies

Spectrum Analyzer and Signal Analyzer



Selection Guide

Introduction

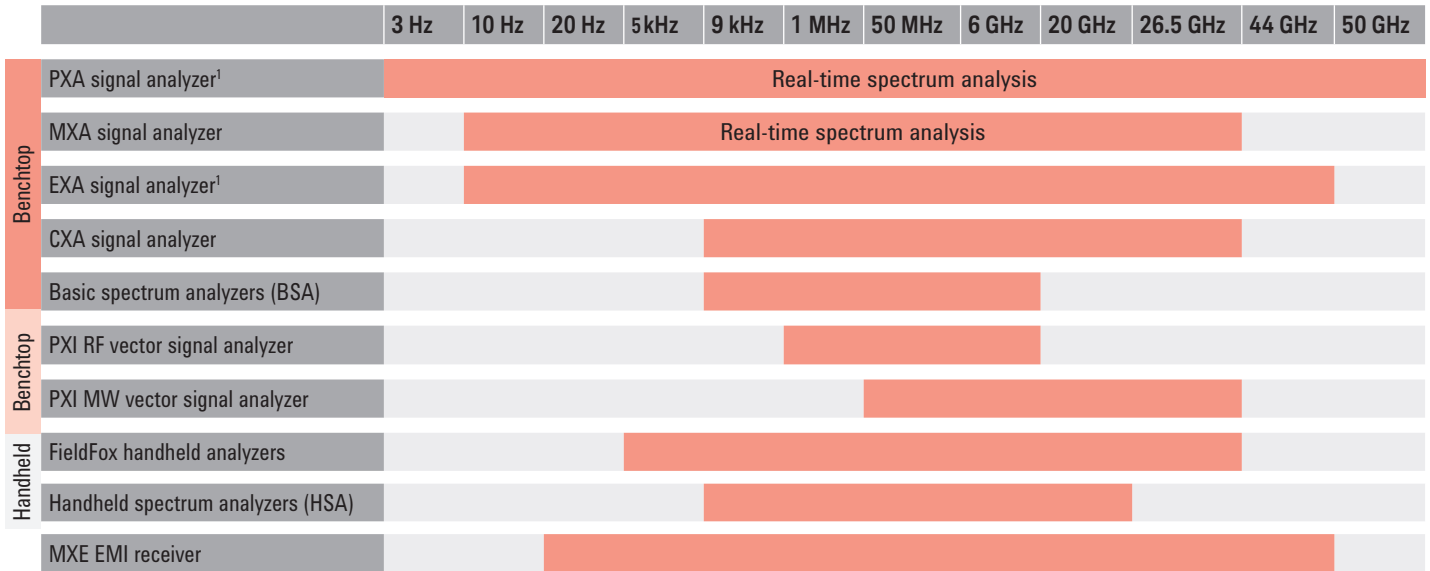
The Keysight Technologies Inc. extensive array of signal analyzer products, from DC to 325 GHz and beyond, address whatever application you may be working on.

Proven measurement science and expertise are incorporated into all of our signal analyzers and measurement software, ensuring accurate frequency, amplitude, and modulation measurements, including distortion, spurious, phase noise, and 2G to 4G wireless communications signals. And because many of Keysight's benchtop and modular instruments share a common set of software applications, you can be assured of consistent results whether your goal is faster design in R&D or high volume production in manufacturing.

Additionally, for applications that require greater mobility, handheld products offer the ability to take precision out into the field.

A signal or spectrum analysis instrument purchase is an investment that must meet not only today's challenges but also tomorrow's requirements, however selecting the ideal instrument for your business can be complex and time consuming. This selection guide is designed to help you identify the right spectrum or signal analyzer and software to fit your budget, application, and specific measurement needs.

Frequency coverage for Keysight spectrum and signal analyzers



1. Up to 1.1 THz with external mixing

Product Categories

Spectrum analyzers and signal analyzers

Traditionally, spectrum analyzers are referred to as swept-tuned, super-heterodyne receivers that provide a display of amplitude versus frequency. Modern day analyzers offer both swept-tuned and FFT architectures. While the terms spectrum analyzer and signal analyzer are used interchangeably, signal analyzer is a more accurate term for modern day analyzers that provide more comprehensive signal analysis, not only in frequency-domain but also time- and modulation-domains.

Benchtop

Benchtop spectrum and signal analyzers are well-suited for R&D or design verification where analysis and troubleshooting benefit from interactive analysis. Keysight's benchtop analyzers range from low cost to industry-leading performance with the broadest range of measurement capabilities so you can choose the analyzer that best suits your needs.

Modular PXI vector signal analyzers

Modular signal analyzers are ideal for applications that require fast, high quality measurements, such as high-volume manufacturing, where quality control, product conformance and test optimization are essential. Modular solutions offer speed, scalability and repeatability, along with the flexibility to configure a solution with a shared processor, frame/chassis, display, and interface. Benefit from Keysight's measurement expertise, software, and PXI integration to create an application-focused modular solution, including multi-channel or multi-measurement capability.

Handheld analyzers

Whether you're looking for value or precision, RF or microwave, we offer rugged, accurate, fast, and easy-to-use handheld spectrum analyzers to address challenges faced by field technicians and engineers. Handheld analyzers are optimized for long battery life and minimal weight.

Applications and measurement software

Available for a broad range of communication standards and modulation types, Keysight offers PC- and instrument-based applications and software to address measurement needs from in-depth troubleshooting, to standard-compliant design validation, to high-speed pass/fail testing.

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Key Specifications Comparison

Specifications	Benchtop					Modular		Handheld	
	PXA	MXA	EXA	CXA	BSA	PXI RF VSA	PXI μ W VSA	FieldFox	HSA
	N9030A	N9020A	N9010A	N9000A	N9320B, N9322C	M9391A	M9392A	N993xA N991xA-233	N934xB/C
Performance	★★★★★	★★★★	★★★	★★	★	★★★★	★★★★★	★★★	★★
Frequency range, min-max	3 Hz to 50 GHz	10 Hz to 26.5 GHz	10 Hz to 44 GHz	9 kHz to 26.5 GHz	9 kHz to 7 GHz	1 MHz to 6 GHz	9 kHz to 27 GHz	5 kHz to 26.5 GHz	9 kHz to 20 GHz
Analysis bandwidth									
Standard RF	10 MHz	25 MHz	25 MHz	10 MHz	1 MHz	40 MHz	40 MHz	25 MHz	2 MHz
Optional RF	25, 40, 85, 160 MHz	40, 85, 125, 160 MHz	40 MHz	25 MHz		100 MHz 160 MHz	100 MHz 160 MHz		
Optional baseband	25, 40 MHz	25, 40 MHz							
Overall amplitude accuracy (95%)	± 0.19 dB	± 0.23 dB	± 0.27 dB	± 0.50 dB	± 0.50 dB, ± 0.60 dB	± 0.45 dB	± 0.25 dB	± 0.5 dB	± 1.50 dB
Dynamic range, max third order at 1 GHz	119 dB	116 dB	112 dB 116 dB ¹	111 dB	76 dB, 83 dB	–	120 dB	113 dB	96 dB
Displayed average noise level (DANL) @ 1 GHz	–172 dBm	–166 dBm	–163 dBm –165 dBm ¹	–163 dBm	–145 dBm, –152 dBm	–161 dBm	–168 dBm	–154 dBm	–155 dBm
@ 4 GHz	–172 dBm	–166 dBm	–162 dBm	–159 dBm –161 dBm ²	–	–166 dBm	–166 dBm	–154 dBm	–150 dBm
Third order intercept (TOI) @ 1 GHz	22 dBm	20 dBm	18 dBm 19 dBm ¹	17 dBm 15 dBm ²	13 dBm, 15 dBm	18 dBm	31 dBm	15 dBm	11 dBm
Phase noise @ 1 GHz									
10 kHz offset	–132 dBc/Hz	–114 dBc/Hz	–105 dBc/Hz –106 dBc/Hz ¹	–110 dBc/Hz	–90 dBc/Hz,	–119 dBc/Hz	–110 dBc/Hz	–111 dBc/Hz	–89 dBc/Hz (30 kHz offset)
1 MHz offset	–146 dBc/Hz	–136 dBc/Hz	–137 dBc/Hz	–130 dBc/Hz ¹	–112 dBc/Hz, –121 dBc/Hz	–134 dBc/Hz	–134 dBc/Hz	–113 dBc/Hz	–119 dBc/Hz
Standard attenuator range/step	70 dB/2 dB	70 dB/2 dB	60 dB/10 dB	50 dB/10 dB 70 dB/10 dB ²	70 dB/1 dB, 50 dB/1 dB	70 dB/1 dB	42 dB/ 0.25 dB	30 dB/5 dB	50 dB/1 dB
Resolution bandwidth	1 Hz to 8 MHz	1 Hz to 8 MHz	1 Hz to 8 MHz	1 Hz to 8 MHz	10 Hz to 1 MHz	–	1 Hz to 31.25 MHz	1 Hz to 5 MHz	10 Hz to 3 MHz
Battery								●	●

1. For N9010A Option 532 or 544

2. For N9000A Option 513 or 526

Capability Comparison

Measurements/applications	Benchtop					Modular		Handheld		
	PXA	MXA	EXA	CXA	BSA	PXI RF VSA	PXI MW VSA	FieldFox	HSA	89600 VSA software
General purpose										
AM/FM tune and listen	•	•	•	•	•			•	•	
Analog demodulation	•	•	•	•	•	•	•		•	•
EMI precompliance	•	•	•	•						
Enhanced display package (spectrogram plus)	•	•	•	•	•			•	•	•
Stimulus/response measurement	•	•	•	•	•	•	•	•	•	•
Flexible digital modulation analysis	•	•	•	•	•	•	•		•	•
MATLAB	•	•	•	•		•	•			
Noise figure	•	•	•	•						
Phase noise	•	•	•	•						
Pulse	•	•	•	•				•		
Real-time spectrum analysis	•	•								
Remote language compatibility for 856xE/EC and 8566/68	•	•	•							
SCPI language compatibility	•	•	•	•	•	•	•	•	•	•
Cellular communications										
1xEV-DO	•	•	•	•		•	•			•
cdma2000®/cdmaOne	•	•	•	•		•	•			•
GSM/EDGE/EVO	•	•	•	•		•	•			•
iDEN/WiDEN/MotoTalk	•	•	•							
LTE FDD and TDD	•	•	•	•		•	•			•
LTE-Advanced FDD and TDD	•	•	•			•	•			•
Multi-standard radio (MSR)	•	•	•	•						•
TD-SCDMA/HSPA	•	•	•	•		•	•			•
W-CDMA/HSPA+	•	•	•	•		•	•			•
Wireless connectivity										
Bluetooth®	• ¹	• ¹	• ¹	• ¹		• ¹	• ¹			•
Fixed WiMAX™		•	•			•	•			•
Mobile WiMAX	•	•	•	•						•
WLAN 802.11a/b/g/n/ac	•	•	•	•		•	•			•
ZigBee	• ¹	• ¹	• ¹	• ¹		• ¹	• ¹			•
Digital video										
CMMB	•	•	•	•						
Digital cable TV	•	•	•	•						
DTMB (CTTB)	•	•	•	•						
DVB-T/H/T2	•	•	•	•						•
ISDB-T/T _{SB} /T _{mm}	•	•	•	•						•
PowerSuite one-button measurements										
Channel power	•	•	•	•	•			•	•	
Occupied bandwidth	•	•	•	•	•			•	•	
Multicarrier, multi-offset ACP	•	•	•	•	•			•	•	
Multicarrier power	•	•	•	•						
CCDF	•	•	•	•						
Harmonic distortion	•	•	•	•						
Burst power	•	•	•	•						
Intermodulation (TOI)	•	•	•	•	•					
Spurious emissions	•	•	•	•						
Spectrum emission mask	•	•	•	•	•			•	•	

1. VXA vector signal analysis measurement application provides digital demodulation with standard presets

Benchtop

X-Series Signal Analysis

We can't predict the future, but Keysight can help you shape it with our future-ready test assets. The X-Series is an evolutionary approach to signal analysis that spans instrumentation, measurements, and software. It gives you the flexibility to satisfy your business and technical requirements across multiple products and programs --now and in the future. The X-Series creates a consistent framework that enables your teams to move at a faster pace. Stay ready, stay in sync, and arrive ahead with the Keysight X-Series.

Future-ready instruments

X-Series signal analyzers are ready to evolve as technology changes. With X-Series instruments, you can move along the performance curve today and tomorrow without rewriting your test code, while optimizing price and performance for whichever technologies you're pursuing. With upgradeable hardware and license-key upgrades for adding functionality or measurement applications, you can keep your test assets current and extend instrument longevity. Take advantage of:

- Upgradeable CPU, memory, solid state drives, I/O ports
- Performance enhancements with Windows 7
- Optional real-time spectrum analysis and bandwidth
- New standard features, including fast sweep (depending on hardware configuration) and enhanced phase noise and third-order intercept (TOI)

Consistent measurement framework

Proven algorithms, 100% code-compatibility, and a common UI across the X-Series create a consistent measurement framework for signal analysis that ensures repeatable results and measurement integrity through all phases of product development. A common, familiar user-interface means increased efficiency and productivity --when you learn how to use one X-Series analyzer, you know how to use them all.

Software and applications

Save time and money with a shared library of applications to measure your signals, whether you're engaged in cellular, wireless connectivity, MILCOM, SATCOM, or general purpose testing. Each application can be easily upgraded as new features and technologies are introduced. With the open WindowsR OS you can run software such as MATLAB or 89600 VSA. See pages 13 and 14.



CXA

Master the essentials

EXA

Balance the challenges

MXA

Accelerate in wireless

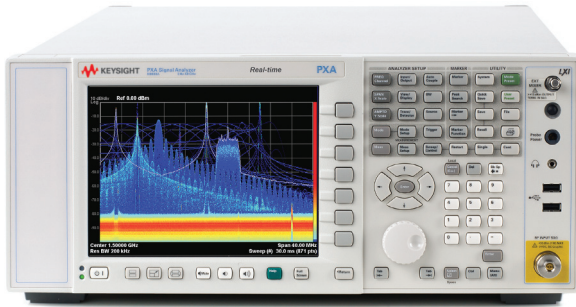
PXA

Drive your evolution

Performance, functionality, price

Benchtop (continued)

X-Series Signal Analyzers

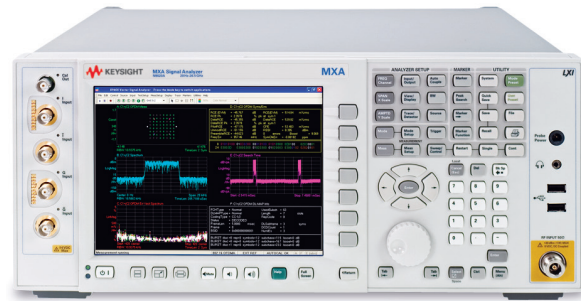


PXA
N9030A

The high-performance PXA signal analyzer is the evolutionary replacement for other performance signal analyzers. Advanced performance, flexibility and expandability enable users to meet demanding applications in aerospace, defense, commercial communications, and more. Remote language compatibility features make it easy to replace existing spectrum analyzers. Adding real-time spectrum analysis (RTSA) capability to new or existing PXAs lets you see, capture and understand the most elusive signals.

- Keysight's exclusive noise floor extension (NFE) technology delivers -172 dBm effective noise floor
- Excellent phase noise performance (-132 dBc/Hz at 10 kHz offset) and third-order intercept (up to $+23$ dBm)
- Analyze the most complex signals with 160 MHz analysis bandwidth and upgradable RTSA capability

www.keysight.com/find/PXA



MXA
N9020A

The midrange MXA is the optimum choice as you develop new wireless devices and deliver them to manufacturing and the marketplace. It has the flexibility to quickly adapt to your evolving test requirements, today and tomorrow. Address multiple formats, generations and devices with the MXA --and accelerate in wireless. The MXA's enhanced phase noise, optional wide bandwidth, real-time, and fast sweep capability make the MXA highly versatile.

- Best-in-class phase noise performance (-114 dBc/Hz at 10 kHz offset)
- Optional 85, 125, or 160 MHz analysis bandwidth to analyze complex signals within your budget
- Upgradable RTSA capability to capture elusive signals

www.keysight.com/find/MXA

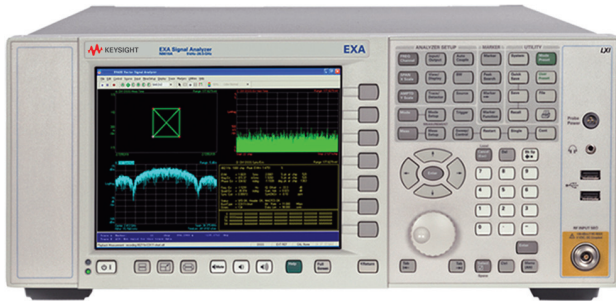
Key specifications	PXA	MXA	EXA	CXA
Frequency range	3 Hz to 50 GHz	10 Hz to 26.5 GHz	10 Hz to 44 GHz	9 kHz to 26.5 GHz
Phase noise, 1 GHz (10 kHz offset)	-132 dBc/Hz	-114 dBc/Hz	-105 dBc/Hz -106 dBc/Hz ¹	-102 dBc/Hz -110 dBc/Hz
Maximum third order dynamic range, 1 GHz	119 dB	116 dB	112 dB 116 dB ¹	111 dB
Displayed average noise level, 1 GHz	-172 dBm	-166 dBm	-163 dBm -165 dBm ¹	-163 dBm
Standard attenuator range/step	70 dB/2 dB	70 dB/2 dB	60 dB/10 dB	50 dB/10 dB 70 dB/10 dB ²
Overall amplitude accuracy	± 0.19 dB	± 0.23 dB	± 0.27 dB	± 0.50 dB

1. For N9010A Option 532 or 544

2. For N9000A Option 513 or 526

Benchtop (continued)

X-Series Signal Analyzers (continued)

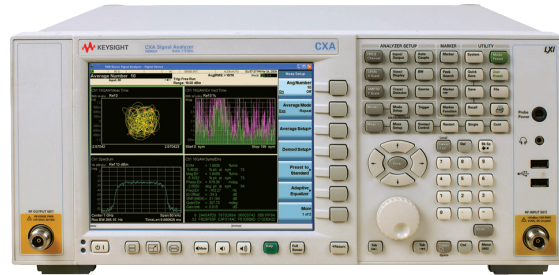


EXA
N9010A

From RF to millimeter wave, whether you're pushing to enhance a product or improve test throughput, your general-purpose signal analyzer should be ready for a wide range of challenges. That's what drives the Keysight EXA signal analyzer—the fast, flexible way to cover diverse needs with a single tool. With the most recent enhancements in phase noise, dynamic range, and sweep speed, the EXA provides a solid mix of speed and performance, and offers the versatility of X-Series measurement applications.

- Widest frequency coverage in its class - 10 Hz to 44 GHz and beyond
- Fast sweep and fast power measurement maximize and enhance yield
- Up to 40 MHz analysis bandwidth

www.keysight.com/find/EXA



CXA
N9000A

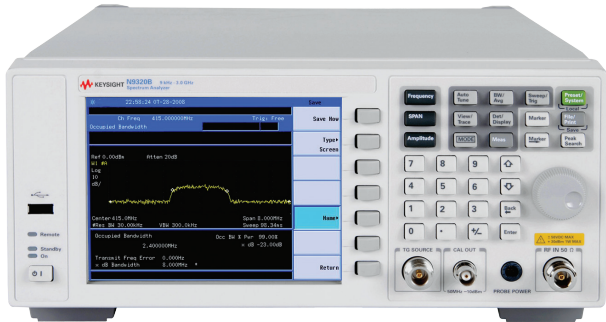
A great low-cost signal analyzer surpasses the basics and delivers crucial functionality. That's the strength of the CXA signal analyzer, the leading low-cost tool for essential signal characterization up to 26.5 GHz. Its capabilities provide a foundation for cost-effective testing and seamless integration with the other X-Series models. The CXA is also an excellent teaching tool for RF and microwave technologies and signal analysis.

- Reduce costs and improve throughput in manufacturing test
- Built-in tracking generator for component characterization
- Up to 25 MHz analysis bandwidth
- Additional 75-ohm RF input connector for cable TV measurement

www.keysight.com/find/CXA

Benchtop (continued)

Basic Spectrum Analyzers (BSA)



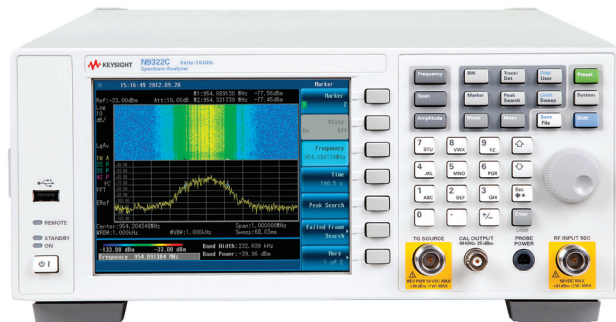
BSA
N9320B

Whatever type of consumer or general-purpose RF electronic devices or components you are manufacturing, spectrum analysis provides essential information on their performance, characteristics, and interaction. And in today's competitive world, you need this analysis to be dependable and affordable.

The N9320B spectrum analyzer is ideal for consumer electronics manufacturing, and bench repair. It provides:

- Fast sweep speed in narrow resolution bandwidths
- Rugged body, large display, and 3U height
- AM/FM tune and listen
- AM/FM, ASK/FSK demodulation analysis
- Tracking generator: 100 kHz to 3 GHz

www.keysight.com/find/n9320b



BSA
N9322C

Given the dynamic nature of RF devices, using the N9322C spectrum analyzer that can evolve with your needs is simply prudent. Beyond its feature rich standard base, the N9322C supports an array of value-added capabilities that can be added when needed.

- Time gated sweep
- Tracking generator with built-in VSWR bridge
- Power meter mode, supporting Keysight U2000 Series/U2020 X-Series USB power sensors
- AM/FM, and ASK/FSK signal analysis
- Signal monitoring with spectrogram recording and playback
- Channel scanner for simultaneous channel power measurement of up to 20 channels
- AM/FM IBOC and xDSL measurements with enhanced DANL and phase noise performance

www.keysight.com/find/n9322c

Key specifications	N9320B	N9322C
Frequency range	9 kHz to 3 GHz	9 kHz to 7 GHz
Phase noise at 1 GHz, 10 kHz offset	-90 dBc/Hz	-90 dBc/Hz
Maximum third order dynamic range, 1 GHz	76 dB	83 dB
Displayed average noise level, 1 GHz	-145 dBm	-152 dBm
Standard attenuator range/step	70 dB, in 1 dB steps	50 dB, in 1 dB steps
Overall amplitude accuracy	± 0.5 dB	± 0.6 dB

Modular PXI Vector Signal Analyzers



PXIe RF vector signal analyzer M9391A

The M9391A PXIe vector signal analyzer provides fast, high quality measurements optimized for design validation and manufacturing test environments. It can be easily combined with additional PXIe VSAs to create a multi-channel signal analyzer, as well as the M9381A PXIe vector signal generator. Use it with the same portfolio of world-class software used for bench top instruments, including the X-Series measurement applications, 89600 VSA, SystemVue and Signal Studio software to get consistent measurement results you can trust.

- Analysis bandwidth up to 160 MHz
- Reduce test time from 3 s to < 300 ms with unique embedded power measurement mode and faster power servos convergence with outstanding linearity
- Rapid frequency and amplitude switching with fast tune baseband adjustments up to 15 μ s, nominal
- Real-time hardware resampling pinpoints answers faster with extremely fast modulation analysis
- Repeatability of < 0.05 dB, nominal
- Compact multi-channel VSA configurations; A 4-channel VSA occupies 13 slots in one 18-slot chassis
- EVM with 4-channel configuration
 - WLAN 802.11ac: –46 dB (5.8 GHz, 80 MHz BW)
 - LTE-FDD: –50.1 dB (0.9 GHz, 10 MHz BW)

www.keysight.com/find/M9391A



PXI MW vector signal analyzer M9392A

The M9392A PXIe performance vector signal analyzer delivers fast, accurate measurements from 9 kHz to 27 GHz for design validation and manufacturing of transmitters and components for aerospace, defense and commercial wireless applications. Combine with 89600 VSA software and X-Series measurement applications for enhanced signal analysis and standards-based test.

- Analysis bandwidth up to 160 MHz
- Fast frequency tuning in less than 150 μ s within 1 kHz and 0.1 dB
- Quickly characterize spurs and harmonics across 27 GHz in less than 1 second at 10 kHz resolution bandwidth with hardware and software optimized for speed
- High-speed embedded hardware accelerated power, spectrum, and IQ measurements
- Accelerate test with low latency, high throughput PXIe architecture

www.keysight.com/find/M9392A

Key specifications	M9391A	M9393A
Frequency range	1 MHz to 6 GHz	9 kHz to 27 GHz
Phase noise, 1 GHz (10 kHz offset), nominal	–119 dBc/Hz	–110 dBc/Hz
Maximum third order dynamic range, 1 GHz	18 dBm	31 dBm
Displayed average noise level, 1 GHz, nominal	–161 dBm	–168 dBm
Standard attenuator range/step	70 dB/1 dB	42 dB/0.25 dB
Overall amplitude accuracy, typical	\pm 0.45 dB	\pm 0.25 dB
Chassis slot compatibility	PXIe, PXI Hybrid	PXIe, PXI Hybrid
Size	4-slot	5-slot

Handheld

FieldFox Handheld Analyzers



FieldFox spectrum and combination analyzers N9935/36/37/38A and N9913/14/15/16/17/18A

Measuring up and earning a spot in your kit is the driving idea behind Keysight's FieldFox portable analyzers, available in frequencies up to 26.5 GHz. Carry the precision of our microwave models: they deliver Keysight-quality measurements wherever you need to go. Boost your readiness with an RF unit: every operating mode is flexible enough to meet the needs of novices and experts alike. And count on the durability of handheld analyzers designed to withstand your toughest working conditions.

- Get precision measurements that agree with benchtop results
- Meets MIL-PRF-28800F Class 2 and MIL-STD-810G, Method 511.5, Procedure 1, operation in explosive environments (type tested)
- Meets IP53 dust and water ingress tests (type tested)
- Compact and lightweight (3.0 kg/6.6 lbs.)

www.keysight.com/find/FieldFox

FieldFox spectrum analyzers

FieldFox spectrum analyzers are optimized to excel in the dynamic spectral environment seen commonly in the field.

- Unprecedented amplitude accuracy of ± 0.5 dB with InstAlign - no warm up required
- Interference analysis and spectrogram
- Full-band tracking generator and preamplifier

FieldFox combination analyzers

For maximum functionality, FieldFox combination analyzers integrate the measurement capabilities needed in a single, compact instrument.

- Make measurements quickly with CalReady and QuickCal; no need for a cal kit
- Base is a cable and antenna analyzer; Option 233 adds spectrum analyzer capability
- Optional vector network analyzer capability for full two-port S-parameters

Key specifications	FieldFox spectrum analyzers N9935/36/37/38A with Opt 233	FieldFox combination analyzers N9913/14/15/16/17/18A
Frequency range (min. to max.)	5 kHz to 26.5 GHz	5 kHz to 26.5 GHz
Phase noise, 1 GHz (10 kHz offset)	-111 dBc/Hz	-111 dBc/Hz
Maximum third order dynamic range, 1 GHz	113 dB	113 dB
Displayed average noise level, 1 GHz	-154 dBm	-154 dBm
Standard attenuator range/step	30 dB/5 dB	30 dB/5 dB
Overall amplitude accuracy	± 0.5 dB	± 0.5 dB

Handheld (continued)

Handheld Spectrum Analyzers (HSA)



HSA

N9340B, N9342C, N9343C, N9344C

If you are making essential spectrum analyzer measurements in the field, the Keysight HSA family makes your job easier. Covering frequencies up to 20 GHz, the HSAs have the features you need for operating in tough field environments and the measurement performance gives you confidence the job's been done right. The Keysight HSA portable analyzers let you automate routine tasks to save time and ensure consistent results.

- Built-in tracking generator and cable and antenna tester ¹
- Spectrum monitor and interference analyzer
- Innovative task planner enables routine test automation ²
- Channel scanner ²
- High accuracy power measurement with Keysight U2000 Series USB power sensor
- Peak power and pulse profiling with Keysight U2020 X-series power sensors ²
- Built-in GPS receiver and GPS antenna ²
- AM/FM and ASK/FSK modulation analysis

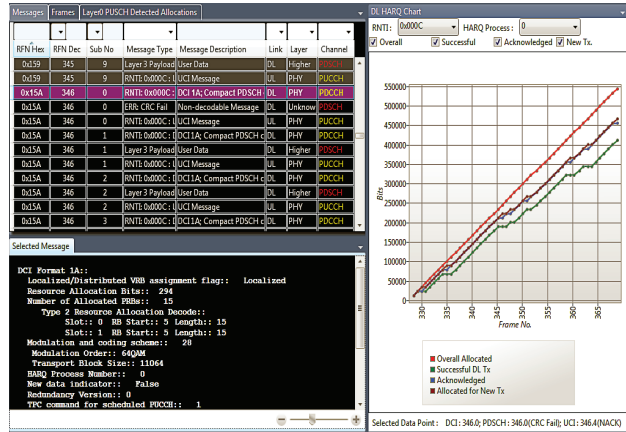
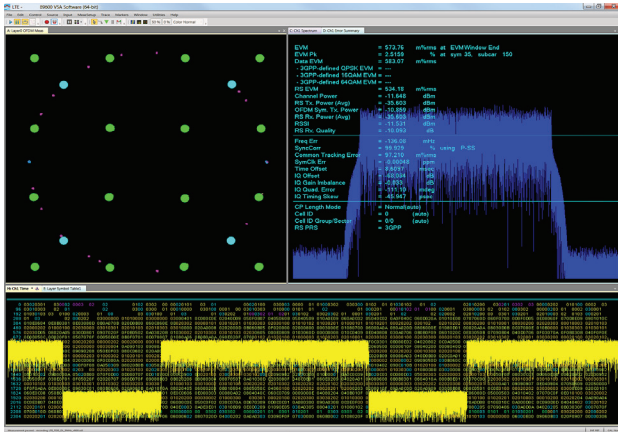
1. Cable and antenna tester is currently only available on N9342C.

2. Currently available only on N9342C/N9343C/N9344C.

Key specifications	N9340B	N9342C	N9343C	N9344C
Frequency range	9 kHz to 3 GHz	9 kHz to 7 GHz	9 kHz to 13.6 GHz	9 kHz to 20 GHz
Phase noise, 30 kHz offset	-87 dBc/Hz	-89 dBc/Hz	-89 dBc/Hz	-89 dBc/Hz
Maximum third order dynamic range, 1 GHz	89 dB	96 dB	95 dB	95 dB
Displayed average noise level, 1 GHz	-159 dBm	-162 dBm	-155 dBm	-155 dBm
Standard attenuator range/step	51 dB/1 dB	50 dB/1 dB	50 dB/5 dB	50 dB/5 dB
Overall amplitude accuracy	± 1.5 dB	± 1.5 dB	± 1.3 dB	± 1.3 dB

Applications and Measurement Software

89600 Software



89600 VSA software 89601B

The 89600 VSA software is a comprehensive set of tools for demodulation and vector signal analysis. These tools enable you to explore virtually every facet of a signal and optimize your most advanced designs. As you assess the tradeoffs, the 89600 VSA software helps you see through the complexity.

Measure your signal: supports more than 75 signal types

- AM, FM, PM, BPSK, QPSK, QAM, FSK, VSB, SOQPSK, APCO 25, custom APSK and OFDM
- LTE and LTE-Advanced FDD/TDD, W-CDMA/HSPA+, GSM/EDGE Evo, cmda2000, TD-SCDMA
- 802.11a/b/g/n/ac, WiMAX, Bluetooth, Zigbee, RFID, Wi-SUN

Explore virtually every facet of today's most complex signals

- Verify signal performance quickly with multiple simultaneous views in time, frequency and modulation domains
- Pinpoint the answers to signal problems with advanced troubleshooting tools including trace-to-trace marker coupling, record/playback, and multi-measurements
- Produce consistent, comparable results at the simulation, prototype and design-validation stages
- Choose the right front-end for your application: the 89600 VSA software supports more than 40 Keysight measurement platforms

www.keysight.com/find/89600

89600 WLA software 89620B

Deepen your understanding of link behavior with Keysight's 89600 WLA software, the MAC-layer complement to the 89600 VSA. Wireless-link analysis decodes control messages and correlates them with the PHY-layer signals they manage, giving you greater visibility into the complexities of MAC/PHY interaction. Expand your toolkit with 89600 WLA—and see inside the link.

Get greater visibility into LTE protocol/PHY interaction

- Decode and verify the MAC, RLC, and RRC-layer messages across multiple radio frames
- Seamlessly connect to the 89600 VSA software to troubleshoot devices at the PHY and protocol layers simultaneously
- Use charting capability to view power control, timing advance, HARQ and DCI information
- Save and recall message files or copy to text editor for documentation and sharing of results between groups

www.keysight.com/find/89602B

Applications and Measurement Software (continued)

X-Series Measurement Applications



X-Series measurement applications increase the capability and functionality of your Keysight signal analyzer to speed your time to insight. They provide essential measurements for specific tasks in general purpose, cellular communications, wireless connectivity, and digital video applications, covering more than 40 standards or modulation types. The applications are identical across all of the analyzers, both benchtop and modular. The only difference is the level of performance achieved by the hardware you select. Choose the level of performance necessary for your application and have full assurance that the calculations and algorithms are the same across your signal analyzers, from development into manufacturing.

Free Trial License

Try the X-Series measurement applications free for 30 days. Trial license provides unrestricted use of each application's features and functionality. Redeem a trial license online today.

- **General purpose:** analog demodulation, EMI, FM stereo/RDS, MATLAB, noise figure, phase noise, pulse, remote language compatibility, SCPI language compatibility, VXA vector signal analysis
- **Cellular communication:** 1xEV-DO, cdma2000/cdmaOne, GSM/EDGE/EVO, iDEN/WiDEN/MotoTalk, LTE FDD/TDD, MSR, TD-SCDMA/HSPA, W-CDMA/HSPA+
- **Wireless connectivity:** Mobile WiMAX, *Bluetooth*, Fixed WiMAX, WLAN 801.11a/b/g/n/ac, WiSUN, ZigBee
- **Digital video:** CMMB, digital cable TV, DTMB (CTTB), DVB-T/H/T2, ISDB-T/Tb/TSB/Tmm

For X-Series signal analyzers:

www.keysight.com/find/X-Series_apps

For modular signal analyzers:

www.keysight.com/find/m90Xa

Choosing Measurement Software and Applications

X-Series measurement applications provide embedded format-specific, one button measurements for X-Series and modular analyzers. With fast measurement speed, SCPI programmability, pass/fail testing and simplicity of operation, these applications are ideally suited for design verification and manufacturing.

89600 VSA software is a comprehensive set of tools for demodulation and vector signal analysis. These tools enable you to explore virtually every facet of a signal and optimize your most advanced designs. Use the 89600 VSA software with a variety of Keysight hardware platforms to pinpoint the answers to signal problems in R&D.

www.keysight.com/find/89600

Migration

Migrating from Legacy Spectrum Analyzers

Whether you are working in the aerospace and defense or communications industries, technologies evolve but one thing stays the same: the need to ensure readiness of your test system.

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 X-Series signal analyzers were designed as evolutionary replacements to their in-class benchtop predecessors. Take advantage of the X-Series' performance, flexibility, speed, modern connectivity, and backward compatibility in replacing the legacy HP/Keysight spectrum analyzers to achieve seamless migration and avoid the need to rewrite test software.

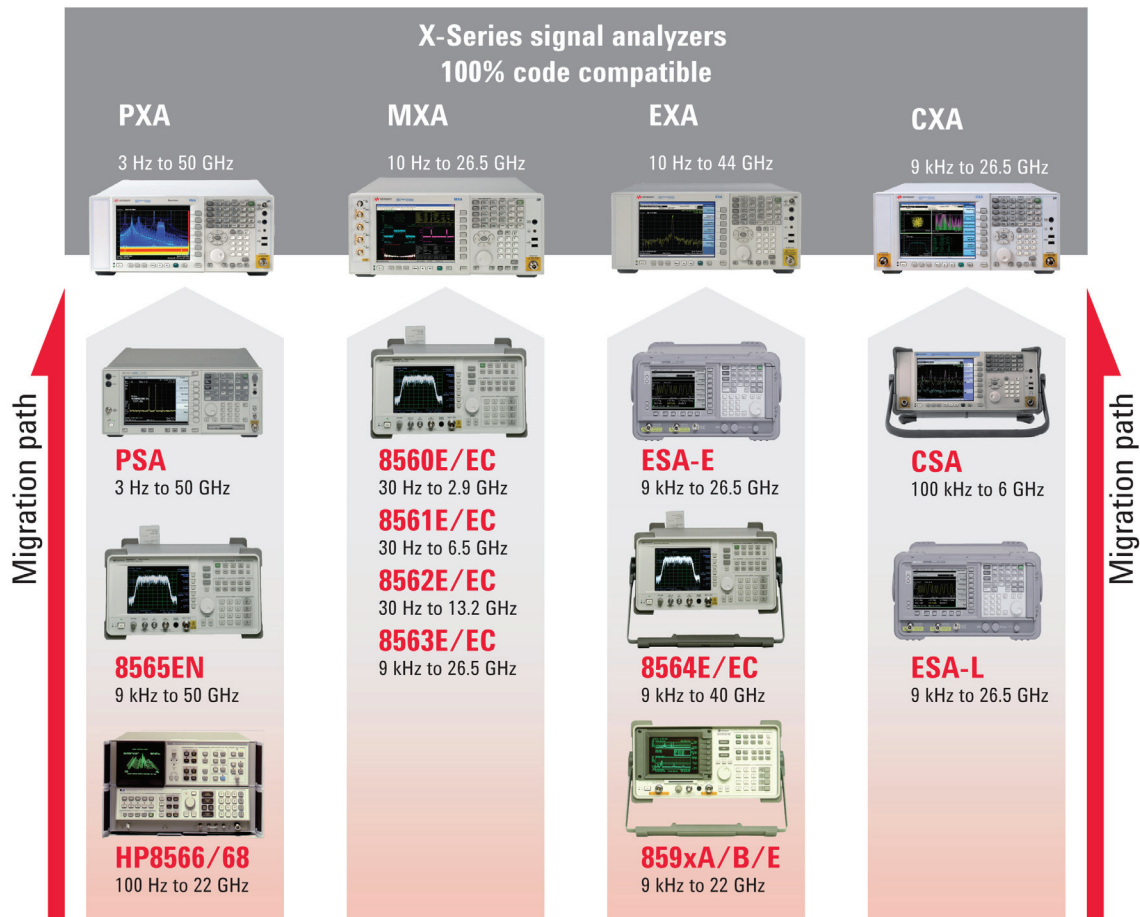
Which migration path is right for you?

Visit our signal analyzer migration page to learn more about migrating from legacy spectrum analyzers to the X-Series signal analyzer that's right for you.

www.keysight.com/find/SA_migration

If you are interested in moving to a handheld spectrum analyzer, please visit www.keysight.com/find/hsa

If you are considering converting your test systems to modular, please visit www.keysight.com/find/pxi



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www.axiestandard.org

www.lxistandard.org

LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. Keysight is a founding member of the LXI consortium.

www.pxisa.org

PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

Three-Year Warranty

www.keysight.com/find/ThreeYearWarranty

Keysight's commitment to superior product quality and lower total cost of ownership. The only test and measurement company with three-year warranty standard on all instruments, worldwide.

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Up to five years of protection and no budgetary surprises to ensure your instruments are operating to specification so you can rely on accurate measurements.

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