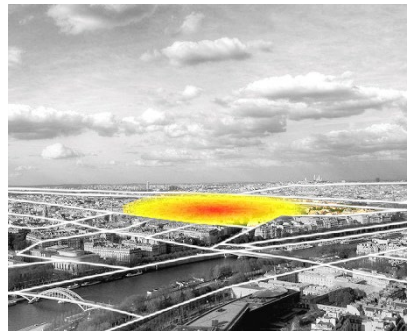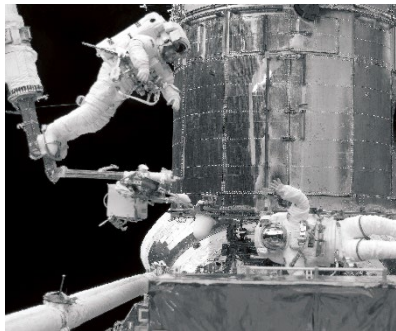# Helping You Focus
Where It Counts
in Aerospace and Defense

KEYSIGHT

Focus Where It Counts

As missions evolve, one thing stays the same: the need to protect those who go in harm's way. To keep them safe, you need the right test tools to ensure your systems are ready and operating at optimal performance. As technology becomes more complex, ensuring readiness gets tougher.

When you leverage our expertise in test and measurement, you'll have more time for the bigger issues: fulfilling today's mission and managing the transition to what comes next. By helping you build greater assurance in system readiness, Keysight Technologies, Inc. frees you to focus where it counts most.

Test and Measurement Solutions

Keysight can help you maximize your system efficiency, performance and readiness through proactive migration and modernization. You can use our high-performance test equipment to test your systems today and upgrade them to meet tomorrow's requirements. We work to ensure the cost of ongoing, long-term support is affordable and consistent with changes in your priorities and budgets — across the life of your systems. We provide you with leading applications and solutions for the aerospace and defense industry—for radar, electronic warfare, military communications, satellite testing, homeland security, avionics, guidance, navigation and GPS systems.

RADAR/EW

Conquer the complexity of radar and electronic warfare

As technology evolves, so do your challenges in detection, avoidance, electronic warfare (EW) and counter-measures. From simulations of an arriving wavefront with multiple emitters to testing of precision components in a receiver, our solutions can help you conquer the complexity of radar and EW applications.

For application notes, training opportunities, test equipment information and more, visit www.keysight.com/find/radarew
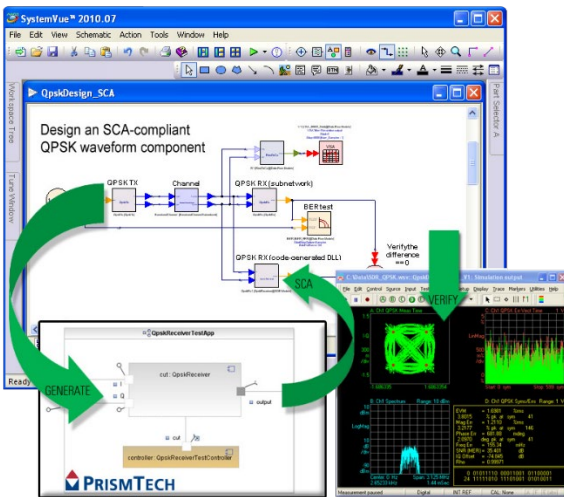

Keysight M9392A: M9392A PXI microwave vector signal analyzer enables measurements up to 26.5 GHz with 250 MHz bandwidth for radar and avionics applications.

MILCOMM

Ensure interoperability of your military communication systems

To keep pace with existing and future missions, you need measurement solutions that can test versatile radios throughout their lifecycles. From dynamic probing inside an FPGA to testing digital IF and RF subsystems, we can help you ensure system readiness.

For application notes, training opportunities, test equipment information and more,
visit www.keysight.com/find/militarycomms

Keysight teams with PrismTech to provide connected Algorithm-to-SCA flow for software-defined radios.

SATELLITES

Make sure your satellites work right the first time

From guidance systems to satellite payloads to microwave communications — design and validation tools from Keysight provide greater assurance that your satellite and its subsystems will work the first time, every time, for the duration of the mission.

For application notes, training opportunities, test equipment information and more, visit www.keysight.com/find/satellite

Keysight E4360A solar array simulators: verify satellite PCDU functionality under realistic environmental and operational conditions such as eclipse, spin, and battery charging.

AVIONICS

Ensure the accuracy and reliability of your avionics, guidance, and navigation systems

The need for accuracy and reliability of avionics, guidance, and navigation systems is necessary whether you're testing to achieve regulatory certification or meet demanding system specifications. Solutions from Keysight enable extensive testing of the systems that ensure safe, successful journeys.
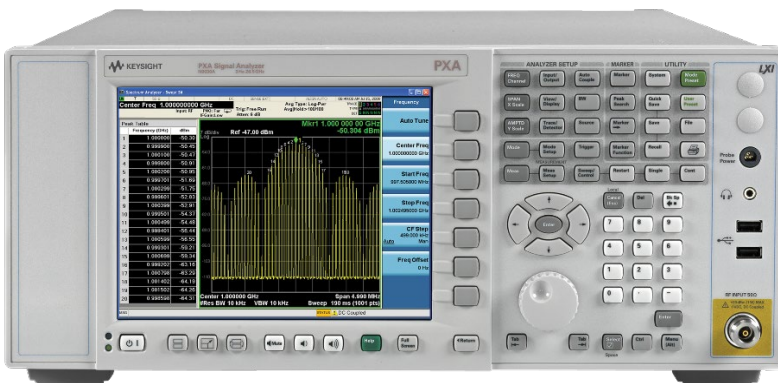
www.keysight.com/find/avionics

Keysight calibration systems provide automated calibration for spectrum analyzers, systems, signal generators and power sensors.

Key Products for Aerospace and Defense Test Applications

Signal analyzers

Keysight's signal and spectrum analyzers, from DC to 50 GHz; up to 325 GHz with external mixing allow accurate frequency, amplitude and modulation measurement, including distortion, spurious, phase noise, and military wireless communications signals. X-series analyzers are upgradeable as needs change.
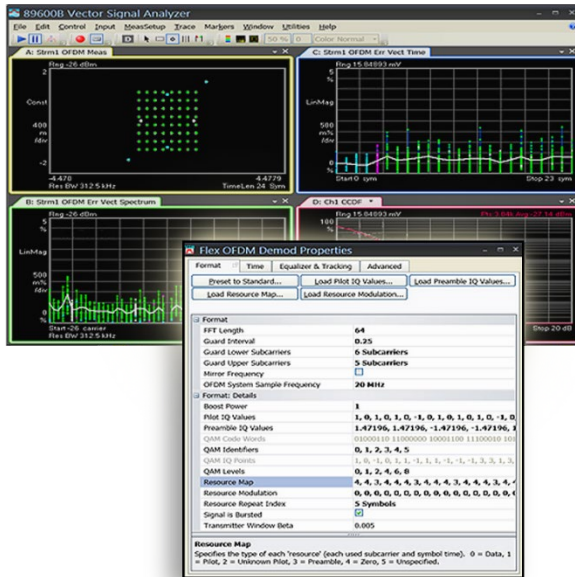
www.keysight.com/find/X-series

The future-ready PXA is the evolutionary replacement for your current high-performance analyzer.

- 140 MHz analysis bandwidth
- 172 dBm DANL with Noise Floor Extension (NFE)
- 129 dBc/Hz phase noise at 10 kHz offset

VSA (Vector Signal Analysis) software

The 89601B provides a window into virtually every facet of a signal problem so you can see the "why?" behind unexpected signal interactions.

www.keysight.com/find/89600B

Find the root cause of signal problems with advanced troubleshooting tools in the time, frequency and modulation domains.

- Works with signal analyzers, oscilloscopes and logic analyzers in RF, IF and digital domains
- More than 70 signal standards and modulation types supported
- Supports multichannel measurements up to 4 channels

M9392A PXI vector signal analyzer

The Keysight M9392A is a PXI vector signal analyzer with frequency coverage from 50 MHz to 26.5 GHz and 250 MHz of instantaneous bandwidth.
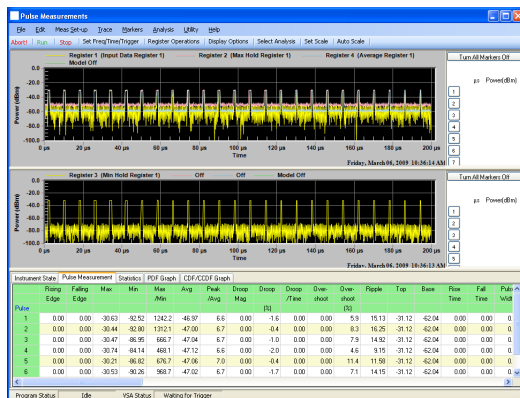
www.keysight.com/find/M9392A

Combine with the 89601A VSA software for a complete microwave vector signal analyzer solution enabling analysis of communications, radar, and avionics signals in a modular, open-system standard.

- PXI form-factor; MOSA conformant
- 12-bit 2 GSa/s digitizer

Pulse measurement software

The N9051A pulse measurement software measures a wide range of pulse parameters and statistics.

www.keysight.com/find/N9051A

N9051A pulse measurement software

- Works on signal analyzers and oscilloscopes
- Measures common pulse parameters
- Display up to 999 pulse parameters and cumulative statistics over time

Signal generators

Keysight offers the widest selection of base band, RF, and microwave signal generators from baseband to 67 GHz, with frequency extensions to 500 GHz. Available signal creation software simplifies the generation of complex pulse trains and modulations.

www.keysight.com/find/sg
www.keysight.com/find/signalstudio

The E8267D PSG vector signal generator provides flexible I/Q modulation up to 44 GHz

- Up to 2 GHz RF modulation bandwidth
- Output power up to +18 dBm
- Typical 1 GHz phase noise of --143 dBc/Hz at 10 kHz offset
- Signal Studio software available for quick creation of Keysight-validated and performance-optimized reference signals

Function and arbitrary waveform generators

Keysight offers a range of arbitrary waveform generators to generate pulses, pattern, modulations, noise and arbitrary signals up to 12 GSa/s.
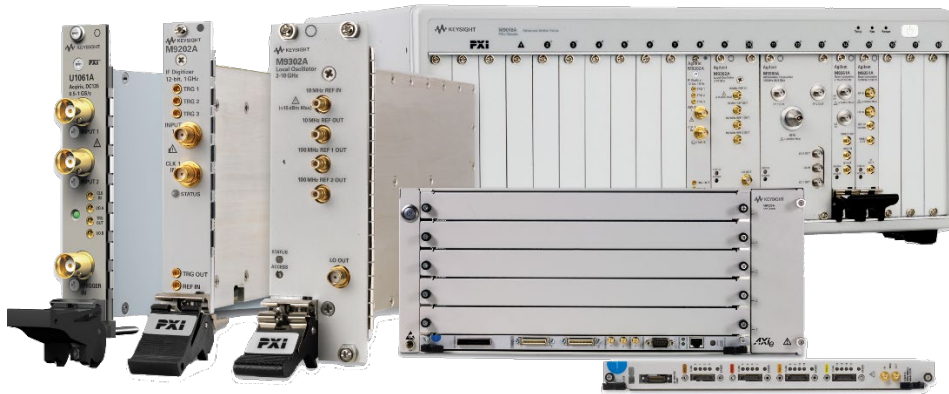
www.keysight.com/find/awg

The M8190A arbitrary waveform generator

- 14 bit at 8 GSa/s
- 12 bit at 12 GSa/s
- Up to 80 dBc SFDR.
- 2 GSa memory per channel.
- 5 GHz analog bandwidth.

Modular instruments

Keysight offers modular RF, switching and data acquisition solutions that are easily expandable and reconfigurable.

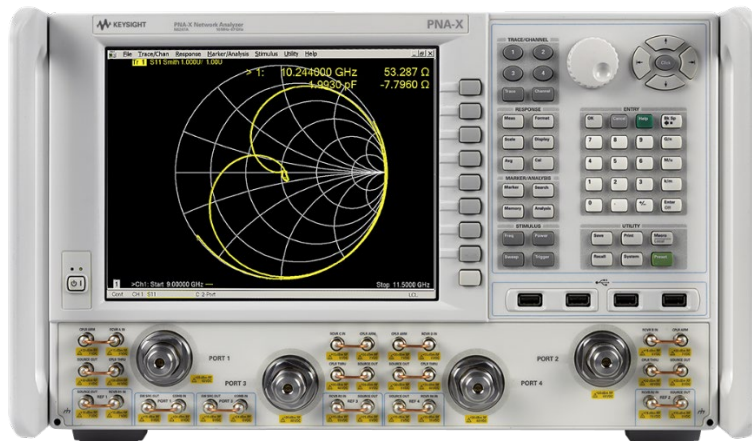www.keysight.com/find/modular

New configurable modular instruments in PXI and AXIe formats

- Modular and synthetic instruments available in PXI, AXIe, VXI, LXI and USB formats
- Get the best value in high quality switching and measurements in compact, cost-effective solutions
- Industry standard software drivers and support for multiple development platforms including Microsoft Visual Studio, LabView, MATLAB and VEE.

Network analyzers

From 10 Hz to 1 THz, RF and microwave network analyzers fit your needs for S-parameters, X-parameters, balanced parameters, conversion loss/gain, gain and phase compression, intermodulation distortion, and noise figure. PNA-X network analyzers provide a broad range of measurements with a single set of connections to the DUT.
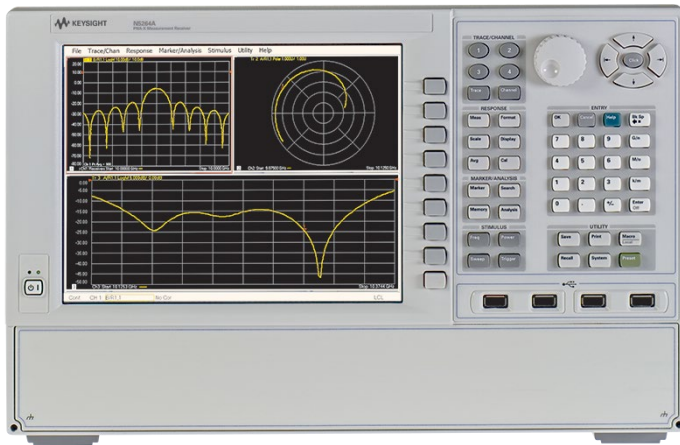
www.keysight.com/find/na

Keysight provides the premier network analyzers in the market, ranging from handheld models to mm-wave instruments.

- Industry's widest range of measurement applications with a single connection
- Up to 144 dB dynamic range
- Output power as high as +22 dBm

Antenna test

Keysight offers antenna test systems with breakthrough performance and backwards compatibility with existing 8510/8530-based installations. Keysight also provides the signal sources and accessories you need to complete your antenna test system.
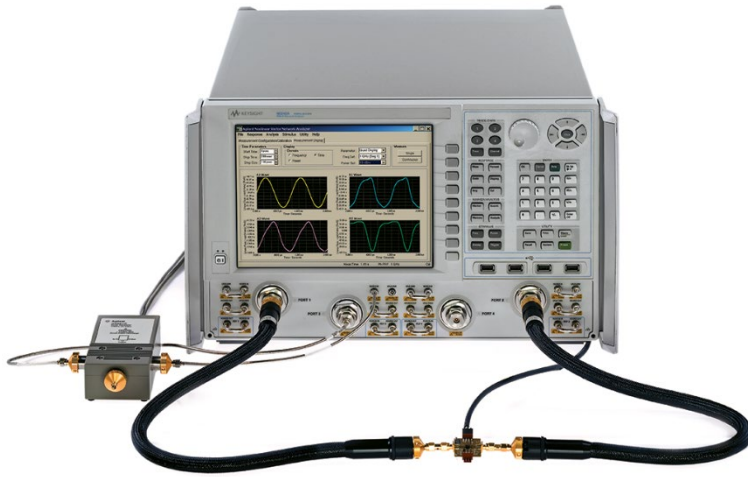
www.keysight.com/find/antenna

The N5264A sets a new industry standard for antenna test.

- Up to 400,000 points per second data acquisition simultaneously on five receiver channels
- Built-in 8510/8530 code emulation for drop-in replacement in existing antenna ranges
- Optional built-in 26.5 GHz LO source with +10 dBm output power

Nonlinear Vector Network Analyzer (NVNA)

Built on the powerful PNA-X, the NVNA provides nonlinear measurements and models for components such as amplifiers and transistors. Create measurement-based X-parameters with the NVNA to simulate linear and nonlinear behavior of components and systems using Keysight's Advanced Design System (ADS) software.
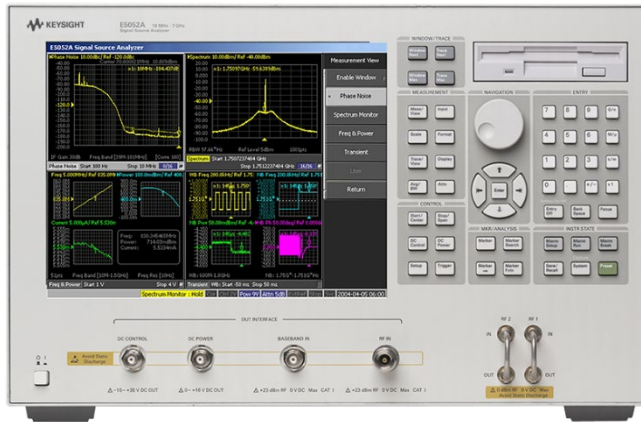
www.keysight.com/find/nvna

4-port PNA-X network analyzer with NVNA software

- Measure amplitude and phase of spectral components in and out of the DUT, yielding waveforms traceable to the National Institute of Standards and Technology (NIST)
- Use X-parameters to predict nonlinear system behavior of cascaded components in mismatched environments
- Easily import X-parameters into Keysight's ADS for fast, accurate nonlinear simulation and design

Signal source analyzer

The E5052B signal source analyzer offers high measurement accuracy and the world's highest throughput and best usability for characterizing VCOs or other types of high frequency signal sources from 10 Hz to 110 GHz, with analysis offsets of 1 Hz to 100 MHz.
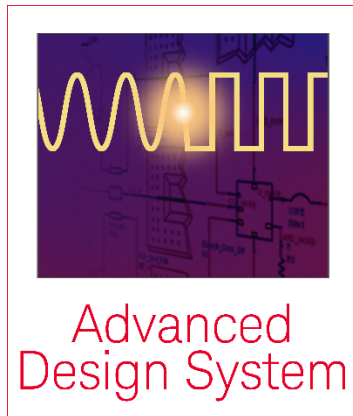
www.keysight.com/find/ssa

The E5052B SSA provides complete RF VCO characterization with a single instrument

- Provides AM noise and phase noise measurements with single RF connection
- Spectrum monitoring up to 15 MHz span in real-time mode
- Simultaneous transient measurements for frequency, phase and power versus time

Advanced Design System (ADS) high-frequency and high-speed design platform

ADS provides a complete, integrated set of accurate and easy-to-use system, circuit and EM simulators to enable first-pass design success in a complete desktop flow.

www.keysight.com/find/ADS

The leading RF & microwave physical design and verification software for radar and satellite communication applications

- Complete schematic capture and layout environment
- Multi-technology design allows multiple IC's combined with laminate and packaging PCB to all be designed together
- Integrated 3D multi-layer planar EM and full 3D FEM simulation for physical design and verification.
- X-parameter simulation and generation for accurate nonlinear circuit and system behavioral modeling design and verification

SYSTEMVUE Electronic System-Level (ESL) design software

SystemVue enables system architects and algorithm developers to design next-generation systems by providing RF model fidelity, wireless reference standards and real measurements into the world baseband DSP, accelerating system-level design and verification.

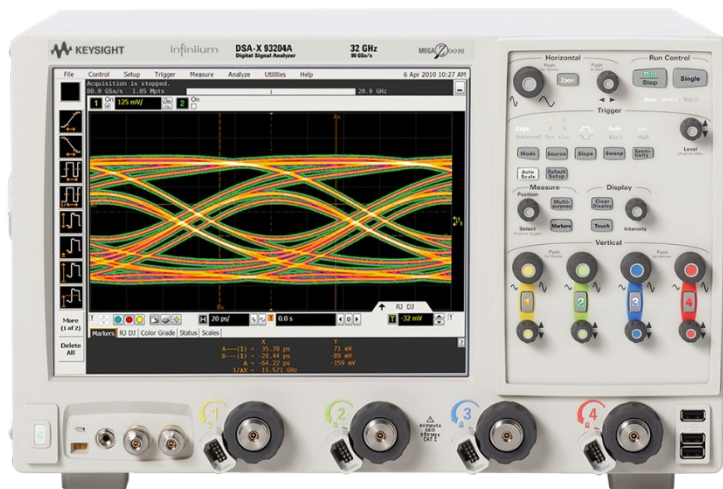www.keysight.com/find/SystemVue

The W1905 Radar Model Library saves development time and verification expense in R&D for radar system architects, algorithm developers, and system verifiers.

- Over 60 simulation blocks and reference designs to create radar system scenarios, processing blocks, clutter, targets, and hardware measurements.
- Supports pulsed-doppler ultra-wide band, digital arrays, beamforming, and frequency modulated continuous-wave (FMCW).

Oscilloscopes

Keysight offers a complete line of oscilloscopes optimized to your test needs, from handheld units to high-performance oscilloscopes with bandwidths to 32 GHz and mixed signal scopes that provide both analog and digital channels.
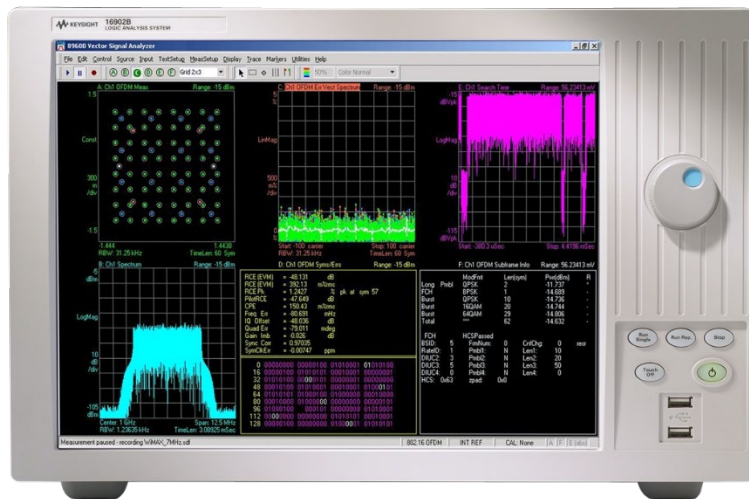
www.keysight.com/find/scope

Keysight oscilloscopes with bandwidths to 32 GHz

- Models up to 32 GHz and 80 GSa/sec with 4 channels
- Up to 2 Gpts memory
- Industry's lowest oscilloscope noise floor

Logic analyzers

Keysight offers a comprehensive family of logic analyzer products to perform system-level digital debug and address SDR measurement challenges with advanced probing solutions, measurement modules and analysis tools providing you the most complete view of system behavior.
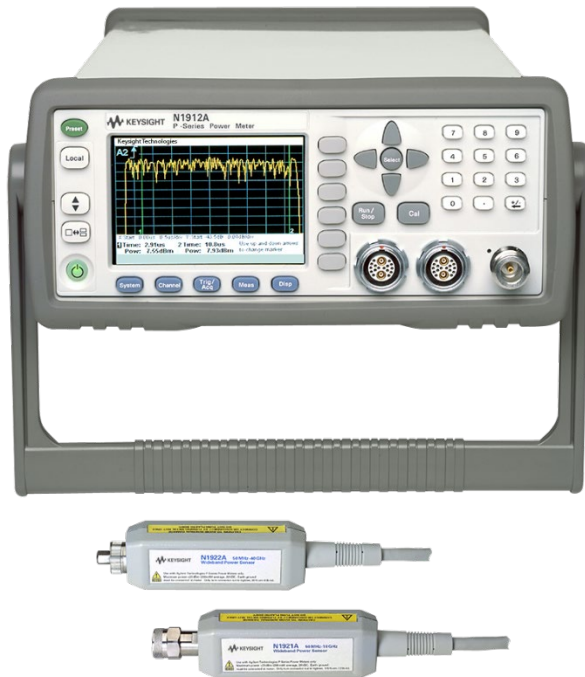
www.keysight.com/find/logic

Keysight provides the highest performance logic analyzers in the industry, ranging from portable to modular instruments.

- Up to 4 Gb/s state data rate
- Up to 8 GHz timing
- Up to 256 M samples per channel
- From 34 channels up to hundreds of channels

Power meters and sensors

Keysight power meters operate with CW, average and peak and average sensors covering numerous frequency and power ranges to accurately measure the power of RF and microwave signals.

www.keysight.com/find/powermeters

Keysight's power meters/sensors are the industry standard for RF and microwave power measurements

- Bench and handheld peak and average power meters
- Power meter and computer controlled (USB) power sensors
- Sensors from --70 to +44 dBm and frequency coverage from 9 kHz to 110 GHz

Power supplies and loads

Our broad selection of bench-friendly and system-ready power supplies can meet your testing challenges—from basic to complex —with a wealth of available capabilities.

www.keysight.com/find/power

Choose from a broad selection of bench and system-ready supplies

- DC power supplies: single and multiple output to 6600 W
- DC electronic loads: single and multiple input from 150 W to 600 W
- Solar array simulators for accurate simulation of any type of solar array: scalable, modular systems ranging from 600 W to tens of kWs

Other Products for Aerospace and Defense Test Applications

Digital multimeters

The world's most trusted DMMs, hand-held, modular, and bench models to 8½ digits.

https://www.keysight.com/us/en/products/digital-multimeters-dmm.html

High resolution and USB digitizers

High-speed, high-resolution digitizers in modular, LXI and USB versions allow you to capture your data without compromise.

www.keysight.com/find/digitizers

Frequency counters

10 and 12 digits/s frequency counters; microwave models up to 46 GHz including high-stability options.

www.keysight.com/find/counter

34972A/34980A data acquisition and switching

34972A LXI Data Acquisition collects data without programming. 34980A offers more channels and greater flexibility.

https://www.keysight.com/us/en/products/modular/data-acquisition-daq.html

U2300A family of data acquisition products

Data loggers and data acquisition products have flexible measurement capabilities with modular acquisition cards.

https://www.keysight.com/us/en/products/modular/data-acquisition-daq.html

Handheld products

Keysight now offers rugged, portable network analyzers, spectrum analyzers, cable testers, oscilloscopes and multimeters

https://www.keysight.com/us/en/products/digital-multimeters-dmm.html

RF and microwave test accessories

Choose from over 200 accessories (including microwave switches, attenuators, amplifiers, more), DC to 67 GHz, that provide superior RF performance to complete your test systems.

www.keysight.com/find/mta

Protocol analyzer and exerciser

Digital Test Console, a complete and integrated PCIe Test Solution—supporting all speeds of PCIe.

www.keysight.com/find/protocol

8990B peak power analyzer

The Keysight 8990B peak power analyzer provides complete and accurate characterization of today's complex pulsed signals with a frequency range of 50 MHz to 40 GHz.

www.keysight.com/find/peakpoweranalyzer

N9038A MXE EMI receiver

CISPR 16-1-1 compliant receiver providing both radiated and conducted EMI tests.

www.keysight.com/find/MXE

Helping You Keep Pace with New Technologies

You can count on us to provide you with leading-edge test solutions when you need them. We'll help you take advantage of Keysight innovations such as nonlinear vector network analysis and X-parameters that provide critical, detailed information about nonlinear device behavior.

Developing the Products and Services You Need

Keysight has been providing the Aerospace and Defense industries with products and services for nearly 70 years, so we understand and develop COTS products tuned to your needs. Here are just a few examples of how Keysight products meet your requirements:

Technology refresh services

Whether you are migrating to a new technology, extending the life of an existing system or developing a new program, Keysight has services and solutions to assist you in refreshing your existing test and measurement applications.

Test system development: Hire Keysight to refurbish or develop code-compatible replacement systems or subsystems. Instrument migration and planning services: Use Keysight consultants to evaluate your aging test applications and help develop a migration strategy.

Traceable standards and standards-based calibration

Keysight instruments are built to NIST, NPL and JEMIC traceable standards. Our quality system includes ISO 9001:2000 and ANSI Z540-1-1994 certification as well as ISO / IEC 17025 Compliance and Accreditation. Our service centers include 28 ISO 17025 Accredited Laboratories across the world.

Instrument security features

Many Keysight instruments have been designed with security requirements such as removable storage subsystems. The ability to remove user data and state or usage information enables you to remove your information and keep it in a secure area. Memory scrubbing/cleaning procedures are also available for many instruments. To find the security procedures for your product, visit www.keysight.com/find/security

Instrument and code compatibility

Most instruments provide code compatibility modes to take advantage of new capabilities. Some instruments provide instructions or modes that emulate special setups commonly used in previous models. When drop-in compatibility is not possible, Keysight may be able to provide a test code conversion service.

www.keysight.com/find/techrefresh

Procuring and managing your assets

Financing solutions: Simplify the management of your assets with flexible rental, leasing and finance terms through Keysight and our partners.

Trade in program: Utilize Keysight's trade-in program to update, migrate or dispose of aging assets.

Turnkey and custom test systems

When you want help building an ATE system or require a turnkey test system, Keysight's Aerospace and Defense KDE Systems Team (KDETEST) and our partners can help. KDETEST offers specialized consultant engineers who deliver integrated, customized, and comprehensive test and measurement solutions tailored to meet the requirements of the A/D community.

For more information, visit www.keysight.com/find/adsystems

or contact your local Keysight representative.

To contact a Keysight solution partner, visit www.keysight.com/find/channelpartner

KEYSIGHT