Network Analyzer Products

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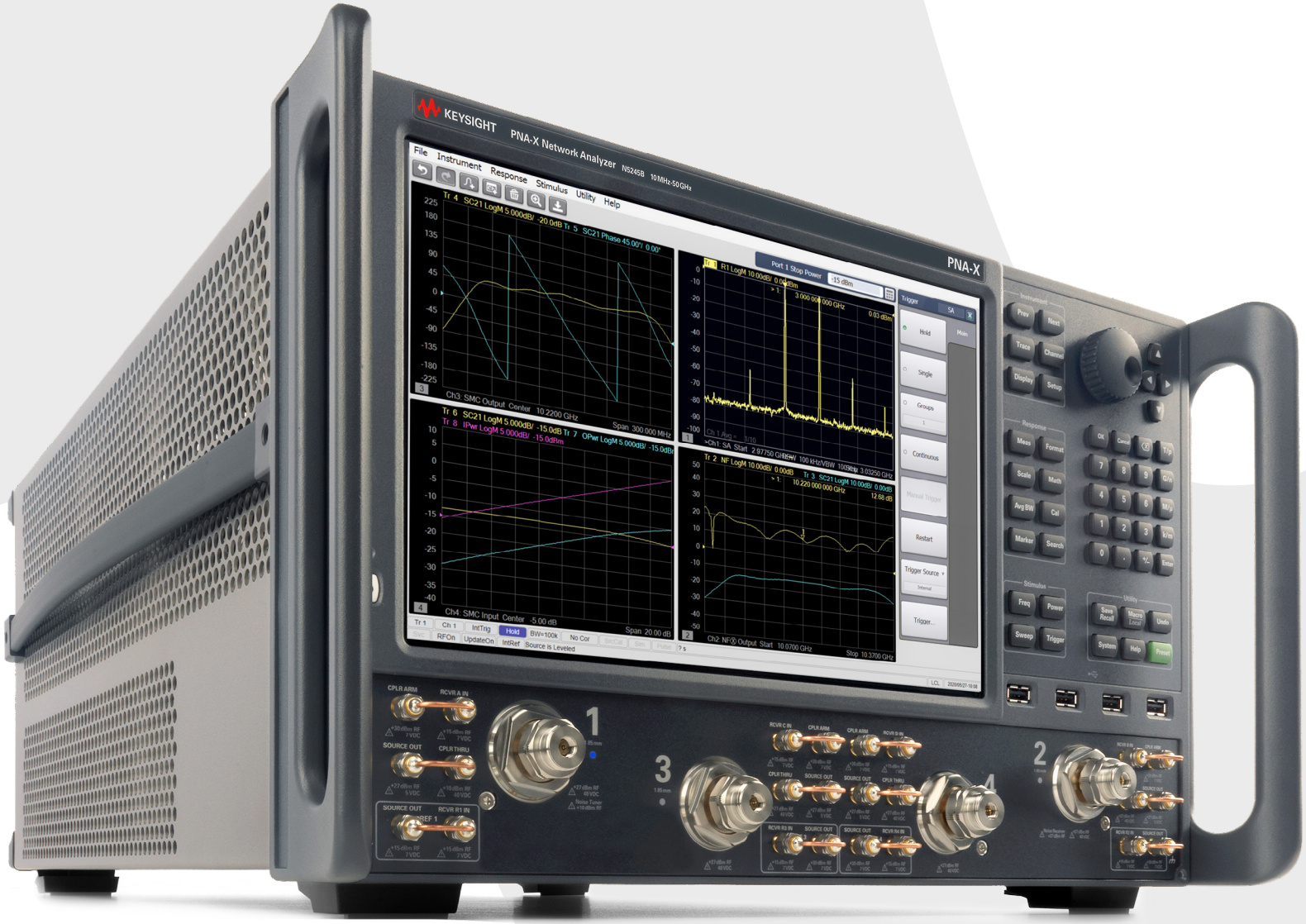

KEYSIGHT

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Gain Deeper Measurement Insights with Keysight Network Analyzers

As microwave and RF devices become more complex, so do your test challenges. Wireless devices operate at even higher frequencies, requiring careful characterization to meet the demands of faster data transmission.

Whether in R&D, manufacturing, or the field, we provide a consistent and reliable measurement solution to help you stay ahead of next-generation device test demands.

Learn why over 70% of engineering teams worldwide select Keysight network analyzers. Available in benchtop, PXI, USB, and handheld form factors, you'll get deeper insights and unrivaled measurement performance for testing basic passive components or highly integrated multiport, millimeter-wave devices.

Find the network analyzer that's right for you

From basic S-parameters to advanced device component measurement from DC to terahertz frequencies, Keysight's broad network analyzer portfolio offers the right balance of price and performance for every application.

KEYSIGHTCARE

Every network analyzer and application software purchase includes KeysightCare. As a KeysightCare subscriber, you get unlimited access to Keysight's technical experts with predictable response times on any instrument, application, or measurement question.

Learn more

Get Started Quickly with General Purpose Network Analysis

Keysight's user-friendly network analyzers help you quickly get started on general-purpose measurements. Train yourself with our quick start guides and library of application notes. We also offer Keysight University, webinars, and consulting services so you can learn directly from the experts.

Entry-level network analyzers for general-purpose measurements

- Characterize simple RF components like antennas, filters, cables, and connectors.
- Measure PCB circuits with the Keysight E5063A's PCB analyzer function.
- Integrate impedance measurements into your network analysis with the Keysight E5061B's impedance analysis.
- Get a compact form factor with no compromise in performance and an industry-standard user interface on the Keysight Streamline Series vector network analyzer.

P9375A Streamline Series USB

General purpose network analyzers

Form factor	Product number	Frequency range	Dynamic range	Output power	Number of ports	
Benchtop	E5063A	100 kHz to 18 GHz	117 dB	0 dBm	2	Get a Quote >
	E5061B	5 Hz to 3 GHz	120 dB	10 dBm	2	Get a Quote >
Streamline series (USB)	P9370A	300 kHz to 4.5 GHz	115 dB	7 dBm	2	Get a Quote >
	P9375A	300 kHz to 26.5 GHz	115 dB	7 dBm	2	Get a Quote >
Streamline series (Thunderbolt)	P9370B	9 kHz to 4.5 GHz	115 dB	8 dBm	2	Get a Quote >
	P9377B	100 kHz to 44 GHz	115 dB	8 dBm	2	Get a Quote >
	P9384B	9 kHz to 20 GHz	115 dB	8 dBm	4	Get a Quote >

View all Keysight Streamline Series USB vector network analyzers.

Resources to help you get started today

Learn what you need to know about RF measurements. Our webinars cover concepts from RF basics to advanced methods for RF testing. Popular on-demand webinars, Network Analysis Fundamentals, and RF Back to Basics take you through the theory behind network analysis, the many measurements you can make with a network analyzer, and how to evaluate instrument specifications.

Browse and attend free classes at Keysight University.

Achieve Complete Device Test

Passive components like filters, connectors, antennas, couplers, and dividers are often integrated into complex sub-assemblies for modern wireless components. A flexible network analyzer can easily perform all the different measurements that these sub-assemblies require, even for some active components like amplifiers.

Network analyzers ready for next-generation passive device test

- Measure wireless sub-assemblies, amplifiers, high-rejection filters, and high-speed digital components.
- Gain deeper insights with software applications like enhanced time domain analysis, spectrum analysis, and pulsed-RF measurements.
- Enhance mixer measurements with an optional second source on the Keysight E5080B and P502xA/B.

E5080B ENA
Vector Network Analyzer

ENA and Streamline USB vector network analyzers

Form factor	Product number	Frequency range	Dynamic range	Output power	Number of ports	
Benchtop	E5080B	9 kHz to 20 GHz or 100 kHz to 53 GHz	140 dB	10 dBm	2, 4	Get a Quote >
Streamline Series (USB)	P5008A	100 kHz to 53 GHz	140 dB	10 dBm	2	Get a Quote >
	P5024A	9 kHz to 20 GHz	140 dB	10 dBm	4, 6	Get a Quote >
	P5028A	100 kHz to 53 GHz	140 dB	10 dBm	4	Get a Quote >
Streamline Series (Thunderbolt)	P5008B	100 kHz to 53 GHz	140 dB	10 dBm	2	Get a Quote >
	P5024B	9 kHz to 20 GHz	140 dB	10 dBm	4, 6	Get a Quote >
	P5028B	100 kHz to 53 GHz	140 dB	10 dBm	4, 6	Get a Quote >

View Keysight's ENA vector network analyzers

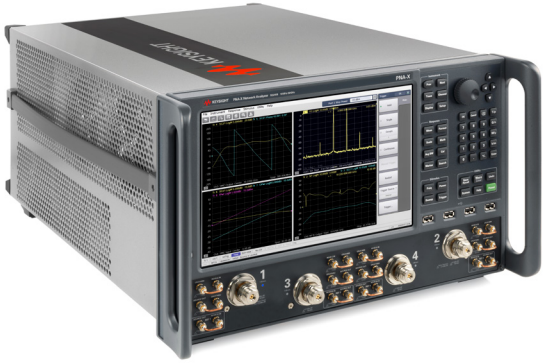
Master the fundamentals

Download this application note for a handy reference on the theory and basic operation of network analyzers.

Download application note

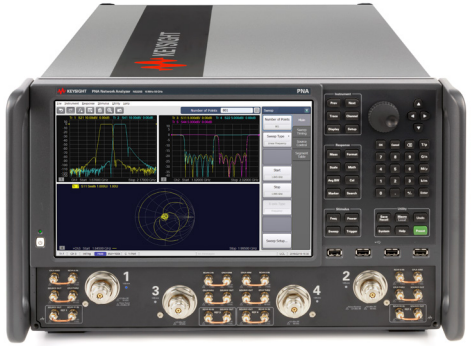
Meet the Challenges of Active and Nonlinear Devices

The Keysight PNA vector network analyzer series helps you meet the most demanding challenges of active device test and advanced applications. The flexible hardware and wide range of software applications provide complex device characterization with multiple measurements over a single connection. Choose from three PNA series to find the performance that's right for you.



PNA-X Series

Flexible applications for complete characterization of linear and nonlinear devices

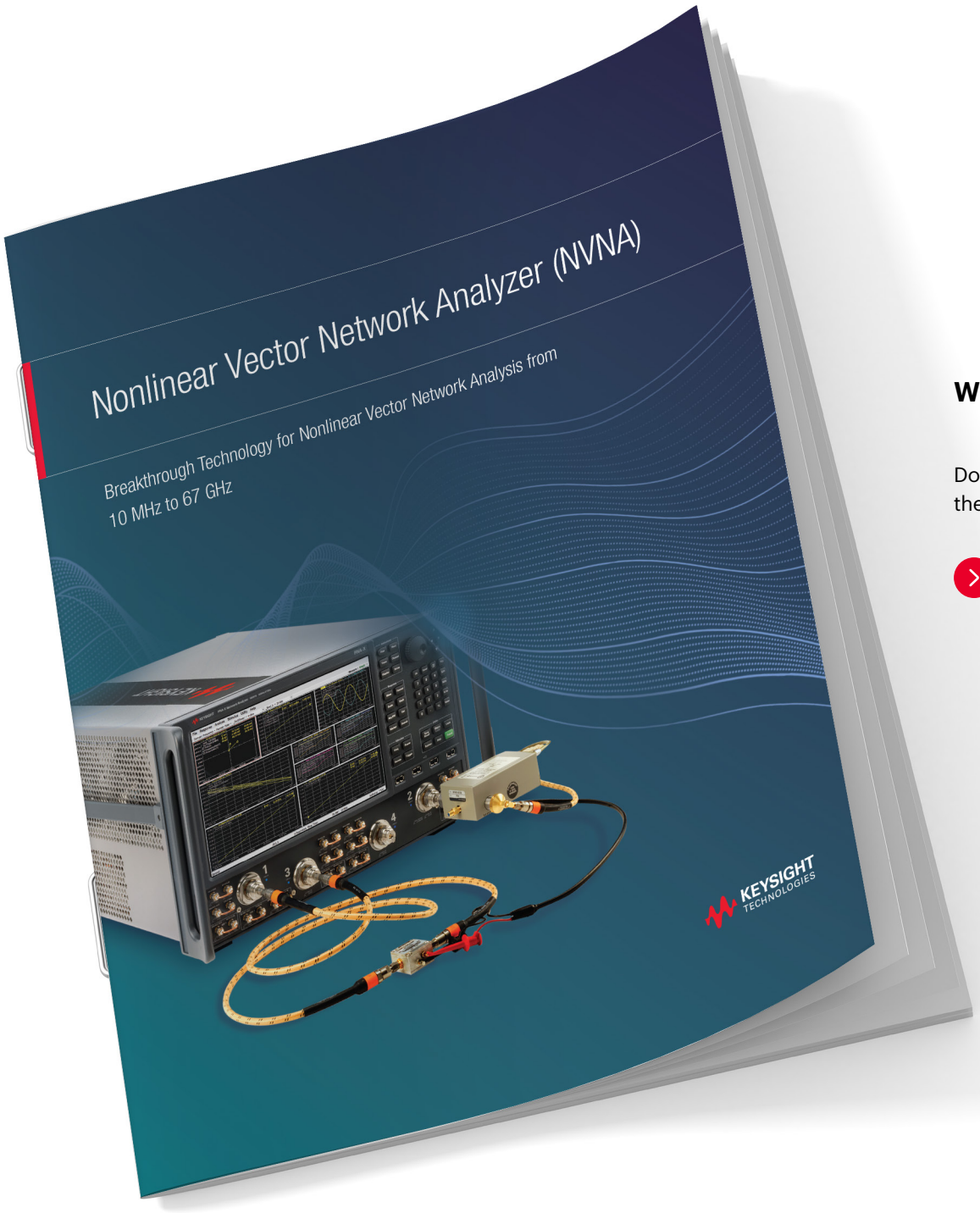


PNA Series

Metrology-grade performance in general-purpose and advanced measurements

PNA-L Series

A balance of price and performance for essential measurements



What is nonlinear vector network analysis?

Download this brochure for a primer on nonlinear devices, their applications, and how to test them effectively.

Download brochure

PNA-X Series vector network analyzers

Simplify your measurement setup with the most flexible and integrated network analyzer available today.

- Perform complete linear and nonlinear device characterization.
- Simplify your test setup by replacing an entire rack of equipment with one PNA-X.
- Easily perform advanced measurements with the industry's broadest portfolio of network analyzer applications.
- Extend the start frequency from 10 MHz to 900 Hz with the low frequency extension (LFE) option.

N5245B PNA-X Microwave Network Analyzer

PNA-X Microwave network analyzers

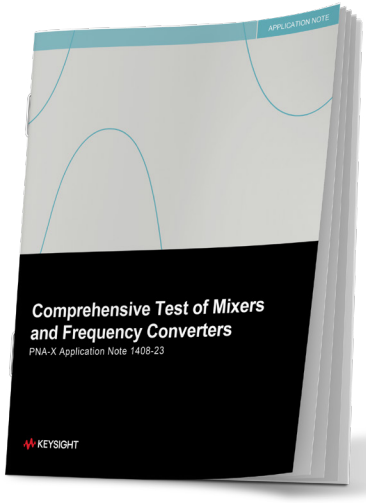
Product number	Frequency range	Dynamic range	Output power	Number of ports	
N5247B	10 MHz to 67 GHz	130 dB	13 dBm	2, 4	Get a Quote >
N5245B	10 MHz to 50 GHz	130 dB	14 dBm	2, 4	Get a Quote >
N5244B	10 MHz to 43.5 GHz	130 dB	14 dBm	2, 4	Get a Quote >
N5242B	10 MHz to 26.5 GHz	133 dB	14 dBm	2, 4	Get a Quote >
N5241B	10 MHz to 13.5 GHz	133 dB	14 dBm	2, 4	Get a Quote >
N5249B	10 MHz to 8.5 GHz	133 dB	14 dBm	2, 4	Get a Quote >

View Keysight's PNA-X family of vector network analyzers

Test Mixers and Frequency Converters with a Single Connection to a PNA-X

Download the application note to learn how you can perform complete characterization for mixers and frequency converters with our PNA-X

Download application note



PNA Series vector network analyzers

Get metrology-grade performance with flexible measurement applications on the PNA Series.

- Meet your toughest measurement challenges with the lowest uncertainty and highest stability of any network analyzer.
- Characterize filters, amplifiers, and mixers with a wide range of software applications.
- Get accurate measurements for your linear active devices and passive devices.
- Extend the start frequency from 10 MHz to 900 Hz with the LFE option.

View Keysight's PNA vector network analyzers

N5227B PNA Microwave Network Analyzer, 67 GHz

Product	Frequency range	Dynamic range	Output power	Number of ports	
N5227B	10 MHz to 67 GHz	130 dB	13 dBm	2, 4	Get a Quote >
N5225B	10 MHz to 50 GHz	132 dB	15 dBm	2, 4	Get a Quote >
N5224B	10 MHz to 43.5 GHz	132 dB	15 dBm	2, 4	Get a Quote >
N5222B	10 MHz to 26.5 GHz	133 dB	14 dBm	2, 4	Get a Quote >
N5221B	10 MHz to 13.5 GHz	133 dB	14 dBm	2, 4	Get a Quote >

PNA-L Series vector network analyzers

PNA-L network analyzers provide the right balance of price and performance.

- Get excellent performance in general-purpose passive device test with proven PNA hardware in an affordable instrument.
- Perform fundamental analysis on passive devices and simple active devices.
- Improve dynamic range with the optional configurable test set with direct receiver access (Option 216/416).

View Keysight's PNA-L vector network analyzers

N5235B PNA-L Microwave Network Analyzer, 50 GHz

Product	Frequency range	Dynamic range	Output power	Number of ports	
N5235B	10 MHz to 50 GHz	122 dB	6 dBm	2	**Get a Quote >**
N5234B	10 MHz to 43.5 GHz	122 dB	6 dBm	2	**Get a Quote >**
N5232B	10 MHz to 20 GHz	133 dB	13 dBm	2, 4	**Get a Quote >**
N5231B	10 MHz to 13.5 GHz	133 dB	13 dBm	2, 4	**Get a Quote >**
N5239B	10 MHz to 8.5 GHz	133 dB	13 dBm	2	**Get a Quote >**

Quickly Characterize Multiport Devices

As devices become more highly integrated, component characterization often involves testing devices with more than four ports. Measuring multiport devices does not have to be tedious. Keysight's multiport network analysis solutions provide fast, reliable results.

Switch-based systems

Achieve multiport measurements with your existing test system

PXI multiport VNA

Directly measure each port without performance degradation from switches

M9019A PXI Chassis with M9804A PXI Vector Network Analyzers

The increasing importance of increasing ports

When you need to measure more than four ports, you should know your options. Download the white paper for an overview of switch-based and PXI multiport solutions and the benefits of each.

Download white paper

Switch-based multiport solutions

Switches are an affordable way to upgrade your existing network analyzer for multiport measurements.

- Use the Keysight E5092A multiport test set with the 4-port E5080B ENA vector network analyzer to make 10-port full crossbar measurements up to 20 GHz.
- Get a compact multiport setup when you pair the Keysight P916xA/B USB solid state switch matrices with the Keysight Streamline Series vector network analyzer.
- Pair a PXI solid state switch matrix (Keysight M916xA/B) with the Keysight M980xA PXI vector network analyzer for a low-cost multiport setup.

View all RF and microwave solid state switches

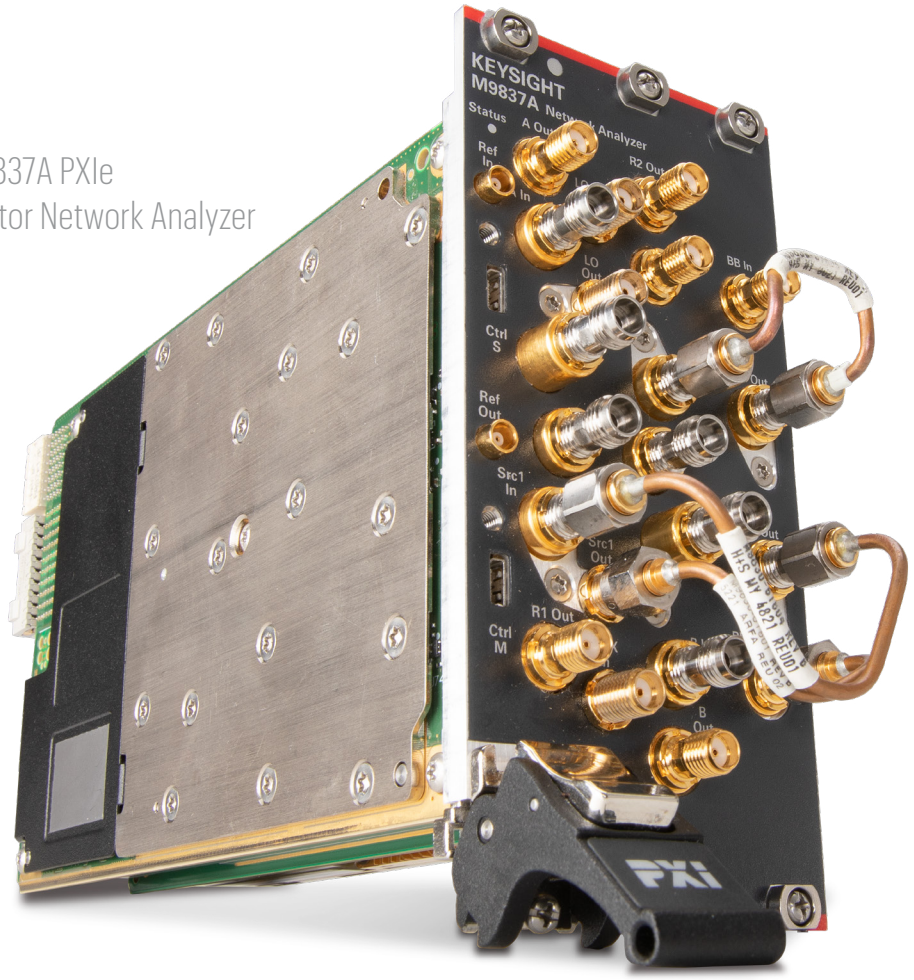
Form Factor	Product	Frequency range	Number of ports	Compatible instruments	
Benchtop	E5092A	50 MHz to 20 GHz	22 ports (10-port full crossbar)	E5080B	Get a Quote >
USB	P9165B	300 kHz to 9 GHz	2x8 ports full crossbar	P937xA P50xxA	Get a Quote >
	P9164B	300 kHz to 9 GHz	2x16 ports full crossbar	P50xxA/B P937xA/B	Get a Quote >
PXI	M9165B	300 kHz to 9 GHz	2x8 ports full crossbar	M980xA	Get a Quote >
	M9164B	300 kHz to 9 GHz	2x16 ports full crossbar	M980xA	Get a Quote >

True multiport vector network analyzers

PXI multiport network analyzers enable you to configure your test setup exactly how you need it. Since each PXI module is an independent VNA, you can also configure your test setup for multisite measurements to measure multiple DUTs simultaneously. Leverage the high-speed PCIe® backplane without performance degradation from switches to get exceptional measurement performance no matter how many ports you use.

- Make multiport and multi-site measurements with the economical M937xA Series.
- Use advanced measurement applications on M980xA Series for wideband component characterization of multiport devices (up to 53 GHz).
- Characterize highly integrated multiport components with a single connection using high-performance M983xA Series.

View Keysight's PXI vector network analyzers



M9837A PXIe
Vector Network Analyzer

Form factor	Product number	Frequency range	Dynamic range	Output power	Number of ports	
PXI	M9375A	300 kHz to 26.5 GHz	115 dB	7 dBm	2 ports per module, up to 32 ports in one PXI chassis	Get a Quote >
	M9804A	9 kHz to 20 GHz	140 dB	10 dBm	2, 4, or 6 ports per module, up to 50 ports in one PXI chassis	Get a Quote >
	M9808A	100 kHz to 53 GHz	140 dB	10 dBm	2 ports per module, up to 34 ports in one PXI chassis	Get a Quote >
	M9837A	10 MHz to 44 GHz	146 dB	18 dBm	2 or 4 ports per module, up to 24 ports in one PXI chassis	Get a Quote >

Perform Modulated Signal Measurements

You need to balance continuous-wave and modulated signal measurements when characterizing antenna arrays and front-end modules. Vector Component Analyzers (VCAs) enable you to perform network analyzer measurements in addition to EVM and ACP over a single connection. Based on the PNA-X or M980xA, the VCA solution adds a modulated signal stimulus to your test setup.

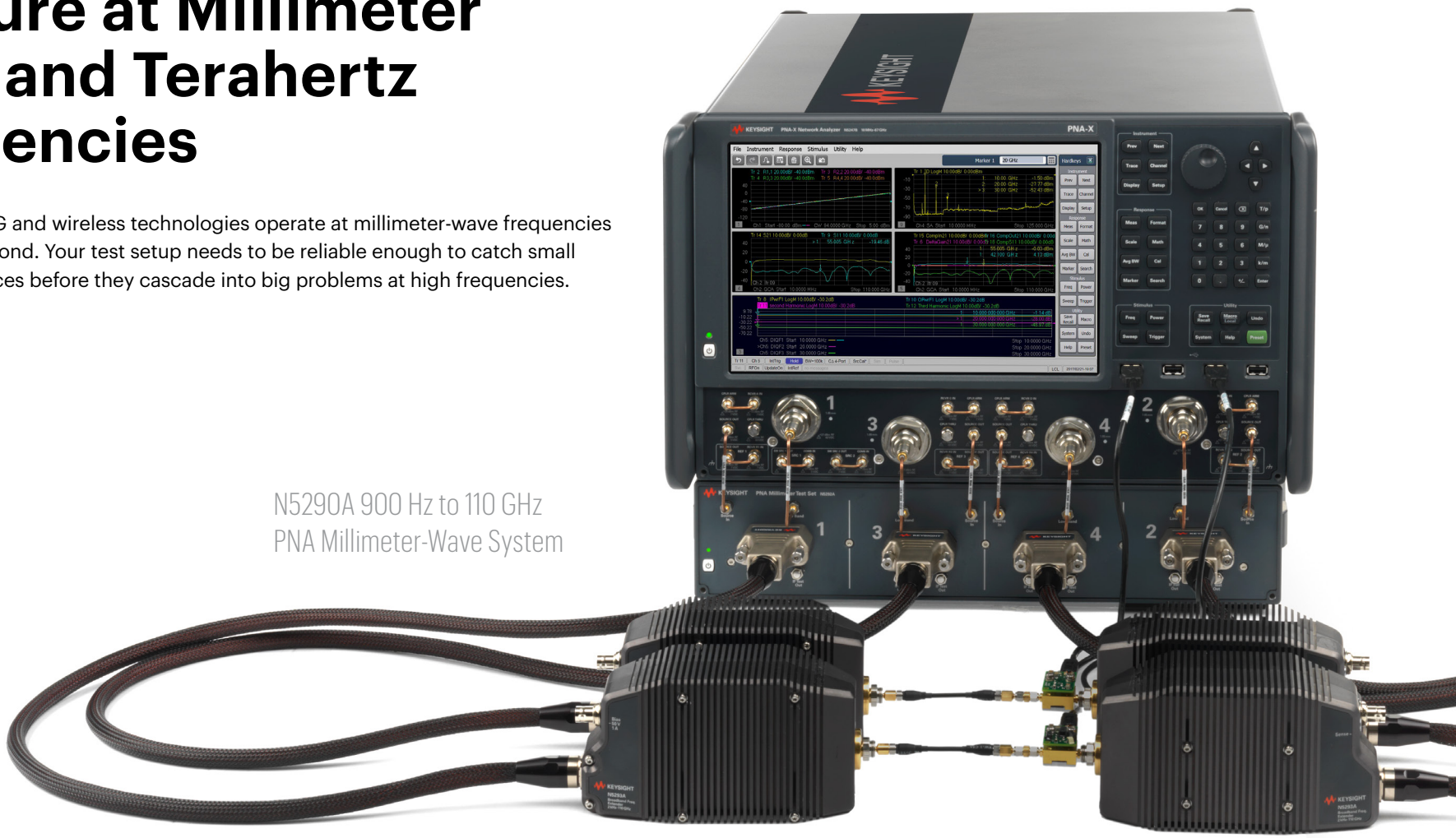
- Choose a benchtop or PXI form factor to fit your measurement needs.
- Measure high-power amplifiers with optional direct receiver access configurations.
- See your devices' true performance with the lowest residual EVM in the industry.

M9818AS PXI Vector Component Analyzer

Form factor	Product number	Frequency range	Noise floor	DANL @ 1GHz	
PXI	M9815AS	100 kHz to 26.5 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >
	M9816AS	100 kHz to 32 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >
	M9817AS	100 kHz to 44 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >
	M9818AS	100 kHz to 53 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >
	M9834A	10 MHz to 20 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >
	M9837A	10 MHz to 44 GHz	-130 dBm at 10 Hz IFBW	-144 dBm/Hz	Get a Quote >

Measure at Millimeter Wave and Terahertz Frequencies

Next-generation 5G and wireless technologies operate at millimeter-wave frequencies of 30 GHz and beyond. Your test setup needs to be reliable enough to catch small errors in your devices before they cascade into big problems at high frequencies.



N5290A 900 Hz to 110 GHz
PNA Millimeter-Wave System

The Keysight N529xA system is based on a powerful PNA or PNA-X and provides continuous sweeps up to 120 GHz.

N5291A 900 Hz to 120 GHz PNA mmWave System

Keysight offers a variety of frequency extenders for banded mmWave measurements up to 1.5 THz.

Affordable E-Band Network Analyzer Systems

Carry Precision with You in the Field

- Use an all-in-one combination analyzer that performs cable and antenna testing, vector network analysis, spectrum analysis, and more.
- Get precision results comparable to benchtop devices at frequencies up to 54 GHz.
- Endure the harshest working conditions with integrated analyzers designed for durability that meets military specifications (MIL-SPEC).
- Equip yourself with a full, two-port vector network analyzer to measure all four mixed-mode S-parameters of your component without having to disconnect it.
- Measure non-insertable devices accurately and easily with two-port error correction.

N9913B FieldFox
Handheld Analyzer

FieldFox handheld RF, microwave, and mmWave analyzers

Product number	Base model	Maximum frequency	Maximum real-time analysis bandwidth	DANL @1 GHz	VNA system dynamic range	Output power	Number of built-in ports	Vector voltmeter	Mixed-mode S-parameters	Distance-to-fault and time domain reflectometry	
N9913A	Combo analyzer	4 GHz	10 MHz	-155 dBm	Up to 100 dB	Up to 1 dBm	2	✓	✓	✓	Get a Quote >
N9913B	Combo analyzer	4 GHz	120 MHz	-163 dBm	Up to 117 dB	Up to 9 dBm	2	✓	✓	✓	Get a Quote >
N9926A	Vector network analyzer	14 GHz	—	—	Up to 100 dB	Up to 1 dBm	2	✓	✓	✓	Get a Quote >
N9928A	Vector network analyzer	26.5 GHz	—	—	Up to 100 dB	Up to 1 dBm	2	✓	✓	✓	Get a Quote >
N9950A	Combo analyzer	32 GHz	10 MHz	-159 dBm	Up to 110 dB	Up to 4 dBm	2	✓	✓	✓	Get a Quote >
N9951B	Combo analyzer	44 GHz	120 MHz	-163 dBm	Up to 121 dB	Up to 6 dBm	2	✓	✓	✓	Get a Quote >
N9952B	Combo analyzer	50 GHz	120 MHz	-163 dBm	Up to 121 dB	Up to 6 dBm	2	✓	✓	✓	Get a Quote >
N9953B	Combo analyzer	54 GHz	120 MHz	-163 dBm	Up to 121 dB	Up to 6 dBm	2	✓	✓	✓	Get a Quote >

View Keysight's FieldFox handheld analyzers

Techniques for time domain measurements

Learn about time domain measurement techniques for identifying the location and relative amplitudes of discontinuities while operating in the field.

Download the application note

Software-enabled, field-upgradeable measurement capabilities

- Work with over 25 measurement software applications on a single user interface with customizable parameters for quick measurements.
- Stay ahead of changing measurement requirements by upgrading your handheld analyzer in the field with convenient, user-installable license keys.
- Measure high-rejection, narrowband devices with 117 dB of dynamic range.
- Remove unwanted responses like connector mismatch or cable discontinuities using time gating.
- Display results in either the time or frequency domain.

Try Keysight's Materials Measurement Software for Free

FieldFox pairs with Keysight's N1500A Materials Measurement Suite software to help you determine the intrinsic electromagnetic properties of many dielectric and magnetic materials. The software automates complex permittivity and permeability measurements with your choice of measurement methods and instruments.

Download a free 30-day N1500A Materials Measurement Suite trial license

Expand the Capabilities of Your Network Analyzer with Application Software and Services

Modern device characterization requires more than just S-parameters. Our network analyzer software brings you faster insights and turns your network analyzer into a complete RF test solution. Let the software guide you through the setup and analysis of advanced measurements such as time domain, noise figure, spectrum analysis, and more.

View all network analyzer software.

Try it yourself

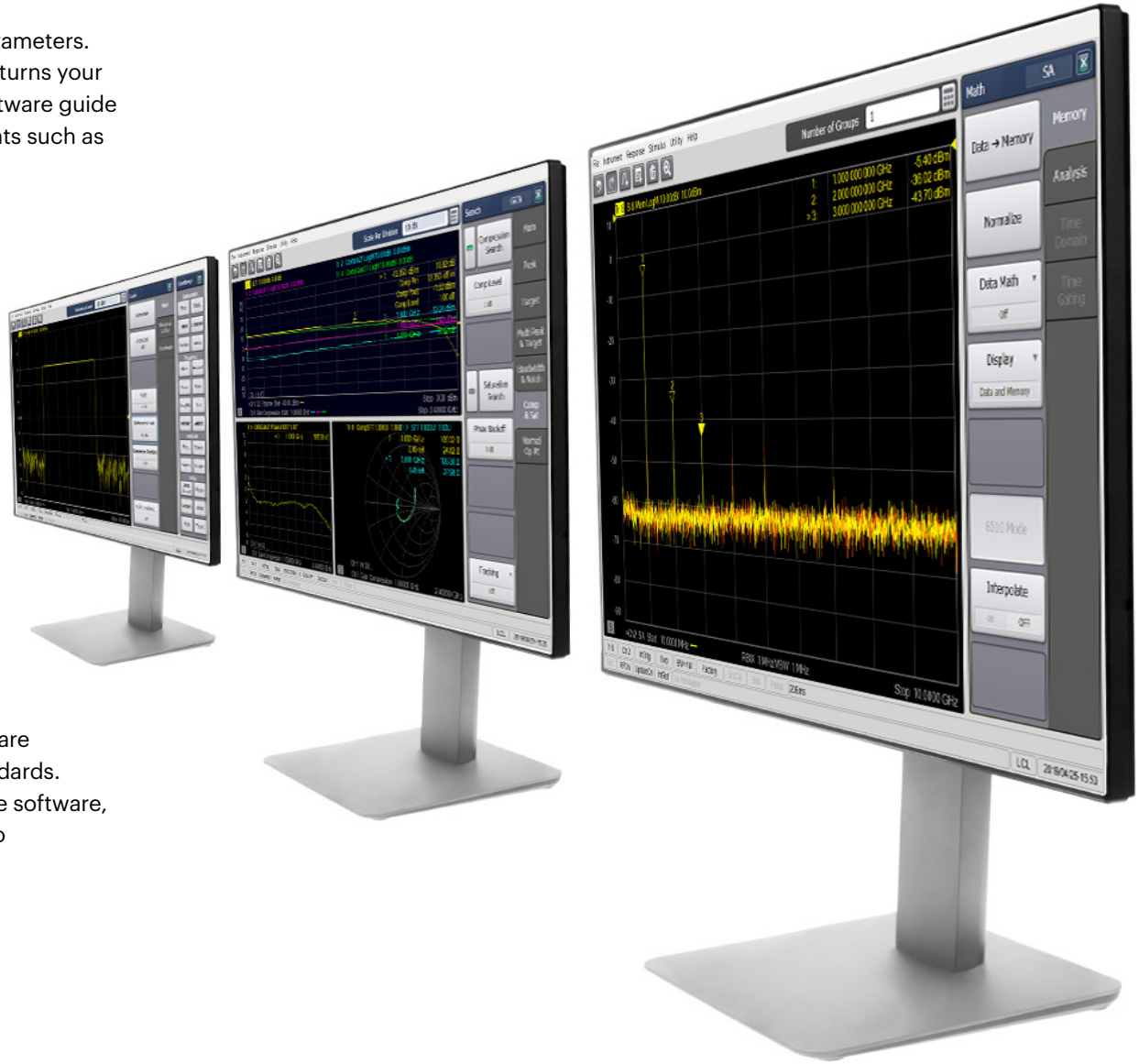
Download a complimentary 30-day software trial for your instrument using the link on the software application's web page. You can also browse popular network analyzer software trials here.

Ensure your network analyzer evolves as technologies do

KeysightCare Application Software Support keeps your software current with the latest enhancements and measurement standards. Receive priority access to application experts familiar with the software, the latest standards, and techniques that provide insights into measurement challenges and emerging technologies.

KEYSIGHTCARE

Learn more



Remove the Barriers to Your Success with KeysightCare

Support portal

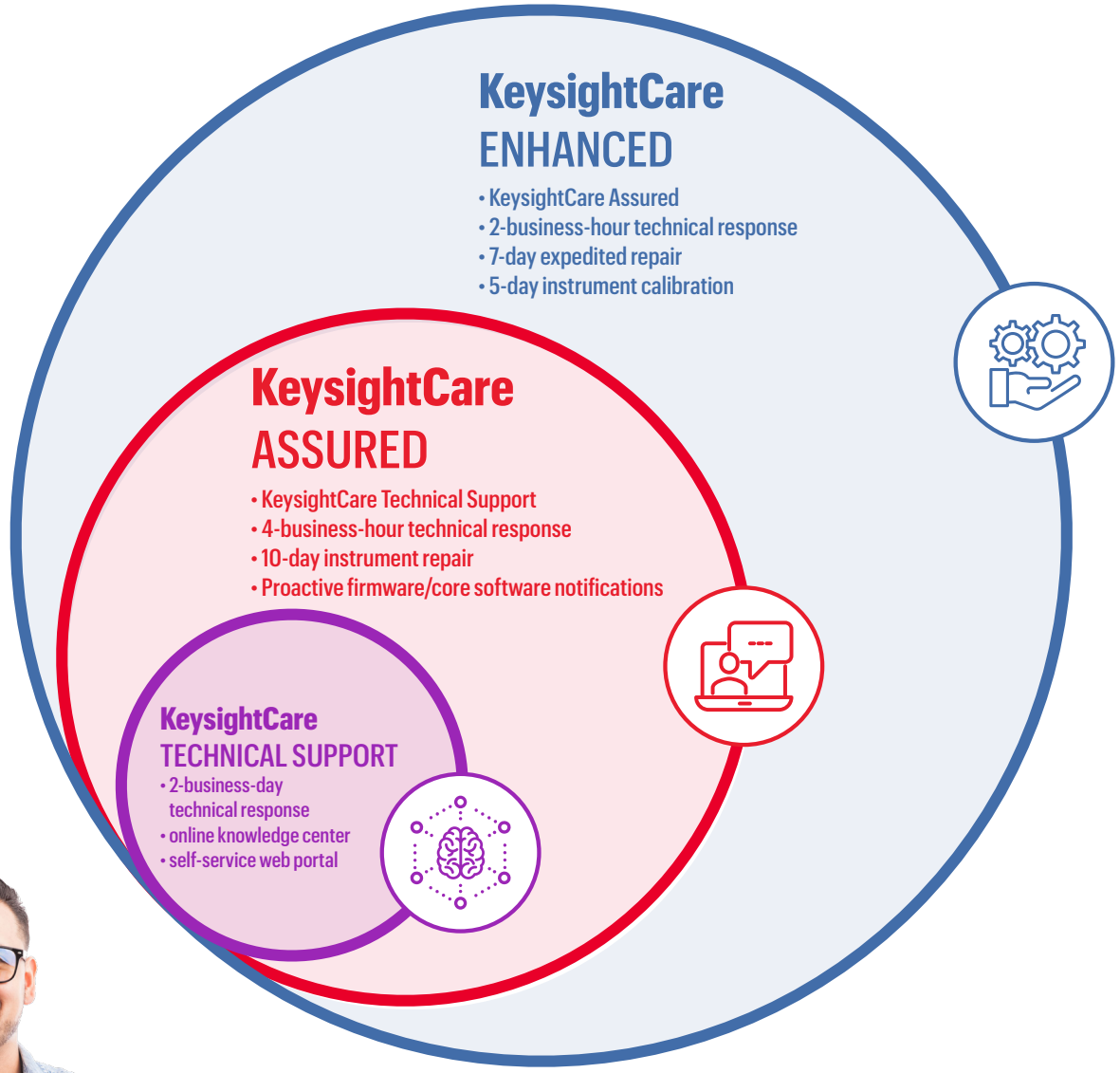
Receive personalized, proactive, and priority support. Find answers in the knowledge center, manage service requests, and interact with Keysight experts. Start **here**.

Access to experts

Every high-performance network analyzer purchase includes 1 year of **KeysightCare Assured**. Get unlimited access to Keysight's technical experts on any instrument, application, or measurement question in addition to a worry-free warranty.

Lock in price & peak performance

Extend your peace of mind and eliminate budgetary surprises for up to 5 years with **KeysightCare Enhanced**. Trust your test results with calibrated in tolerance instruments and accurate measurements.



Learn more

Accelerate the Win with Help from Keysight Services

Prevent delays caused by technical questions or system downtimes due to instrument maintenance and repairs. The Keysight Services team is here to support you with expert technical support, instrument repair and calibration, software support, training, and more.

Maximize your test system up-time by securing technical support, repair and calibration services with committed response and turnaround times. **High-performance instruments include 1-year KeysightCare Assured.**

KeysightCare Enhanced * (includes tech support, warranty and calibration)

R-55B-001-1	KeysightCare Enhanced - Upgrade 1 year
R-55B-001-2	KeysightCare Enhanced - Extend to 2 years
R-55B-001-3	KeysightCare Enhanced - Extend to 3 years
R-55B-001-5	KeysightCare Enhanced - Extend to 5 years

*available in select countries. For details, please view the data sheet. R-55B-001-2/3/5 must be ordered with R-55B-001-1.

KEYSIGHTCARE

Get service prices for your instrument model

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.