Vector Network Analyzers

CATALOG

KEYSIGHT

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Keysight Benchtop Vector Network Analyzers

One family. Three performance grades. 4 classes.

ESSENTIAL

XN3-class

- 1 Maximum number of sources
- 3 GHz to 18 GHz Maximum frequency

EXPERT

XN5, XN7-class

- 2 Maximum number of sources
- 26.5 GHz to 67 GHz Maximum frequency

PRO

XN8-class

- 3 to 4 Maximum number of sources
- 26.5 GHz to 67 GHz Maximum frequency

Introduction

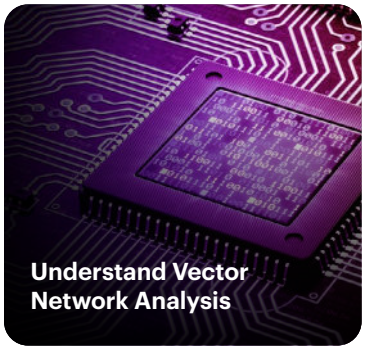
Keysight Vector Network Analyzers — from basic network analysis to complex characterization

Keysight benchtop vector network analyzers (VNAs) are now offered in four capability classes across three performance grades. Essential, our most affordable entry-level VNAs, include the XN3-class, providing up to 18 GHz maximum frequency on one source and are optimal for passive component testing. Expert includes the XN5- and XN7-class, extending up to 67 GHz maximum frequency with two sources for active device measurements. XN8-class Pro VNAs deliver our highest-performance features, ideal for next-generation design and complex active device development when three to four sources are needed. A comprehensive library of VNA resources is available to help you find the performance grade and class best suited to your lab.

Get better insights with greater precision

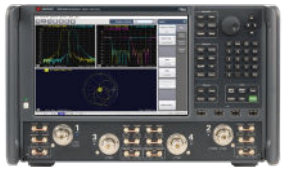
The VNA is a fundamental test instrument for any RF engineer. Whether you design, develop, or manufacture devices, you need accurate and reliable tools to measure and analyze components to be successful. Keysight courses cover the basics and enhanced applications to help you develop a deeper understanding of vector network analyzers.

Here are a few examples of the resources you will find to help you select the VNA that is right for you:



Benchtop Vector Network Analyzers

Keysight benchtop vector network analyzers enable you to validate designs, characterize components, and ensure quality during production. Select the VNA you need based on the number of sources, integrated low-noise receivers, maximum frequency, and more. Explore our wide range of benchtop vector network analyzers from Essential to Pro performance grades to find the one that is right for your application.



	Essential **XN3-class**	Expert **XN5, XN7-class**	Pro **XN8-class**
Maximum number of sources	**1**	**2**	**3 to 4**
Integrated low-noise receiver	**0**	**0 to 2**	**1 to 2**
Maximum frequency	**3 GHz to 18 GHz**	**26.5 GHz to 67 GHz**	**26.5 GHz to 67 GHz**
Number of built-in ports	**2**	**2, 4**	**2, 4**
Brands included	**E5061B** **E5063A**	**ENA-X** **PNA-L** **PNA** **E5080B** **N5264B**	**N5241B-N5249B** **PNA-X Pro**
	Explore	Explore	Explore

Essential Benchtop Vector Network Analyzers

Throughput and reliability for critical network analysis

Keysight XN3-class Essential vector network analyzers include the E5063A and E5061B ENAs. Essential VNAs leverage Pro model technology optimized for passive component testing. You can quickly get valuable measurement insights with automated testing and optional measurement software ranging from impedance analysis to basic pulsed-RF measurements. Our affordable, Essential model offers frequency coverage down to 5 Hz, ideal for testing devices like DC-DC converters and power-line electromagnetic interference filters. Our top Essential model leverages the consistent measurement framework of our Expert models to boost efficiency and productivity. Choose one of our most popular configurations or build the one you need for your application.

Learn more about our Essential benchtop vector network analyzers

Passive component test

Analyze the performance of passive components like resistors, antennas, or attenuators with measurements including S-parameter, phase response, and group delay.

Receiver sensitivity

Ensure reliable and repeatable passive component measurements with a >100 dB dynamic range to capture low-power signal responses.

Signal integrity analysis

Diagnose and optimize high-speed electronic performance using enhanced time-domain analysis measurement capabilities like time-domain reflectometry (TDR).

Software applications

Characterize a variety of device parameters using optional test applications like impedance and time-domain measurements.

Class	Included Brands	Range of Performance Specifications		
		Maximum Number of Sources	Maximum Frequency	Number of Built-In Ports
XN3	E5063A and E5061B	1	3 GHz to 18 GHz	2

View popular configurations

Expert Benchtop Vector Network Analyzers

Enhanced network analysis for nonlinear device test

Keysight Expert vector network analyzers come in two classes. The XN5-class includes the ENA-X, PNA-L, and E5080B ENA. The XN7-class includes the PNA and N5264B PNA-X. They build upon our Essential VNA's passive component test capabilities, adding active device measurements and offering metrology-grade performance in our top Expert models. With more than 120 software options available, you can characterize the nonlinear behavior of devices like RF power amplifiers, mixers, and modulators quickly and accurately. Plus, the direct digital synthesis (DDS) sources in our top Expert models provide up to 10 times faster phase and group delay measurements than our Essential VNAs. Choose one of our most popular configurations or build the product you need for your application.

Learn more about our Expert benchtop vector network analyzers

Active device test

Test gain compression, distortion, and phase versus drive for active devices like power amplifiers and single-stage mixers.

5G New Radio FR2 / FR3 coverage

Active device test across the millimeter-wave spectrum ensures very high frequency and data rate performance.

Enhanced signal analysis

Built-in spectrum analysis, error vector magnitude (EVM), and adjacent channel power ratio (ACPR) measurements.

Sub-THz compatibility

Conduct sub-THz measurements up to 250 GHz using compatible compact frequency extenders.

Class	Included Brands	Range of Performance Specifications			
		Maximum Number of Sources	Integrated Low-Noise Receiver	Maximum Frequency	Number of Built-In Ports
XN5	ENA-X, PNA-L, and E5080B	2	0 to 2	44 to 53 GHz	2, 4
XN7	PNA and N5264B	2	0	26.5 GHz to 67 GHz	2, 4

View popular configurations

Pro Benchtop Vector Network Analyzers

Highest-performance vector network analyzers

Keysight XN8-class Pro vector network analyzers include the N5241B-N5249B PNA-X and PNA-X Pro. Pro VNAs are our highest-performance benchtop models, ideal for next-generation design and complex active device development. Expanding beyond our Advanced model capabilities, our Pro models additionally deliver built-in measurements for complete active device test, a configurable architecture, and up to four integrated sources in our top Pro model. Choose one of our most popular configurations or build the product you need for your application.

Learn more about our Pro benchtop vector network analyzers

Complex active device test

Provides built-in measurements like intermodulation distortion, power compression, and wideband active load pull.

Hardware integration

Integrated, independent, high-speed, ultra-low phase noise RF signal sources simplify your measurement setup.

Configurable architecture

Direct receiver access and up to sixteen front-panel loops enables precision analysis on a wide variety of complex active devices.

Comprehensive test coverage

Compatible with the widest variety of passive and active device measurement software applications to simplify and automate testing.

Class	Included Brands	Range of Performance Specifications			
		Maximum Number of Sources	Integrated Low-Noise Receiver	Maximum Frequency	Number of Built-In Ports
XN8	N5241B-N5249B, PNA-X Pro	3 to 4	1 to 2	26.5 GHz to 67 GHz	2, 4

View popular configurations

Modular Vector Network Analyzers

Scalability and speed for multiport network analysis

Keysight modular vector network analyzers provide you with Essential benchtop level-performance in a compact, flexible form factor, helping you scale your multiport and multidevice testing needs. While the dynamic range of conventional switch-based systems limits measurement speed, modular VNAs allow wider intermediate frequency bandwidths to test faster. Support up to 50 ports in a single chassis.

With models ranging from 9 kHz to 53 GHz, select the modular VNA that is right for your application.

See catalog

Maximum number of sources	**1**
Maximum frequency	**4.5 GHz to 53 GHz**
Dynamic range @ 50 GHz	**115 dB to 146 dB**
Configurable test ports	**0 to 2**

USB Vector Network Analyzers

Compact form factor for portable benchtop network analysis

Keysight XN4-class USB vector network analyzers include the Streamline Series VNAs. They provide high performance in a lightweight, portable form factor — ideal for labs with limited space. Unlike benchtop vector network analyzers, which are standalone instruments, USB VNAs connect to a host PC to handle data processing and analysis.

Transfer your component characterization data across the workflow easily using the same user interface, measurement capabilities, and automation code as our benchtop and modular vector network analyzers. Get the same measurement reliability as our Essential benchtop VNAs in a portable unit. With models ranging from 2 to 6 ports, select the USB vector network analyzer that is right for your application.

Learn more about our USB vector network analyzers

Portable form factor

Benchtop measurements in a lightweight, compact unit make it ideal to easily share between lab benches.

Secure environment

Reduce data breach concerns when testing in secure environments by using a USB VNA with no onboard memory.

Multiport measurements

Cascade multiple USB vector network analyzers to configure a stackable, multiport test solution.

Consistent user experience

Integrate USB VNAs into your workflow with the same user interface as our Essential VNAs.

Number of built-in ports	**2, 4, 6**
Maximum frequency	**20 GHz to 53 GHz**
Maximum output power	**8 dBm to 10 dBm**
Maximum number of sources	**1**

View popular configurations

Handheld Vector Network Analyzers

Rugged and portable for comprehensive RF field testing

The Keysight handheld VNA is a versatile tool for RF field testing, offering comprehensive capabilities in cable and antenna testing, spectrum analysis, power measurements, and pulse generation. With over 25 license key-activated software options, you can remotely upgrade your vector network analyzer anytime to meet your field-testing needs. Key measurement capabilities include:

Vector network analysis

Perform in-depth troubleshooting and maintenance for RF cables and antennas, identifying faults with time-domain reflectometry and measuring S-parameters.

Spectrum analysis

Identify interfering signals, verify signal coverage, detect interference, and optimize network performance. Leverage gapless IQ data for spectrum monitoring, demodulation, and decoding and measure 5G NR signal quality metrics.

Power measurements

Make accurate, user-definable channel power measurements with the built-in power meter. Pair with an external USB peak power sensor to efficiently characterize pulsed RF signals.

Signal generation

Generate analog modulations and user-defined pulse sequences with the built-in pulse signal generator.

VNA capabilities	**Model dependent**
Maximum frequency	**10 GHz to 54 GHz**
Maximum analysis bandwidth	**40 MHz to 120 MHz**

View popular configurations

Learn more about our handheld vector network analyzers

Software and Accessories

Find compatible software and accessories for your vector network analyzer

Explore the wide variety of component characterization software on Keysight vector network analyzers. These VNAs provide exceptional support for testing both passive and active components — ranging from materials and high-speed serial interconnects to amplifiers, frequency converters, and beyond. Our wide range of measurement applications offers coverage spanning critical network analysis to complex characterization, including measurements like spectrum analysis, EVM, ACPR, and more.

Pair your software with the cables, fixtures, and calibration kits needed to make the network analysis measurements for your application.

Power your VNA with a wide range of specialty software:

- time-domain analysis
- signal analysis
- impedance analysis
- noise figure analysis
- intermodulation distortion analysis
- modulation distortion analysis
- gain compression

Explore software

Get more functionality out of your VNA by pairing it with the right accessories, including:

- mechanical and electrical calibration kits
- adapters
- cables and leads
- attenuators
- frequency extenders
- power sensors
- coaxial terminations (loads)
- termination adapters

Explore accessories

Keysight Support Services

Explore the services that are right for you

Keysight Support Services can reduce your learning curve, enhance your uptime, guarantee the accuracy of your testing equipment, and provide the expertise you require, precisely when and where you need it.

Maximize your instrument uptime, quickly optimize your test measurements, and get the answers you need at our fastest available times. KeysightCare curated support plans bundle critical services with prioritized response and turnaround times. **High-performance instruments include one year of KeysightCare Assured.**

Explore support services

Calibration

Ensure your test system performs to specification and meets local and global standards.

Repair

Restore equipment to original functionality and specifications with trained technicians.

KeysightCare

Innovate at speed with curated support plans and prioritized response and turnaround times.

Education

Make measurements quickly with eLearning and in-house, instructor-led training.

Keysight Support

Get 24x7 access to service requests, case management help, and technical articles.