Keysight & Our Distributor Network

RIGHT *Instrument.* RIGHT *Expertise.*
Delivered RIGHT *Now.*

Keysight Technologies
Distribution Products Catalog

March 2020

KEYSIGHT TECHNOLOGIES

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Keysight & Our Distributor Network

RIGHT *Instrument.* **RIGHT** *Expertise.*
Delivered **RIGHT** *Now.*

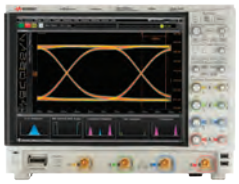
Keysight and our network of Keysight Authorized Distributors have teamed up to provide fast, easy access to the world's largest selection of off-the-shelf T&M instruments. It's the best of both worlds: Keysight's measurement expertise and product breadth combined with speed, convenience and same-day shipping from our distribution partners.

It's never been easier to get the right instrument in the right hands, right away.

To find a Keysight Authorized Distributor nearest you visit www.keysight.com/find/distributors

What's New

S-Series Oscilloscopes



The S-Series oscilloscopes provides a superior time base, front-end and ADC technology blocks with 16 bits of resolution, low noise, low jitter and high ENOB for a clear view of your device's performance.

- 10-bit ADC up to 8 GHz for additional resolution
- Selection of application specific options

See page 12

http://www.keysight.com/find/s-series

InfiniiVision 1000 X-Series Oscilloscopes

- Four new 2-channel oscilloscope models include increased bandwidth, increased memory, faster waveform update rates, standard LAN, and standard serial bus analysis capabilities.
- Improvements, such as serial bus analysis, now standard for the current 4-channels models

See page 7

www.keysight.com/find/1000X-Series

DAQ970/73A Data Acquisition Systems

Step up performance from the 34970/72A, 3-slot data acquisition units, with the DAQ970/73A which provides improved measurement accuracy, wider resistance measurement range and 100 times faster reading rates.

- 50, 000 readings/s
- 9 switch, RF, digitzer, and control plug-in modules
- USB, LAN and GPIB interface

See page 21

www.keysight.com/find/DAQ973A

4430 Series 4-port Microwave ECal

Perfect for use with Keysight's RF balanced measurement solutions

- Fast calibrations that are extremely repeatable and accurate

See page 35

www.keysight.com/find/ecal

BenchVue Software: Control. Automate. Simplify.

Keysight BenchVue software for PC eliminates the many of the issues around bench testing. By making it simple to connect, control instruments, and automate test sequences you can quickly move past the test development phase and access results faster than ever before. Dedicated instrument apps allow you to quickly configure the most commonly used measurements and setups for each instrument family. Rapidly build custom test sequences with the integrated Test Flow app to automate and visualize test results without the need for instrument programming. A variety of powerful BenchVue apps enable you to significantly reduce test development time.

NEW Lab management apps provide centralized lab instrument configuration, track assets, and lab administration.

Use BenchVue apps to:

- Configure the most commonly used controls and measurements from your Keysight instruments
- Visualize multiple measurements simultaneously
- Easily log and export data and screen images in just a few clicks for faster analysis
- Create automated test sequences fast with minimal instrument knowledge
- Centrally manage and configure lab stations

Look For This Icon

throughout the catalog to identify products with BenchVue software included or supported.

BenchVue software supports over 500 Keysight instruments including digital multimeters, power supplies, function/waveform generators, spectrum analyzers, data acquisition units, network analyzers, oscilloscopes, power meters, power sensors, electronic loads, universal counters and more — look for the BenchVue supported icon for compatible products.

Start accelerating your workflow today. BenchVue apps are included with most products in this catalog.
Visit www.keysight.com/find/lms for details.

Remotely control your bench instruments

Configure BenchVue to remotely monitor and control bench instruments from a different location. This allows remote teaching/learning labs to be monitored by a teacher or for engineers to remotely control systems across the world.

Using BenchVue to Remotely Control Bench Instruments

DOWNLOAD YOUR NEXT INSIGHT

Keysight software is downloadable expertise. From first simulation through first customer shipment, we deliver the tools your team needs to accelerate from data to information to actionable insight.

Learn more at www.keysight.com/find/software

Curriculum-based teaching solutions and lab management software

U3800 Series Internet of Things (IoT) Teaching Solutions

- The U3800 Series IoT Applied Courseware offers a comprehensive ready-to-teach package, focusing on learning the IoT system and end-user applications through case studies, practical labs and industrial assignments.
- Topics include: Smart Home Automation, Smart City, Smart Automobile, Disaster Management, Industry 4.0 Automation, and Wireless Communication.
- Includes IoT fundamentals through wireless communication, sensors and power management providing students with practical design and test techniques using leading edge tools

Learn more at www.keysight.com/find/teaching-solutions

U3851A RF Microwave Teaching Solution

- RF Microwave circuit design, simulation and measurement courseware, 5G NR ne
- Brings industry design experience into the classroom and covers the complete design flow to successfully develop 5G and IoT wireless application
- Courseware includes a modular prototype kit using a 1.8 GHz receiver module, lab sheets and problem-based assignments for use with recommended instruments and design software

Learn more at www.keysight.com/find/u3851a

BV9111B BenchVue Lab Management and Control Solution

- BenchVue Lab is a LAN-based lab management solution, providing centralized instrument configuration lab overview and asset tracking for educators teaching labs.
- Includes Keysight BV011xB BenchVue Lab apps (instrument control, automation and analysis) and the BV9101B BenchVue education control collection.
- Easy instrument control, data capture, data logging, monitoring and report generation for test bench students

Learn more at www.keysight.com/find/lms

The Keysight Essential Bench

The deepest bench in the industry

Only Keysight delivers the industry's largest selection of bench instruments and groundbreaking BenchVue software — the zero-programming way to view, capture, and export the data you collect from your bench. To see the full portfolio of essential bench products offered by Keysight Authorized Distributors, visit: www.keysight.com/find/essentialbench

1. BenchVue software

Capture, visualize, and share data from multiple instruments with no need for programming.
See page 3

2. Oscilloscopes

See more of your signals and solve your toughest challenges with innovative scope technology.
See pages 6-13

3. Power supplies

Enable faster, safer testing with built-in measurements, battery drain analysis/characterization, full DUT protection, and output sequencing.
See pages 36-41

4. Function/arbitrary waveform generators

Validate the most challenging designs with True*form* arbitrary waveforms, modulation, and two-channel synchronization.
See pages 18-19

5. Data acquisition/switch units

Simplify ad hoc testing with temperature and electrical signal measurement flexibility, universal channels, and no external signal conditioning.
See pages 20-21

6. Frequency counters/timers

Expand your measurement and analysis capabilities with histograms, trend/strip charts, statistics, data logging, and more.
See page 17

7. Digital multimeters (DMMs)

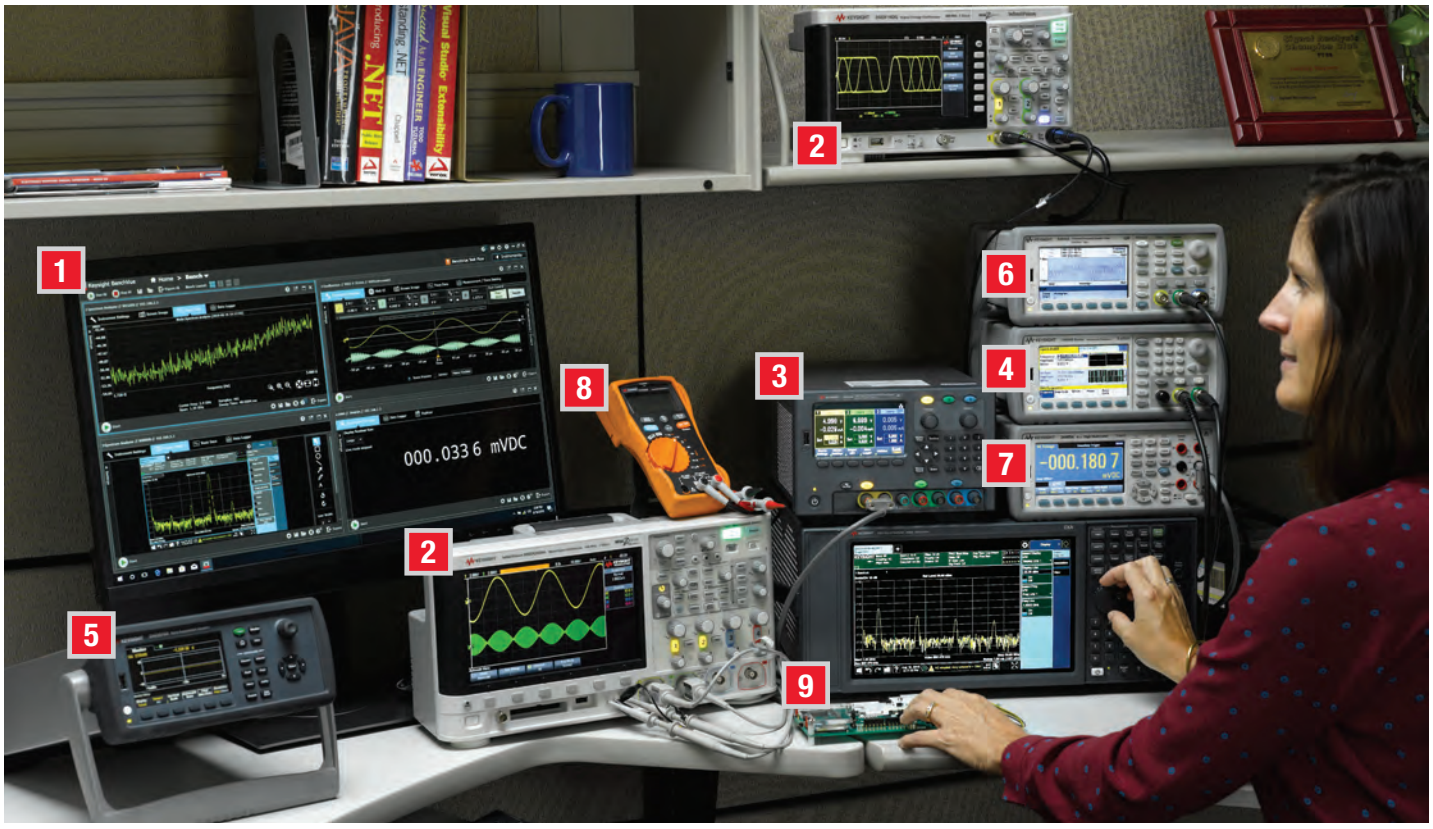
Capture measurements quickly with graphical displays, on-screen analysis, and auto calibration.
See pages 14-15

8. Handheld instruments

Handle a wider range of challenges with thermal image temperature measurements and fully featured multimeters with frequency counters, square waves, and wireless connectivity.
See pages 24-27

9. Spectrum/signal analyzers

Value-priced, general-purpose spectrum anaylsis.
See pages 28-29

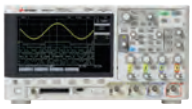
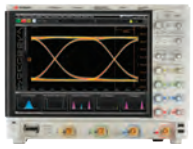


Digital Storage (DSO) and Mixed Signal (MSO) Oscilloscopes

Get products to market faster. Keysight's award-winning oscilloscopes provide the fastest update rates, capacitive touch screen, and the most software options.

Produce the highest-performing products. Keysight's scopes make measurements you can trust, thanks to industry-leading signal integrity and the largest selection of oscilloscope probes.

Achieve the lowest cost of ownership. Keysight's oscilloscopes let you integrate several instruments in one mainframe and easily upgrade.

	1000 X-Series	2000 X-Series [1]	3000 X-Series	4000 X-Series	6000 X-Series	S-Series
						
Bandwidth	50 to 200 MHz	70 to 200 MHz	100 MHz to 1 GHz	200 MHz to 1.5 GHz	1 GHz to 6 GHz	500 MHz to 8 GHz
Memory (Max)	2 Mpts	1 Mpts	4 Mpts	4 Mpts	4 Mpts	800 Mpts
Sample rate (Max)	2 GSa/s	2 GSa/s	5 GSa/s	5 GSa/s	20 GSa/s	20 GSa/s
Channels	2 or 4 analog	2 or 4 analog + 8 digital [2]	2 or 4 analog + 16 digital [2]	2 or 4 analog + 16 digital [2]	2 or 4 analog + 16 digital [2]	2 or 4 analog + 16 digital [3]
Display	7.0"	8.5"	8.5" capacitive touch	12.1" capacitive touch	12.1" capacitive touch	15"
Update rate	200,000 wfms/s on DSO models	200,000 wfms/s	1,000,000 wfms/s	1,000,000 wfms/s	450,000 wfms/s	2,500 wfms/s
Touch zone triggering	—	—	Yes	Yes	Yes	Yes
Instrument integration	FRA (Bode plot) 5-digit counter 3-digit DVM 20 MHz WaveGen Protocol analyzer	5-digit counter 3-digit DVM 20 MHz Function Gen Protocol analyzer	FRA (Bode plot) 8-digit counter 3-digit DVM 20 MHz AWG Protocol analyzer	FRA (Bode plot) 5-digit counter 3-digit DVM 20 MHz dual AWG Protocol analyzer	FRA (Bode plot) 10-digit counter 3-digit DVM 20 MHz dual AWG Protocol analyzer	Protocol Analyzer Logic Analyzer Compliance Test

1. 2000X specifications for models manufactured after March 5, 2018, older models can be upgraded using DSOX2PLUS option.
2. +8 or +16 digital channels on mixed-signal oscilloscope models or DSO-to-MSO upgrade kits.
3. MSO models only, include 16 digital channels

InfiniiVision USB oscilloscopes, P9241/42/43A, See page 22 for details.

InfiniiVision 1000 X-Series 50 to 200 MHz

Get measurements you can count on to create the designs that will change the future. The 1000 X-Series leverages the same proven technology used in higher-end InfiniiVision family, giving you professional-level measurements you can trust. Now you can get even more functionality with capabilities like 4-wire SPI decode and remote connection via LAN. Get the performance you need to measure with confidence.

- Fast 200,000 waveforms/second update rate enhances signal visibility
- Key features for education customers: Keysight exclusive Bode plot display (FRA), integrated waveform generator, free education kit, online help, standard 10:1/1:1 switchable passive probes
- Enhanced usability with BenchVue software to quickly capture and log measurement data, get screen images, and traces for insight into your test challenges
- Standard serial protocol analysis and trigger on all models

www.keysight.com/find/1000X-Series

Model series	Bandwidth (–3 dB)	Input channels	Sampling rate	Memory depth	Waveform update rate	Standard	Built-in WaveGen
EDUX1052A	50 MHz	2	1 GSa/s	200 Kpts	100,000 wfms/s	I^2C and UART/RS232	No
EDUX1052G							Yes
DSOX1202A	70 MHz, upgradeable to 100 MHz		2 GSa/s	2 Mpts	200,000 wfms/s	I^2C, SPI, UART/RS232, CAN, and LIN	No
DSOX1202G							Yes
DSOX1204A	70 MHz, upgradeable to 100 and 200 MHz	4					No
DSOX1204G							Yes

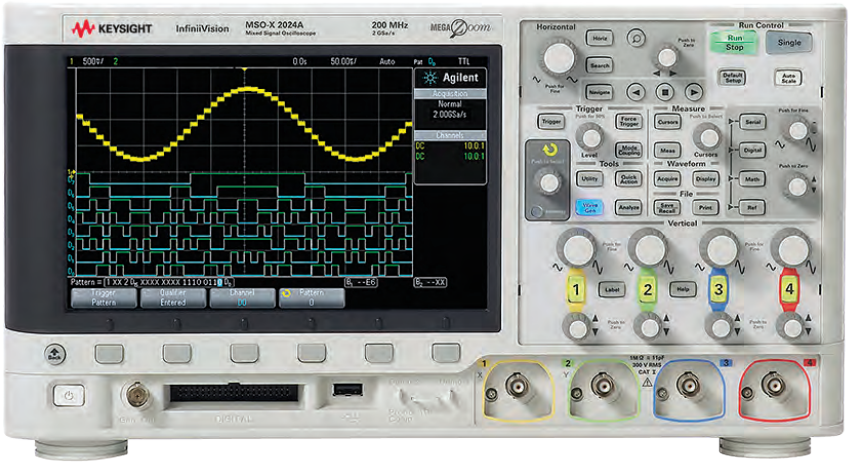
Standard LAN connection now available on all models

InfiniiVision 2000 X-Series oscilloscopes

Breakthrough technology delivers more scope for the same budget

- 70 to 200 MHz economy scopes
- Hardware based mask testing as well as serial protocol trigger and decode for I^2C, SPI, RS-232/UART, CAN, LIN
- Fully upgradeable: add bandwidth, digital channels, serial protocol trigger and decodes, measurement applications and WaveGen
- 5-year standard warranty

www.keysight.com/find/2000X-Series



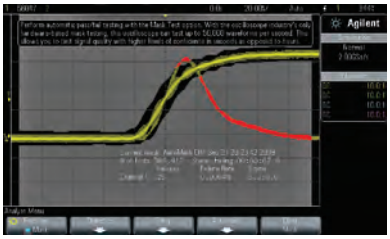
LXI

Display

- High resolution 8.5" display
- Up to 200,000 wfms/s update rate
- Fast, responsive MegaZoom IV memory, 1 Mpts

5 instruments in 1

- Best-in-class oscilloscope
- Built-in WaveGen 20 MHz function generator with modulation capability (optional)
- Serial/protocol options



Investment protection, upgradeable

- Bandwidth upgradeable
- MSO with integrated digital timing channels
- 3-digit digital voltmeter (optional)

Model series [1]	Bandwidth (–3 dB)	Input channels DSOX	Input channels MSOX	Sampling rate	Memory depth	Waveform update rate
2002A	70 MHz	2	2 + 8	2 GSa/s	1 Mpts	200,000 wfms/s
2004A		4	4 + 8			
2012A	100 MHz	2	2 + 8			
2014A		4	4 + 8			
2022A	200 MHz	2	2 + 8			
2024A		4	4 + 8			

1. 2000X specifications for models manufactured after January 1, 2018, older models can be upgraded using DSOX2PLUS option.

InfiniiVision 3000T X-Series oscilloscopes

Touch, discover, solve

- 100 MHz to 1 GHz digital storage and mixed signal scopes
- Standard Zone touch triggering
- Mixed domain analysis with time/frequency measurement correlation
- 20 MHz built-in WaveGen function/arbitrary generator with modulation capability
- Fully upgradeable: add bandwidth, digital channels, measurement applications, DVM, counter or WaveGen any time customer installable
- Calibration period of 3 years

www.keysight.com/find/3000TX-Series

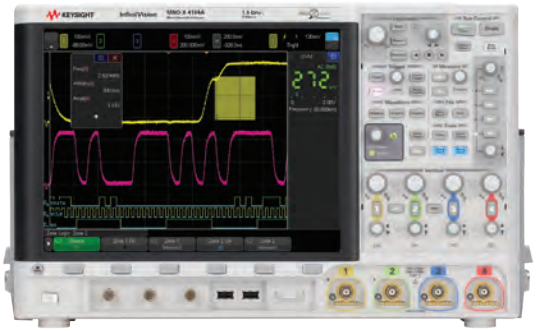
LXI

InfiniiVision 4000 X-Series oscilloscopes

Oscilloscope experience redefined

- 200 MHz to 1.5 GHz digital storage and mixed signal scopes
- 12.1-inch capacitive touch display
- Standard Zone touch triggering with up to 1,000,000 waveform updates/second update rate
- Built-in dual channel 20 MHz WaveGen function/arbitrary generator with modulation capability

www.keysight.com/find/4000X-Series



LXI

Model series	Bandwidth (–3 dB)	Input channels DSOX	Input channels MSOX	Sampling rate	Memory depth	Display size and type	Waveform update rate	Calculated rise time (10 to 90%)
3012T	100 MHz	2	2 + 16	5 GSa/s half channel, 2.5 GSa/s all channel	Standard 4 Mpts, standard segment memory	8.5-inch capacitive touch display with standard zone trigger	> 1 million wfms/s	≤ 3.5 ns
3014T		4	4 + 16					
3022T	200 MHz	2	2 + 16					≤ 1.75 ns
3024T		4	4 + 16					
3032T	350 MHz	2	2 + 16					≤ 1 ns
3034T		4	4 + 16					
3052T	500 MHz	2	2 + 16					≤ 700 ps
3054T		4	4 + 16					
3102T	1 GHz	2	2 + 16					≤ 450 ps
3104T		4	4 + 16					
4022A	200 MHz	2	2 + 16			12.1-inch high-definition capacitive touch display		≤ 1.75 ns
4024A		4	4 + 16					
4032A	350 MHz	2	2 + 16					≤ 1 ns
4034A		4	4 + 16					
4052A	500 MHz	2	2 + 16					≤ 700 ps
4054A		4	4 + 16					
4104A	1 GHz	4	4 + 16					≤ 450 ps
4154A	1.5 GHz [1]	4	4 + 16					≤ 300 ps

1. 1.5 GHz real-time bandwidth in half-channel mode or full-channel equivalent time mode.

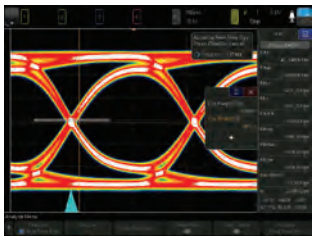
InfiniiVision 6000 X-Series oscilloscopes

The new standard in price performance

- 1 to 6 GHz digital storage and mixed signal scopes
- 12.1-inch capacitive multi-touch screen with Zone touch trigger
- Superior noise floor and waveform update rate
- Standard histogram and color grade, plus enhanced color FFT
- Optional jitter and real-time eye-diagram analysis
- Voice control in 14 languages

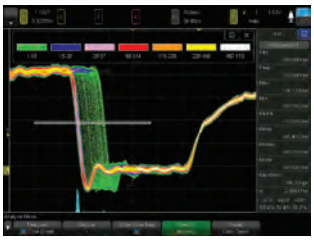
www.keysight.com/find/6000X-Series

LXI



Bandwidth standard

- Performance meets price: two opposing concepts meet in a portable 6-GHz oscilloscope



New visualization standard

- Quickly troubleshoot your design by visualizing your challenges

Integration standard

- Get the power of 6 instruments in 1, fully upgradeable

Model series	Bandwidth (–3 dB)	Input Channels DSOX	Input Channels MSOX	Sampling rate	Memory depth	Display size and type	Waveform update rate
6002A	1 to 6 GHz	2	2 + 16	20 GSa/s	4 Mpts	12.1-inch capacitive multi-touch screen, Hardware InfiniiScan Zone touch trigger	450,000 wfms/s [1]
6004A		4	4 + 16				

1. DSO only.

Applications — Engineered to Turn Measurements into Answers

You need fast, accurate answers to your measurement questions. That's why Keysight offers the broadest selection of compliance and debugging applications in the industry. Keysight applications work with your oscilloscope to quickly and easily provide exceptional insight into your signals.

Add additional functionality

Instantly integrate instruments or upgrade your scope's functionality

The Education Training Kit and built-in DVM are now standard on all InfiniiVision oscilloscopes.

Applications	1000 X-Series	2000 X-Series	3000T X-Series	4000 X-Series	6000 X-Series	P924xA
WaveGen function generator	Standard on G models	DSOX-2WAVEGEN				
WaveGen arbitrary/function generator			DSOX-3WAVEGEN	DSOX-4WAVEGEN2	DSOX-6WAVEGEN2	P9240AWGA
Frequency Response Analysis (FRA)	Standard on G models	Included with any software option[1]				
DSO to MSO upgrade kit		DSOX2MSO	DSOXT3MSO	DSOXPERFMSO	DSOX6MSO	

[1] Excluding the NFC software option.

Debug your designs faster

Industry-specific software options

Applications	1000 X-Series	2000 X-Series	3000T X-Series	4000 X-Series	6000 X-Series	P924xA[2]
Automotive	Standard[1]	D2000AUTA	D3000AUTA	D4000AUTA	D6000AUTA	P9240AUTB
Aerospace & Defense			D3000AERA	D4000AERA	D6000AERA	P9240AERB
Embedded	Standard	D2000GENA	D3000GENA	D4000GENA	D6000GENA	P9240GENB
Power			D3000PWRA	D4000PWRA	D6000PWRA	
USB				D4000USBA	D6000USBA	
NFC			D3000NFCA	D4000NFCA		P9240NFCB
Ultimate Bundle		D2000BDLA	D3000BDLA	D4000BDLA	D6000BDLA	P9240BDLB

[1] DSO models only [2] Refer to page 22 for P924xA oscilloscopes

Simplify your job

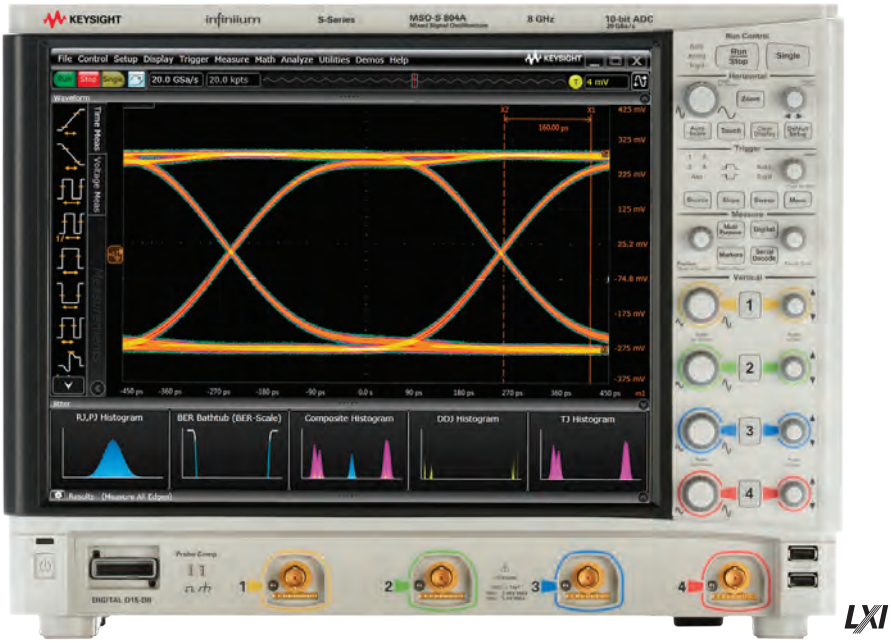
PC-based software, limit testing and segmented memory all help organize your data

Applications	1000 X-Series	2000 X-Series	3000T X-Series	4000 X-Series	6000 X-Series
Mask/waveform limit testing	Standard on DSO models	■	■	■	■
Segmented memory	Standard on DSO models	Standard	Standard	Standard	Standard
Infiniium Offline PC-based analysis software	■	■	■	■	■
BenchVue software included	√	√	√	√	√
Software application bundle		■	■	■	■
Jitter					■

NEW Infiniium S-Series oscilloscopes

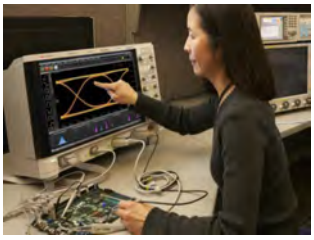
- 10-bit ADC up to 8 GHz for additional resolution
- Low-noise front end and RF capability
- Dedicated software/probes for Power Integrity and Signal Integrity test
- Advanced jitter measurements
- Supports many probe technologies

www.keysight.com/find/s-series



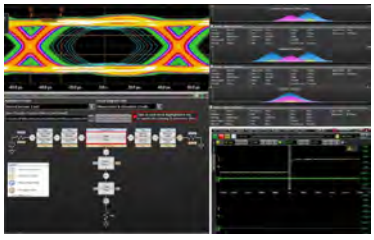
Connect

- Support for >100 probes – current and voltage, active and passive, 1 MΩ and 50 Ω inputs



Discover

- Low noise front end for precision signal viewing
- Powerful, flexible Infiniium user interface



Solve

- 150+ measurement and applications
- Powerful RF capability
- Offline GUI for remote test

DSO/MSO models	Bandwidth	Channels	Sampling rate	Memory depth	Display size and type	Vertical resolution
S054A	50 Ω 500 MHz 100 Ω 500 MHz	DSO: 4 analog MSO: 4 analog, 16 digital	20 GSa/s on 2 channels, 10 GSa/s on 4 channels	100 Mpt (standard) Option up to 800 Mpts (2 channel)	15" XGA capacitive Touchscreen, VGA and Display Port for external monitors	10 bits at full bandwidth Up to 16 bits in high resolution
S104A	1 GHz					
S204A	2 GHz					
S254A	2.5 GHz					
S404A	4 GHz					
S604A	6 GHz [1]					
S804A	8 GHz [1]					

[1] Bandwidth is for 2 channels. Bandwidth for 4 channels is 4 GHz.

Probes — Engineered for Signal Access and Measurement Accuracy

To get top performance from your scope, you need the right probe for your application. Keysight offers a broad selection.

N7026A Clamp-on current probe and N7040/1/2A Rogowski AC current probe

Accurate measurements in tight spots

- Measure wide bandwidths
- Probe down to 1 mA/div with the high sensitivity clamp-on current probe
- Measure up to 3,000 A_{pk} of AC current with the new Rogowski coil probe

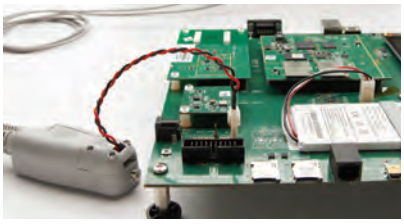
www.keysight.com/find/N7026A | www.keysight.com/find/N7040A

N2820A and N2821A high sensitivity current probes

See the big picture without losing sight of the details

- Ideal for measuring current consumption of battery-powered devices or integrated circuits
- Measure AC and DC currents as low as 50 µA, and as high as 5 A
- Also use as a voltage probe to achieve as low as 3 µV sensitivity
- Bandwidth; 3 MHz Zoom-Out Channel, 500 kHz Zoom-In Channel

www.keysight.com/find/N2820A



N7020A power rail probe

Industry's most accurate view of DC power rail behavior up to 2 GHz

- 2 GHz single-ended active probe for power rail noise measurements
- 16x less noise than a conventional 1:1 differential probe
- Low DC loading with input impedance of 50 kΩ
- Large offset range (±24 V) enables use of a scope's max vertical sensitivity

www.keysight.com/find/N7020A

	1000 X-Series	2000 X-Series	3000T X-Series	4000 X-Series	6000 X-Series
Scope bandwidth	50 to 200 MHz	70 to 200 MHz	100 MHz to 1 GHz	200 MHz to 1.5 GHz	1 to 6 GHz
Probe interface	BNC	BNC	AutoProbe Lite	AutoProbe	
Standard probe (scope bandwidth)	N2140A (70 MHz/100 MHz) N2142A (50 MHz)	N2841A (70 MHz/100 MHz) N2842A (200 MHz)	N2843A (all)	N2894A (all)	
Passive probe 1:1	N2140A/ N2142A	10070D, N2870A			
10:1	N2140A/ N2142A	N2841A, N2842A, N7007A	N2841A, N2842A, N2890A, N2871A, N7007A	N2894A, N7007A	
High-voltage passive probe 100:1	10076C				
Low Z passive probe	—	—	N2874A, N2876A		
Active differential probes (high speed)	—	—	N2750A, 1130B[1]		N2750A/51A/52A, 1130B/31B/32B[1]
(high voltage)	N2791A, N2891A	N2791A, N2891A	N2790A/91A/92A/93A, N2818A/19A, N2891A, N2804A/05A		
Active single-ended probe	—	—	N2795A/96A/97A	N2795A/96A/97A, N7020A	N2795A/96A/97A
Current probe	1146B, N2780B/81B/82B/83B[2], N7040A/41A/42A	1146B, N2780B/81B/82B/83B[2], N7040A/41A/42A	1146B, 1147B, N2893A, N2780B/81B/82B/83B[2], N2820A/21A , N7026A, N7040A/41A/42A		

1. Order one or more InfiniiMax. Probe heads or connectivity kits required per amplifier model shown.
2. Requires N2779A power supply.

True*volt* Digital Multimeters

Lower DC current ranges and faster reading rates, allows enhanced measurements

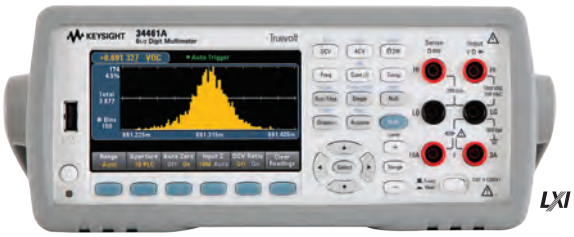
Get more details quickly. True*volt* digital multimeters (DMMs) graphical capabilities, such as trend and histogram charts, offer more details quickly. Both models include a data logging mode for easier trend analysis and a digitizing mode for capturing transients.

Measure low-power devices. The ability to measure very low current, 1 µA range with pA resolution, allows you to make measurements on very low power devices.

Maintain calibrated measurements. Auto calibration allows you to compensate for temperature drift so you can maintain measurement accuracy throughout your workday.

34460A/34461A Basic True*volt* DMMs

- Up to 1,000 readings/s at 4½ digits
- 12 measurement functions including temperature
- Up to 10 k readings internal memory
- Color, graphical display, with built-in graphics, math, and statistics
- 34461A DMM is a replacement for the previous-generation 34401A model



34465A / 34470A Performance True*volt* DMMs

- DCV measurement accuracy of 30 ppm
- Measure sleep and standby current with pico-amp resolution
- View DC and AC volts with dual display
- 1 µA range and up to 50,000 rdgs/sec

	Bench / System		Performance	
	34460A	34461A	34465A	34470A
Digits of resolution	6½	6½	6½	7½
1 year DCV accuracy	0.0075%	0.0035%	0.0030%	0.0016%
Maximum measurement speed (readings/s)	300	1,000	5,000 std / 50,000 opt	5,000 std / 50,000 opt
DC, True RMS AC voltage ranges	100 mV – 750 V	100 mV – 750 V	100 mV – 750 V	100 mV – 750 V
DC, True RMS AC current ranges	100 µA – 3 A	100 µA – 10 A	1 µA – 10 A	1 µA – 10 A
2- and 4-wire resistance ranges	100 Ω – 100 MΩ	100 Ω – 100 MΩ	100 Ω – 1 GΩ	100 Ω – 1 GΩ
Frequency range	3 Hz – 300 kHz	3 Hz – 300 kHz	3 Hz – 300 kHz	3 Hz – 300 kHz
Diode/continuity	5 V / yes	5 V / yes	5 V / yes	5 V / yes
Other measurements	Capacitance, temperature, period			
Connectivity	USB, LAN (opt), and GPIB (opt)	USB, LAN, and GPIB (opt)		

BenchVue software included except where noted.

Digital Multimeters

Lab accuracy at production-line speeds

U3606B 5½ digit multimeter/30 W DC power supply

Get twice the measurement functionality in half the space

- Allows simultaneous supply-and-measure operations
- DMM: 120,000 count resolution with DCV accuracy 0.025%
- Power supply: Four output ranges with over-voltage and over-current protection, auto ramp and scan function and square-wave output
- Securable with PC-grade physical lock
- BenchVue software not included

34450A 5½ digit dual-display DMM

Achieve throughput breakthrough in a low-cost DMM

- 11 measurement functions, including temperature and capacitance
- Built-in histogram and basic statistical functions
- Ultra-bright OLED with dual display capability
- Up to 50,000 memory points, log up to 14 hours of data

B2980A Series femto / picoammeter and electrometer / high resistance meter

Quickly and accurately evaluate your DUTs with precision/low-noise sourcing and easy-to-use GUI

- Current measurement resolution of 0.01 fA (0.01 x 10-15 A)
- Resistance measurements up to 10 PΩ (10 x 1015 Ω)
- 4.3" liquid crystal display for numeric, graph, trend chart, and histogram viewing
- Battery-powered versions available for low-level measurements in the presence of AC power line noise
- BenchVue software not included

BenchVue software included except where noted.

34420A 7½ digit nanovolt/micro-ohm meter

High sensitivity for low-level measurements, plus resistance and temperature

- 1.3 nVrms, 8 nVpp noise performance
- 100 pV/100 nΩ sensitivity
- Low-noise voltage measurements with resistance and temperature functions

3458A 8½ digit performance DMM

High precision and high-performance measurement solution

- 8½ digit resolution with 0.1 ppm transfer accuracy
- Measurements include DC & AC voltage, DC & AC current, 2- and 4-wire resistance, frequency and temperature
- Up to 100,000 readings/s
- Similar performance, specifications, and 100% code compatible with the previous version
- 148K memory for data logging
- RoHS compliant
- BenchVue software not supported

True*volt* performance of the 34465A & 34470A DMMs

When you're perfecting a design you don't want to be concerned about measurement errors created by extraneous factors. Keysight's new 6 ½ digit and 7½ digit True*volt* Series digital mulitmeters (DMMs) account for these errors so you don't have to, giving you greater confidence in your results..

True*volt* Performance Series 6½ & 7½ digit Digital Multimeters

Measure voltage & current at the same time with a True*volt* DMM

Monitoring both current and voltage at the same time usually requires 2 different DMMs. With a feature in True*volt* DMMs and an external resistor, you can get both measurements at virtually the same time.

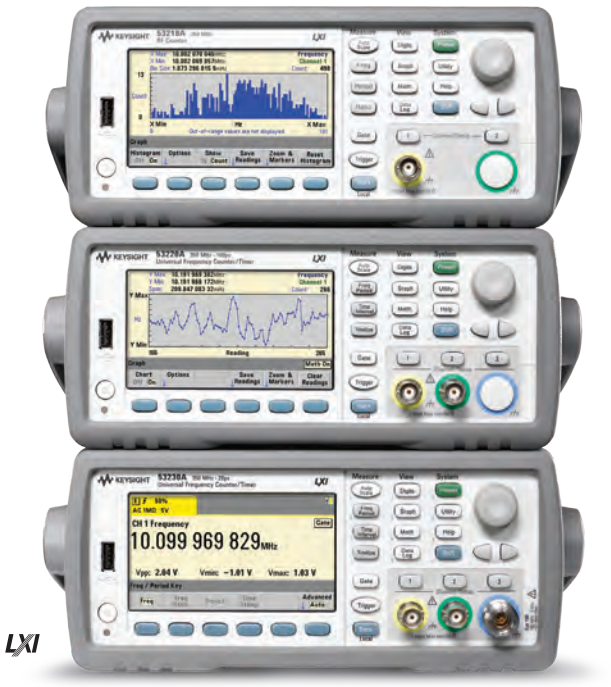
Watch the video for a quick solution to this problem.

Measuring voltage & current simultaneously

53200 Series RF and universal frequency counters/timers

Accelerate measurement and analysis with histograms, trend charts and statistics

- 350 MHz, with options up to 15 GHz
- Advanced capabilities: histograms, trending, data logging, optional pulse/burst microwave measurements
- Up to 20 ps single-shot time interval measurements
- Continuous, gap-free measurements, with time stamps on signal edges
- Onboard memory for 1 M readings
- 53181A, 53131A, 53132A counter emulation mode

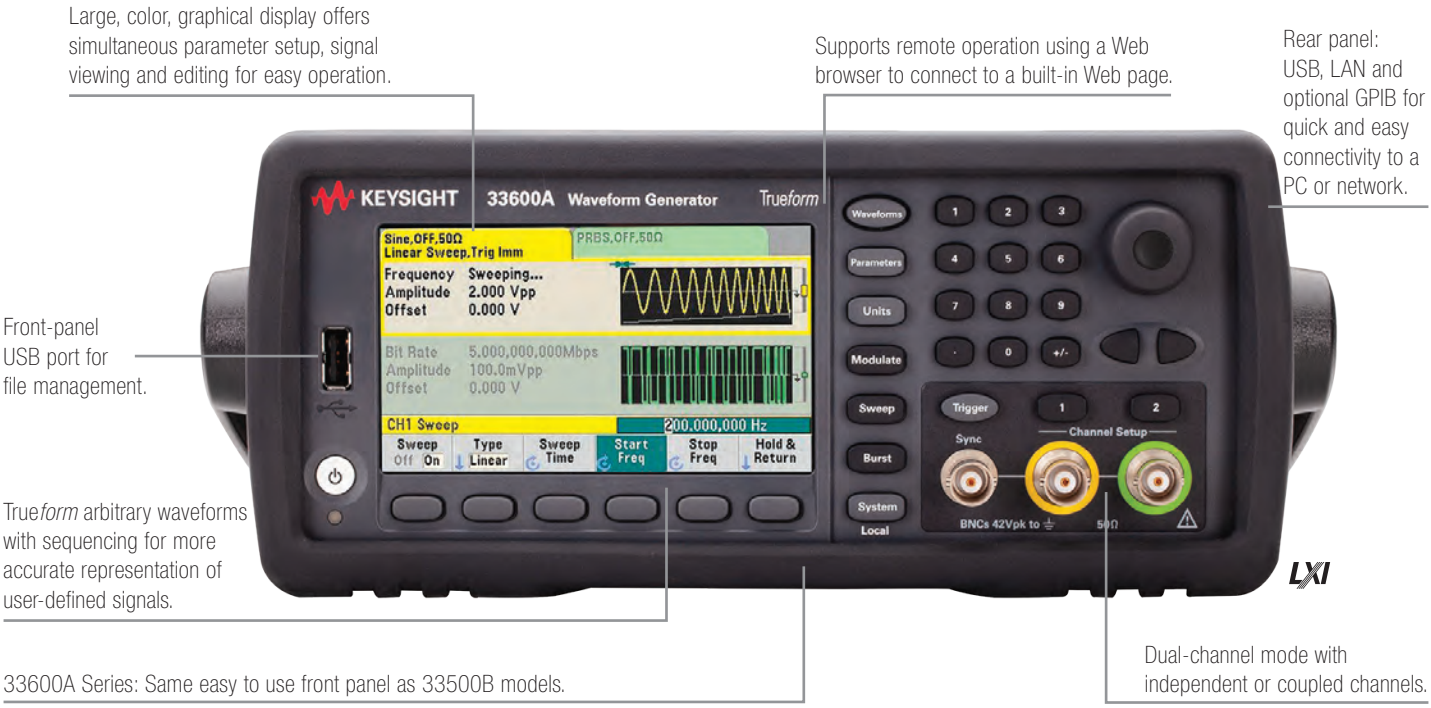


53210A
53220A
53230A

	53210A	53220A	53230A
Type	1 channel; optional RF channel	2-channel universal; optional RF channel	
Measurements	Frequency, frequency ratio, period, max./min./peak-to-peak input voltage		
		Time interval, rise/fall time, single period, pulse width, duty cycle, phase, totalize	
		NA	Timestamp/modulation domain analysis
Analysis	Math: smoothing (reading moving average), scaling, Δ-change, null		
	Statistics: mean, standard deviation, max., peak-to-peak, count; full color display for trendline, histograms		
		Allan deviation	
Frequency range (optional)	DC to 350 MHz (6 or 15 GHz)		
Frequency resolution	10 digits/s	12 digits/s	
Time interval	NA	100 ps	20 ps
Connectivity	USB, LAN, and GPIB		

True*form* Waveform Generators

Superior signal fidelity with True*form* technology provides the highest resolution, lowest distortion and lowest jitter when compared to DDS function/arbitrary waveform generators all at a comparable price.



33600A Series True*form* waveform generators

Four upgradeable models are available at 80 and 120 MHz with 1- and 2-channels. The 33600A Series offers a full set of standard features and an optional baseband IQ signal player.

- 80 and 120 MHz, 1- and 2-channel models
- 2-channnel coupling and synchronization
- True*form* arbitrary waveforms with sequencing
- PRBS serial patterns

	33611A	33612A	33621A	33622A
Number of channels	1	2	1	2
Frequency	1 µHz to 80 MHz sine		1 µHz to 120 MHz sine	
Standard waveforms	Sine, square, ramp, pulse, triangle, Gaussian noise, PRBS, DC, standard on all models IQ baseband standard for 2-channel arbitrary capable models only and is not optional for 1-channel models			
Arbitrary waveforms	True*form* arbitrary waveforms with sequencing, 4 MSa/channel memory, optional 64 MSa/channel			
Sampling rate, resolution	660 MSa/s, 14-bits		1 GSa/s, 14-bits	
Modulation types	AM, FM, PM, FSK, BPSK, PWM, Sum (carrier + modulation)			
Burst	Counted or gated			
Sweep	Linear, logarithmic and frequency list			
Total harmonic distortion and jitter	<0.03% THD and < 1 ps jitter			
Timebase	TCXO standard, OCXO optional for higher stability			
Options and security	NISPOM and file security, OCXO high-stability timebase			
Connectivity	USB, LAN, GPIB (optional)			

33500B Series True*form* waveform generators

Eight upgradeable models are available at 20 and 30 MHz with 1- and 2-channels. The 33500B Series offers a full set of standard features and an optional baseband IQ signal player.

- Sine waves with up to 5x lower harmonic distortion
- Pulses up to 30 MHz with <40 ps jitter
- Individual arbitrary waveform segments that can be sequenced
- 16 bits of resolution with 1 mVpp to 10 Vpp amplitude
- IQ baseband signal player standard for 2-channel models

	33511B	33512B	33521B	33522B	33509B	33510B	33519B	33520B
Number of channels	1	2	1	2	1	2	1	2
Frequency	20 MHz	20 MHz	30 MHz	30 MHz	20 MHz	20 MHz	30 MHz	30 MHz
Standard waveforms	Sine, square, ramp, pulse, triangle, Gaussian noise, PRBS (pseudorandom binary sequence), DC							
Arbitrary waveforms	True*form* arbitrary waveforms with sequencing, 1 MSa/channel standard, 16 MSa/channel optional				Optional arbitrary waveforms			
Sampling rate, resolution	160 MSa/s, 16 bits		250 MSa/s, 16 bits		160 MSa/s, 16 bits		250 MSa/s, 16 bits	
Modulation types	AM, FM, PM, FSK, BPSK, PWM, sum (carrier + modulation)							
Burst	Counted or gated							
Sweep	Linear, logarithmic and frequency list							
Timebase	TCXO standard, OCXO optional for higher stability							
Total harmonic distortion and jitter	<0.04% THD and <40 ps jitter (rms)							
Options and security	NISPOM and file security, OCXO high-stability timebase							
Connectivity	USB, LAN, GPIB							

33210A 10 MHz function generator

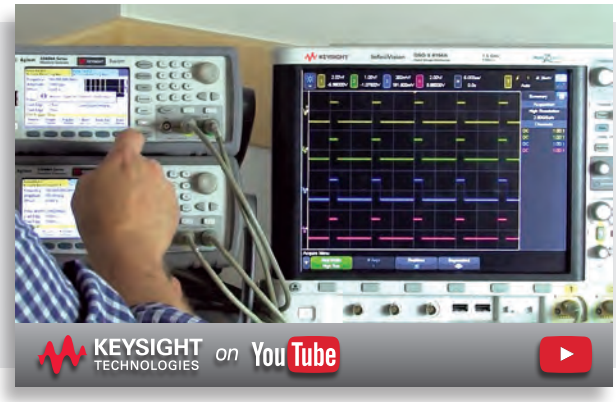
The most affordable model for basic functions and waveforms

- 10 MHz sine and square waveforms
- Ramp, triangle, noise, pulse generation with variable edge, and DC waveforms
- AM, FM, and PWM modulation, linear and logarithmic sweeps and burst all standard
- Arbitrary waveforms optional

Don't know how to phase synchronize multiple waveform generators?

Watch this video to see how easy it is.

Synchronizing Multiple Waveform Generators



BenchVue Software

Data Acquisition Control & Analysis

Easily control Keysight data acquisition units to configure channels, execute scan lists and log data. Clearly analyze or view measurement data using visualization tools and a broad choice of display options.

BenchVue software supports 34970A, 34972A, 34980A, DAQ970A, DAQ973A and modules.

34980A multifunction data acquisition switch / measure unit

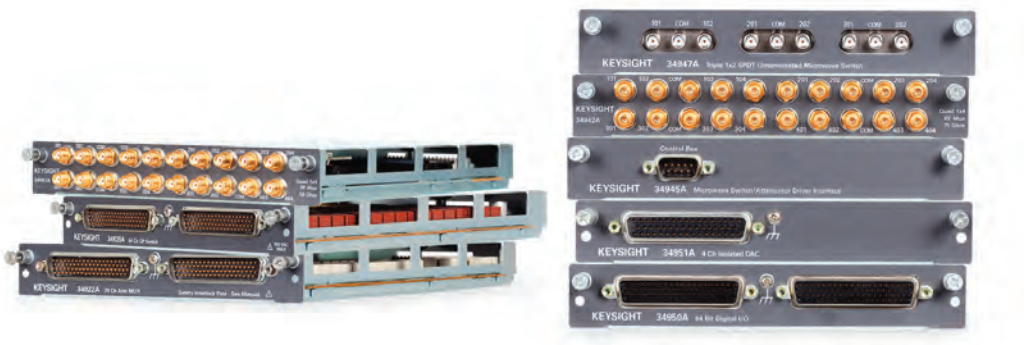
Achieve maximum versatility in a minimum footprint

This 8-slot mainframe includes a choice of 21 optional plug-in modules for custom configurations. As a one-instrument solution it is ideal for medium to high-density switch/measure applications in design verification, automated test, and data acquisition applications.

- Optional built-in 6½ digit DMM — make 11 measurements with up to 3,000 readings/s
- High-performance switching — up to 560 2-wire multiplexer channels or 4,092 matrix cross-points in one mainframe
- Built-in USB, LAN, and GPIB

21 modules to choose from

Model	Description	Key specifications
34921A-25A	Multiplexers	Up to 300 V/1 A
34931A-33A	Matrix switches	Up to 128 crosspoints
34934A	High-density matrix switch	512-crosspoint reed matrix
34937A/38A	GP switches	1 A and 5 A
34939A	High-density GP switch	64-channel Form A channels up to 60 W
34941A/42A	RF switches	50 or 75 ohms
34945A	µW switch/attenuation driver	Drive 64 coils
34946A/47A	µW switches	SPDT switch to 26.5 GHz
34950A-34959A	System control	Choose from D/A, DIO, counter and breadboard



DAQ970A/DAQ973A data acquisition systems

Get the next-generation data acquisition (DAQ) system with a 3-slot mainframe and your choice of 9 plug-in modules. Interface with the DAQ using Keysight BenchVue DAQ software, the intuitive graphical front panel with task oriented, self-guiding menus, or a web browser.

- Advanced 6½ digit internal DMM with improved accuracy and faster measurement speed
- Ability to measure very low current ranges (1 µA DC and 100 µA AC) and higher resistance range (1000 MΩ)
- New auto-calibration that compensates for internal drifts caused by time and temperature changes
- 3497XA compatible, program and configuration
- LAN and USB for easy PC connectivity (DAQ973A includes additional GPIB)

PLUS

- All modules have been updated to have improved switching speeds and accuracies
- DAQM900A solid state multiplexer and DAQM909A 4-channel digitizer modules
- NEW DAQM909A 4 channel simultaneous sampling digitizer module, up to 800 kSa/sec sample rate

Modules for DAQ970A and DAQ973A Systems

Description	Modules	Key specifications
20-channel solid-state multiplexer	DAQM900A	Up to 450 ch/s
20-channel multiplexer + 2 current channels	DAQM901A	Armature 2/4 wire, 60 ch/s (80 ch/s for DAQ970A), up to 300 V, 1 A
16-channel multiplexer	DAQM902A	Reed 2/4 wire, 250 ch/s, up to 300 V, 50 mA
20-channel actuator/GP switch	DAQM903A	SPDT/Form C, 120 ch/s, up to 300 V, 1 A
4x8 matrix	DAQM904A	Armature 2-wire, 120 ch/s, up to 300 V, 1 A
2 GHz, dual 4-channel, RF mux, 50Ω	DAQM905A	Common low (not terminated, 60 ch/s up to 42 V, 0.7 A
Multifunction module	DAQM907A	Two 8-bit digital I/O ports, up to 42 V, 400 mA 26-bit 100 kHz event counter, up to 42 V Two 16-bit analog outputs, up to ±12 V, 10 mA
40-channel single-ended multiplexer	DAQM908A	Common low (no 4-wire meas.) 60 ch/s (80 ch/s for DAQ970A), up to 300 V, 1 A
4-channel simultaneous sampling digitizer	DAQM909A	Differential inputs, up to 800kSa/s sampling rate, 24-bit resolution

USB Products

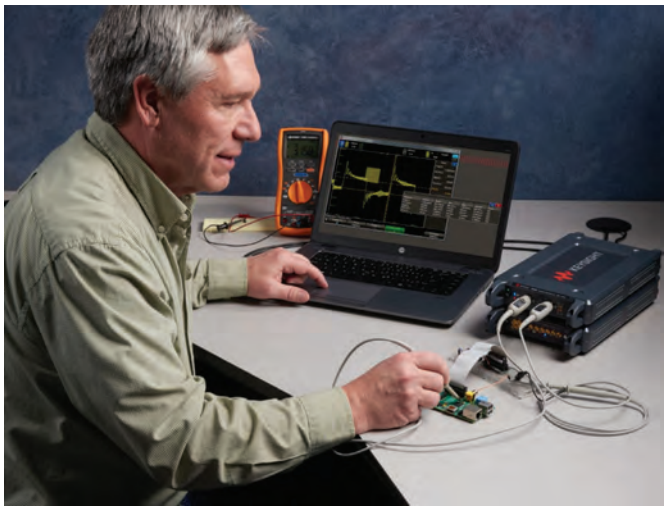
Compact form with zero compromise in performance

- New faceless USB instruments controlled via PC
- Same technology and measurements as Keysight benchtop and modular instruments
- High-performance USB 3.0 interface

www.keysight.com/find/streamline-series

	Vector Network Analyzer (VNA	Oscilloscope
Model	P9370A, P9371A, P9372A, P9374A, P9375A	P9241A, P9242A, P9243A[1]
Bandwidth	300 kHz to 26.5 GHz	200 MHz, 500 MHz and 1 GHz
Additional capabilities	– Full 2-port – Ability to extend the number of ports – Same calibration and metrology as all trusted Keysight VNAs – Automatic fixture removal – Time domain analysis – Scalar / mixer converter measurements	– 2 analog channels – 5 GSa/s – 1,000,000 wfms/s – Zone triggering – 6-in-1 instrument: arbitrary waveform generator, frequency response analyzer, digital voltmeter, counter, protocol analyzer
BenchVue supported	No	Yes

[1] See page 11 for P924xA supported X-Series oscilloscope software application bundles.



www.keysight.com/find/connectivity

USB modular instruments

U2701A/02A	100/200 MHz oscilloscope
U2722A/23A	3-channel source measure unit
U2741A	5½ digit digital multimeter
U2761A	20 MHz function generator
U2751A	4x8 switch matrix

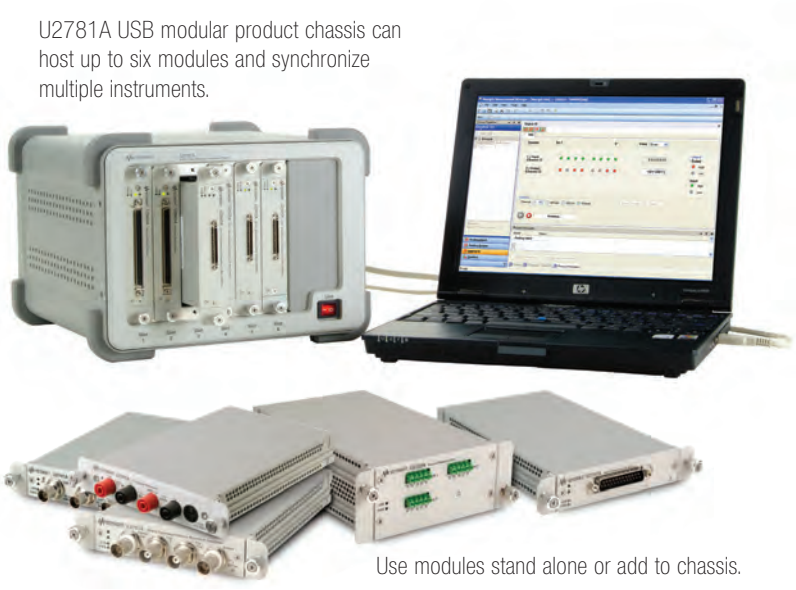
USB modular data acquisition

U2300 Series	USB modular multifunction DAQ devices
U2500 Series	USB modular simultaneous-sampling multifunction DAQ devices
U2600 Series	USB modular isolated digital I/O devices
U2802A	31-channel thermocouple input module

Converters	
82357B	USB/GPIB interface
E5810B	LAN/GPIB/USB gateway

GPIB cards, cables, and adapters	
82350C	High performance PCIe GPIB interface card
10834A	GPIB to GPIB adapter
10833A/B/C/D/F or G	GPIB cables

U2781A USB modular product chassis can host up to six modules and synchronize multiple instruments.



Use modules stand alone or add to chassis.

YOU DREAM. WE TEST.

Keysight Technologies: Accelerating innovation to connect and secure the world.

Whether you seek to overcome barriers to innovation, transform your development processes, or simply be first and best in your market, Keysight's solutions optimize networks, integrate workflows, and validate tomorrow's technologies with unprecedented performance backed by decades of research and expertise.

INNOVATE

Push products to new heights of excellence with high-performance, high-integrity design, test, and optimization solutions backed by deep expertise in next-generation communications and electronics standards.

TRANSFORM

Reinvent your innovation processes with seamless workflows, deeper insights, expert consulting, and comprehensive services that help you save time and money, so you can focus on what you do best.

WIN

Get a competitive edge by partnering with the global leader who will work side-byside with you and your team to help you innovate to win in your market and make a difference in the world.

The Keysight RF Bench and Handheld Instruments

Reach higher in RF — with confidence

Keysight Authorized Distributors now offer a range of RF instruments that deliver tremendous value, balancing excellent performance with affordable pricing. To see the full portfolio of RF products offered by Keysight Authorized Distributors, visit: www.keysight.com/find/rf

1. Handheld spectrum analyzers and network analyzers

Quality measurements in the field with rugged handheld instruments.

See pages 25-27

2. Spectrum/signal analyzers

Value-priced, general-purpose spectrum analysis.

See pages 28-29

3. Audio analyzer and signal generators

Assure quality while minimizing the cost of your general-purpose testing with reliable RF performance and capability.

See pages 30-31

4. Power sensors and meters

Meters and sensors cover numerous frequency and power ranges to accurately measure the power of RF and microwave signals.

See page 32

5. RF & Microwave test accessories

Keysight test accessories complete your test solution and eliminate the weak links in your measurement system.

See page 33

6. Network analyzers

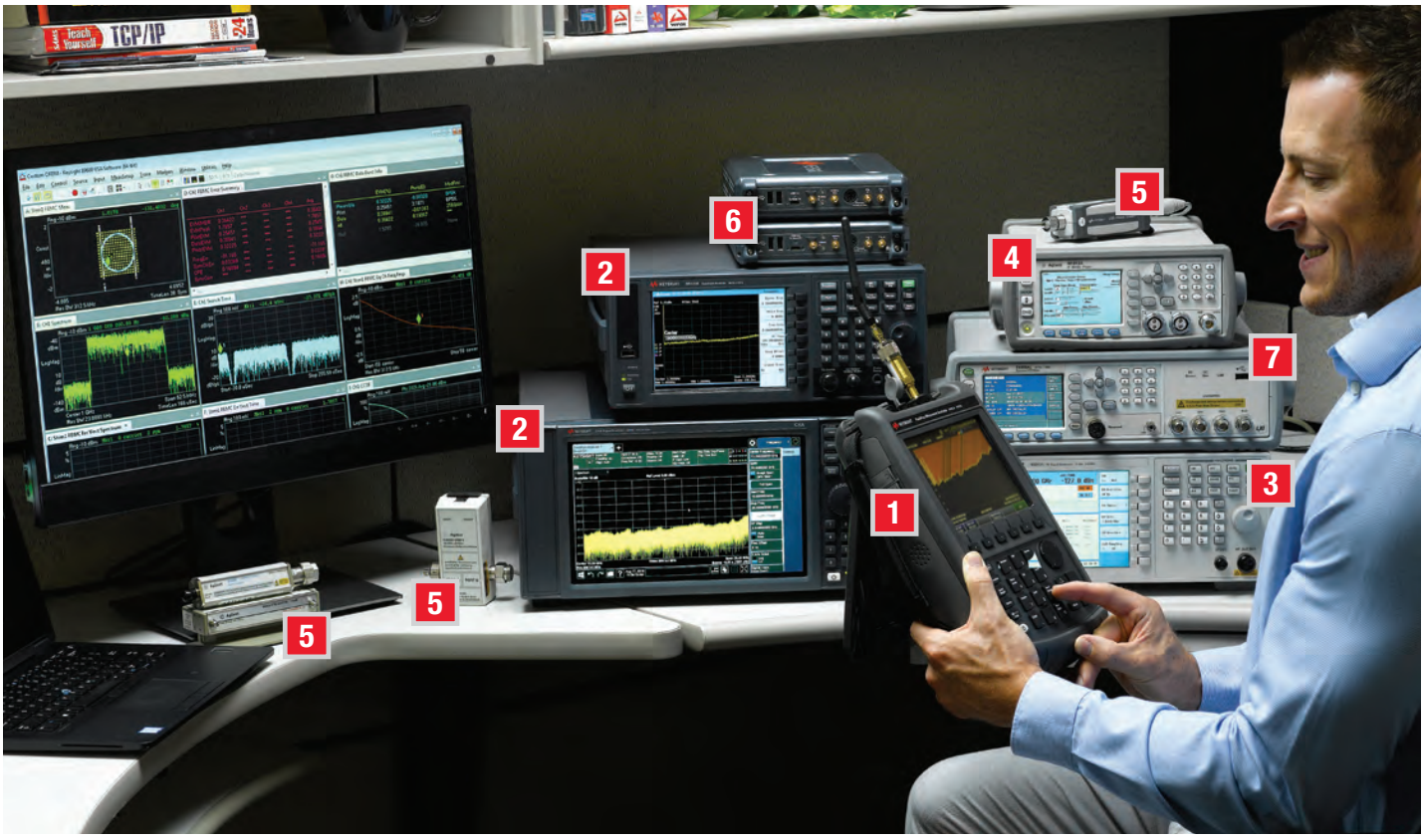
Industry standard of middle-range vector network analyzer, providing best-in-class performance, for passive device test.

See page 34

7. LCR meters

Bring unparalleled accuracy to your lab for component evaluation.

See page 44



N9340B and N9342/43/44C Handheld Spectrum Analyzers (HSAs)

Field testing just got easier

If you are making measurements in the field, the Keysight handheld spectrum analyzer family makes your job easier. They've got the features you need for operating in tough field environments, and their measurement performance gives you confidence the job's been done right. The HSAs let you automate routine tasks to save time and ensure consistent results.

- **Field ready:** Rugged design, without fans or vents, clear viewing day and night
- **Benchtop performance:** –164 dBm/Hz DANL, 20 GHz sweep time < 0.9 s
- **Task planner:** Reduces setup time by up to 95% while enabling test automation and improving consistency
- **Multi-functional:** Signal monitoring, interference hunting, EMI pre-compliance test, stimulus/response measurement, and AM/FM, ASK/FSK signal analysis
- BenchVue not supported on N9304B

	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
DANL, normalized to 1 Hz	–164 dBm	–164 dBm	–155 dBm	–155 dBm
Phase noise	-87 dBc at 30 kHz -120 dBc at 1 MHz	–89 dBc at 30 kHz –119 dBc at 1 MHz	–89 dBc at 30 kHz –119 dBc at 1 MHz	–89 dBc at 30 kHz –119 dBc at 1 MHz
TOI	10 dBm	10 dBm	12 dBm	15 dBm
Auto tune	No	Yes	Yes	Yes
Built-in GPS	No	Optional	Optional	Optional
Full span sweep time	1 s	< 0.4 s	< 0.7 s	< 0.9 s
Optional measurement features	AM/FM/ASK/FSK signal analysis, stimulus/response measurement, spectrum monitoring, AM/FM IBOC measurement	AM/FM/ASK/FSK signal analysis, stimulus/response measurement, spectrum monitoring, channel scanner, cable antenna tester[1], U2020/U2040 X-Series and U2000 Series USB power sensor support, time-gated sweep and security feature		

1. Cable antenna tester option is only available on N9342C HSA.

FieldFox Handheld Analyzers

Quality RF measurements in the field: carry precision with you

Measuring up and earning a spot in your field kit is the driving idea behind Keysight's FieldFox handheld analyzers. Compact and lightweight at 3.34 kg or 7.35 lbs, FieldFox eliminates the need to transport benchtop equipment to the field or carry multiple instruments. FieldFox offers budget flexibility allowing you to choose the capabilities you need today and easily upgrade later.

Precise and portable

- Maximum frequency from 4 to 50 GHz across family of 34 models with the addition of "B" models
- Measurement results agree with those obtained with benchtop analyzers
- Compact form factor measures 29 x 19 x 8 cm (11.5 x 7.4 x 3.2 in) approximately
- Light weight at just 3.34 kg (7.35 lbs) approximately

Rugged and weather resistant

- Dust-free design with no internal fans or vents extends reliability in harsh environments
- Weather-resistant design withstands salty, humid environments
- MIL-PRF-28800F Class 2 compliant

	Combination analyzers			Vector network analyzers		Spectrum analyzers	
NEW **Model number**		**N9913/4/5/6/7/8B**				**N9933/4/5/6/7/8B**	
Maximum frequency range		4, 6.5, 9, 14, 18, 26.5 GHz				4, 6.5, 9, 14, 18, 26.5 GHz	
Model number	**N9912A**	**N9913/4/5/6/7/8A**	**N9950/1/2A**	**N9923A**	**N9925/6/7/8A**	**N9935/6/7/8A**	**N9960/1/2A**
Maximum frequency range	4, 6 GHz	4, 6.5, 9, 14, 18, 26.5 GHz	32, 44, 50 GHz	4, 6 GHz	9, 14, 18, 26.5 GHz	9, 14, 18, 26.5 GHz	32, 44, 50 GHz
Cable and antenna analyzer	Standard			Optional		Optional (VSWR & RL)	
Vector network analyzer	Optional (1 port)	Optional		Standard		—	
QuickCal	Optional	Optional[1]	—	Optional		—	
Full 2-port S-parameters	—	Optional		Optional		—	
VNA time domain	Optional			Optional		—	
Spectrum analyzer	Optional			—		Standard	
Analysis bandwidth	—	10 MHz (standard) (Optional 40, 100 MHz[2])		—		10 MHz (std) (Optional 40, 100 MHz[2])	10 MHz (std)
Real-time spectrum analyzer	—	Optional		—		Optional	
NEW Indoor/Outdoor mapping	—	Optional		—		Optional	
89600 VSA software support	—	Optional		—		Optional	
NEW Over-the-Air 5G NR	—	Optional (B-Series only)	—	—		Optional (B-Series only)	
NEW Over-the-Air LTE FDD	—	Optional		—		Optional	
NEW EMF measurements	—	Optional		—		Optional	
Noise figure analyzer	—	Optional		—		Optional	
Interference analyzer	Optional			—		Optional	
Tracking generator	Optional			—		Optional	
Vector voltmeter	Optional			Optional		—	
Built-in power meter	Optional			—	Optional	Optional	
USB power sensor support	Optional			Optional		Optional	
DC voltage source	—	Optional		—	Optional	Optional	
iOS device remote control	Optional			Optional		Optional	

[1] QuickCal is not available on models N99x1B or N995xA.

[2] Available on B models only, 40 and 100 MHz bandwidth options are supported with RTSA, I/Q analyzer, OTA and 89600 VSA software support.

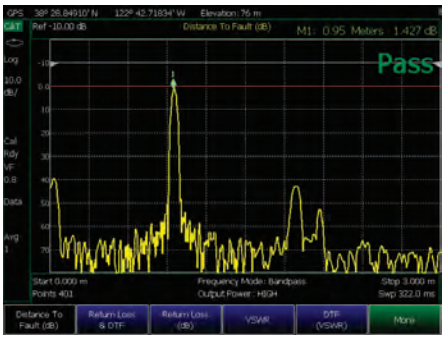
Increased Precision is Here with Wider Bandwidth

Given the new dynamics of wideband, microwave and millimeter wave communications, Keysight has developed the next generation FieldFox Microwave Analyzer with 100 MHz of real-time bandwidth and enhanced RF performance to address the ever increasing demands of 5G, satellite communications, signal monitoring, and electronic warfare applications.

The FieldFox base combination model functions as a cable and antenna tester and can be configured to supporting over 20 key RF and microwave instrument functions including signal analyzer, full 2-port vector network analyzer, real-time spectrum analyzer, over-the-air demodulation, CW signal source, power meter, and many more, in an all-in-one field proof package.

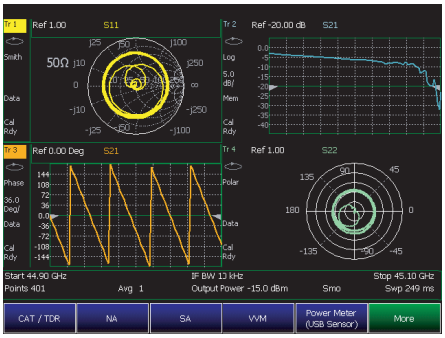
Combination (cable and antenna analyzer)

- Distance-to-fault (DTF) and return loss/VSWR
- 1-port cable loss, 2-port insertion loss, and time-domain reflectometry (TDR)
- Integrated QuickCal for simple field measurements — no calibration kit required
- System dynamic range >115dB



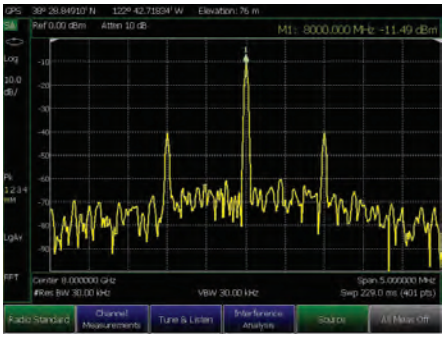
Vector network analyzer

- All four S-parameters, magnitude and phase
- Time-domain analysis, mixed-mode reflection S-parameters
- CalReady, QuickCal, full 2-port cal, TRL, waveguide cal, ECal support, and a Guided Calibration Wizard



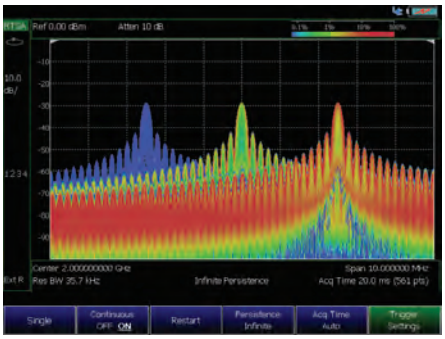
Spectrum analyzer

- Unprecedented amplitude accuracy of ± 0.3 dB with InstAlign — no warm-up required
- Tracking generator, independent source, and preamplifier covering the full frequency range
- Channel power (CHP), occupied bandwidth (OBW), interference analysis, analog demodulation



Real-time spectrum analyzer (RTSA)

- Capture signals as short as 5.52 µs with 100% POI with a maximum 100 MHz real-time bandwidth and full amplitude accuracy
- Visualize small signals as short as 47 ns independent of amplitude accuracy
- Detect a low level signal in the presence of a high-power transmitter using the spectrum density view



Basic Spectrum Analyzers (BSA) Series

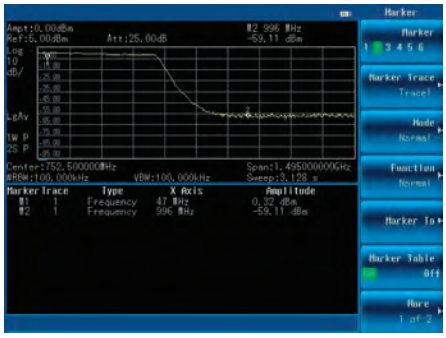
Proven reliability on your bench

BSA spectrum analyzers cover a wide frequency range and provide general purpose spectrum analysis, as well as power suite, window limit, stimulus/response measurement and ASK/FSK demodulation.

N9320B

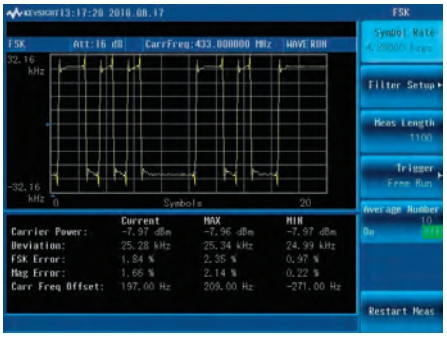
N9322C

Key specifications	N9320B	N9322C
Frequency range	9 kHz – 3 GHz	9 kHz – 7 GHz
Reference aging rate	± 1 ppm	± 1 ppm, ± 0.1 ppm (w/Opt.PFR)
Amplitude accuracy	± 0.5 dB	± 0.6 dB
Displayed average noise level, 1 GHz	-145 dBm	-152 dBm
Resolution bandwidth	10 Hz – 1 MHz	10 Hz – 3 MHz
Maximum third order dynamic range, 1 GHz	76 dB	83 dB
Standard attenuator	70 dB, in 1 dB steps	50 dB, in 1 dB steps
Phase noise at 1 GHz, 1 MHz offset	-112 dBc/Hz	-115 dBc/Hz



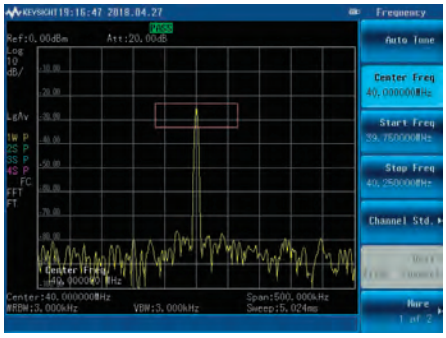
Tracking generator Option (N9320B-TG3, N9322C- TG7)

This option provides a signal source with an RF output that follows the tuning of the spectrum analyzer and increases test coverage for component-level characterization, such as insertion loss, amplifier gain and frequency response.



ASK/FSK demodulation analysis (DMA) Option

Make one-button ASK/FSK signals measurements in low power, low data rate RF, and IoT device applications for fast signal characterizations, including transmission power, FSK deviation, FSK error and carrier frequency offset.



Window Limit Feature

Quickly determine the pass/fail of measurement results for frequency and power test criteria using the automatic signal peak marker. This feature will simultaneously analyze the upper and lower limits of signal frequency and power and generate an audio alert for signals outside the passing margins.

RF and microwave accessories kit

An assortment of antenna, filters, attenuators, cables, adapters and close-field probes provide a complete solution when using Keysight low-cost handheld and benchtop solutions.

www.keysight.com/find/n9311x

N9311X-100
Near Field Probes

N9000B CXA X-Series signal analyzer

(9 kHz to 3.0, 7.5, 13.6 or 26.5 GHz)

Master the essentials with the CXA

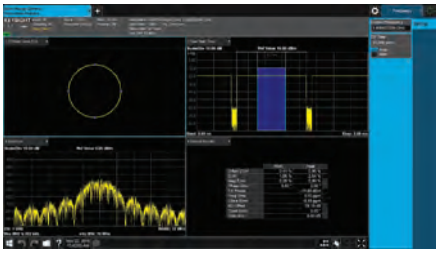
Whether you're rapidly updating a next-generation product or revising an existing design, the CXA signal analyzer helps you perform signal characterization, circuit design verification, and troubleshooting. The CXA's built-in capabilities let you perform essential measurements of frequency, power, spurious and distortion without overspending your budget.

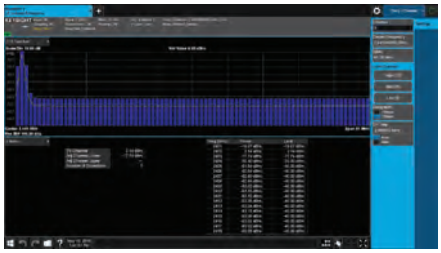
- Characterize signals and devices with general-purpose spectrum analysis and one-button PowerSuite measurements
- -163 dBm DANL @ 1 GHz (preamp on)
- Phase Noise (10 kHz offset) -110 dBc/Hz at 1 GHz
- 25 MHz analysis bandwidth
- Up to 6 GHz built-in tracking generator for stimulus/response measurements
- USB 2.0, LAN, GPIB and LXI Class C compliance
- Use X-Series measurement applications for signal demodulation analysis

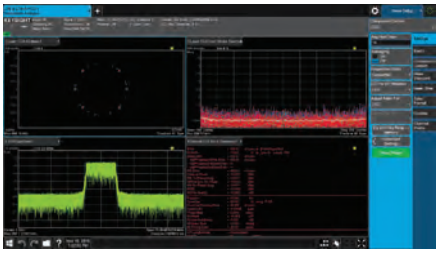
www.keysight.com/find/cxa

X-Series measurement applications for CXA

These apps provide fast, one-button RF conformance measurements to help you design, evaluate, and manufacture devices and equipment.







Featured apps	Description
General purpose	Analog demodulation, phase noise, noise figure, pulse analysis, vector modulation analyzer (VMA), EMI emission measurements
Cellular communications	W-CDMA / HSPA+, LTE / LTE-Advanced FDD, NB-IoT and eMTC, LTE / LTE-Advanced TDD, GSM/EDGE / EVO
Wireless connectivity	WLAN 802.11, *Bluetooth*®, *Bluetooth 5*, ZigBee / Z-Wave

Complete offering available at www.keysight.com/find/x-series_apps

Need an ESA spectrum analyzer replacement?

See the ESA to CXA signal analyzer migration plan on Keysight's website: www.keysight.com/find/ESA2CXA

X-Series Signal Generators

To know your device's behavior, you'll take many paths. That's the idea behind the X-Series signal generators. They produce the signals you need to test your design within and beyond its limits.

NEW CXG X-Series RF vector signal Generator

Cost-effective RF vector signal generation

With a flexible, dependable vector signal generator, you're ready for your next measurement challenge. The Keysight N5166B CXG RF vector signal generator supports essential receiver and general-purpose tests. Produce the signals you need from simple to complex, or clean to dirty. You may also playback Signal Studio waveforms for functional verification of your devices.

Accelerate product testing on multiple levels: design/engineering verification, design enhancement, throughput, cost reduction, and beyond. The CXG signal generator offers you with dependable performance at the right price.

– BenchVue currently not supported

MXG X-Series RF analog signal generator

Reach better performance

The pure and precise MXG X-Series signal generators are fine-tuned to be your "golden transmitter" in R&D. Whether you're pushing for a linear RF chain or an optimized link budget, MXG models deliver what you need: phase noise, output power, and more.

– Test radar receiver sensitivity or characterize ADCs
– Characterize nonlinear PA behavior

EXG X-Series RF analog signal generator

Achieve faster throughput

The cost-effective EXG X-Series signal generators are optimized for manufacturing test. Analog models provide the signals you need for basic parametric testing of components, functional verification of receivers, and virtually anything in between.

– Verify receiver performance by simulating complex analog modulation scenarios
– Maximize throughput with < 800 µsof frequency and power switching

To reduce cost of ownership, the X-Series signal generators are designed for high reliability and fast, easy calibration, service, and repair.

	MXG: N5181B RF analog	EXG: N5171B RF analog	CXG: N5166B RF vector
Frequency range	9 kHz to 3 or 6 GHz	9 kHz to 1, 3 or 6 GHz	9 kHz to 3 or 6 GHz
Phase noise (20 kHz offset)	–146 dBc/Hz at 1 GHz	–122 dBc/Hz at 1 GHz	–120 dBc/Hz typical
Spurious (non-harmonic)	–96 dBc at 1 GHz	–72 dBc at 1 GHz	–72 dBc at 1 GHz
Output power (1 GHz)	+26 dBm	+26 dBm	+18 dBm
Switching speed	≤ 800 µs	≤ 800 µs	5 ms
Internal IQ modulation			60 or 120 MHz
Features	LF function generator, Step/list sweep USB power meter, BenchVue software supported		Narrow pulse modulation Custom digital modulation
	AM, FM, PM, Pulse, Pulse train		

N9310A signal generator

Professional performance and compact size for general-purpose testing needs

- Ideal for benchtop R&D, education, field measurements, and manufacturing
- 9 kHz to 3 GHz frequency coverage with 0.1 Hz resolution
- Rugged body, large display and full-size front panel
- USB connectivity for test automation and memory stick support
- Extensive analog modulation: AM, FM, phase, & pulse modulation
- Optional I/Q modulator
- Optional precision frequency reference

U8903B audio analyzer

Measure and quantify analog and digital audio signals with a single box

- Offers combined functionality of a distortion meter, SINAD meter, frequency counter, AC voltmeter, DC voltmeter and FFT analyzer with a low-distortion audio source
- Configure 2 to 8 analog analyzer channels
- Two-in-one digital card covers AES3, SPDIF and DSI formats
- Measure speech quality with PESQ and POLQA options
- Measure audio quality directly from *Bluetooth* signal

USB and LAN Power Sensors

USB power sensors plug directly into your PC or enabled Keysight instrument and give you the capability to measure power in a compact and portable form factor. All models feature internal zeroing to eliminate external calibration. Setup is fast and easy; just connect and start measuring immediately with BenchVue software.

U2040/53/63 and L2050/60 X-Series USB/LAN peak and average wide dynamic range power sensors

- 10 MHz to 6/18/33/40/50/53 GHz; wide power range, from –70 to +0/26 dBm
- Extremely fast measurement speed of 50,000 readings per second
- LAN/power over Ethernet (PoE) based sensor with thermal vacuum option (U2049XA-TVA, or L2065XT LAN power sensor)

U2020 X-Series USB peak and average power sensors

- 50 MHz to 18/40/50 GHz; –45 to +20 dBm power range
- Fast pulse analysis with 30 MHz video bandwidth
- Greater than 25,000 readings per second

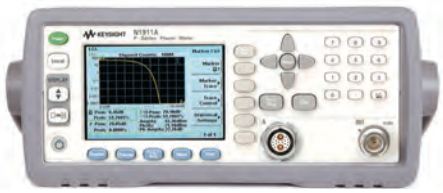
U8480 Series USB thermocouple power sensors

- Wide frequency range DC/10 MHz to 18/33/50/67/120 GHz; –35 to +20 dBm power range
- Fastest available thermal power sensor
- Reference level accuracy with linearity less than 0.8 percent

U2000 Series USB average power sensors

- 9 kHz to 6/18/24/26 GHz
- –60 to +20 dBm or -30 to +44 dBm power range

Power Meters



P-Series N1911A/12A (single-channel/dual-channel)

- Key measurements: peak, average, peak-to-average ratio, rise time, fall time, and pulse width
- 30 MHz video bandwidth; 13 ns rise/fall time
- Single-shot real-time capture at 100 Msamples per second
- 22 predefined signal formats, including LTE
- USB, LAN and GPIB standard; LXI Core compliant

EPM Series N1913A/14A (single-channel/dual-channel)

- Color LCD screen simplifies viewing and analysis
- Measurement speed up to 400 readings/second
- USB, LAN and GPIB standard; LXI Core compliant
- Multi-channel power measurement with USB average power sensor

Use these compatible sensors with your Keysight power meters

	Model number	N8480 Series sensors	P-Series sensors	E-Series E9320 sensors	E-Series E9300 sensors	E-Series CW sensors	8480D Series sensors	E/V/W8486A waveguide sensors
P-Series	N1912A	–35 to +20 dBm –5 to +44 dBm	–35 to +20 dBm	–65 to +20 dBm	–60 to +20 dBm –30 to +44 dBm	–70 to +20 dBm	–70 to –20 dBm	–70 to –20 dBm –35 to +20 dBm
	N1911A							
EPM Series	N1914A		N/A	N/A				
	N1913A							
	E4417A			–65 to +20 dBm				
	E4416A							

Eliminate the Weak Links in Your Measurement System

RF and microwave manual and programmable step attenuators

- Fast, precise signal-level control up to 50 GHz
- High reliability and exceptional repeatability reduces downtime
- Attenuation range of 121 dB in 1 dB steps

Fixed attenuators

- Precise attenuation, flat frequency response, and low SWR over broad frequency range up to 67 GHz

Model	Frequency range (DC to)	Type	Attenuation
8494G	4 GHz	Programmable	0 to 11 dB, 1 dB steps
8491A	12.4 GHz	Fixed	3, 6, 10, 20, 30, 40, 50, 60 dB
8495B	18 GHz	Manual	0 to 70 dB, 10 dB steps
8495D	26.5 GHz	Manual	0 to 110 dB, 10 dB steps

Model	Frequency range (DC to)	Type	Attenuation
84904L	40 GHz	Programmable	0 to 11 dB, 1 dB steps
8490G	67 GHz	Fixed	3, 6, 10, 20, 30, 40 dB
J7204/5 A/B	6/18 GHz	One box 4/5 channels	0 to 121 dB, 1 dB steps

Low-noise and system amplifiers for signal conditioning

- Broadband performance up to 50 GHz optimizes the operating range of your test systems
- Excellent noise figure and high gain significantly reduces overall test system noise figure

Type	Model	Frequency	Gain	Noise figure
Pre-amplifier	87405B	0.01 to 4 GHz	22 dB	5 dB
	87405C	0.1 to 18 GHz	25 dB	6 dB
	N4985A-S30	0.00001 to 30 GHz	30 dB	5 dB
	N4985A-S50	0.00001 to 50 GHz	27 dB	6 dB
System amplifier	83020A	2 to 26.5 GHz	30 dB	13 dB
	83050A	2 to 50 GHz	21 dB	10 dB

NEW J7201A/B/C attenuation control units, DC to 6/18/26.5 GHz, 0 to 101/121 dB, 1 dB steps

- Attenuation sweep function defines the sweep time (- 50 ms to 10 s; 50 ms incremental), number of cycles and step size
- Relative attenuation step function
- Attenuation steps - 0 dB to 121 dB, 121 dB to 0 dB for the preset number of cycles (1 to 1000)
- 0.03 dB insertion loss

High-Performance Electro-Mechanical Switches 87104/6D, 87222D/E

- Exceptional 0.03 dB insertion loss repeatability cycles ensure accuracy and reduces calibration cycles over a long operating life of 5 million cycles
- Excellent isolation of more than 65 dB to 40 GHz reduces channel-to-channel crosstalk
- Broad selection of configuration of SPDT, SP4T, SP6T and transfer switches with operating frequency up to 50 GHz

E5061B ENA Series vector network analyzer

- Choose 50- or 75-ohm inputs
- Hardware options 3L3, 3L4/3L5 for applications, including power integrity
- Down to 5 Hz frequency
- Combine network and impedance analysis (+Option 005)
- BenchVue software supported

E5063A ENA vector network analyzer

- Many frequency options, upgradable at any time
- Option 011 for PCB manufacturing test
- Six languages supported via softkey
- Help in English/Simplified Chinese
- All Keysight calibration kits supported, including ECal modules
- BenchVue software supported

P937xA USB vector network analyzers (VNA)

- Compact, faceless, USB instruments
- Wide frequency from 300 kHz to 26.5 GHz
- Measurements, automated code capabilities, calibration, metrology and intuitive GUI are the same as benchtop VNAs
- 2-port with ability to extend the number of ports

See the USB modular products on page 22 for more details.

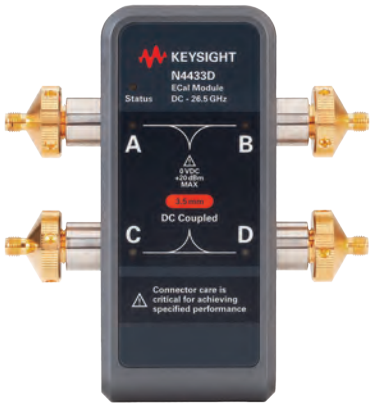
	E5061B	E5063A	P937xA
Form factor	Benchtop	Benchtop	USB
Test port	2-port 50Ω or 75Ω	2-port 50Ω	2-port 50Ω
Connector type	Type-N	Type-N	3.5 mm
Minimum frequency	5 Hz (Option 3L3/3L4/3L5) 100 kHz (Option 1xx/2xx)	100 kHz (Settable to 50 kHz)	300 kHz
Maximum frequency	0.5, 1.5, 3 GHz	0.5, 1.5, 3, 4.5, 6,5, 8.5, 14, 18 GHz	4.5, 6.5, 9, 14, 20, 26.5 GHz
Dynamic range	120 dB (spec.)	117 dB (spec.), 122 dB (typ.)	115 dB (spec.), 122 dB (typ.)

N7550 Series electronic calibration modules (ECal)

- Frequency coverage from DC to 4, 6.5, 9, 14, 18, 26.5 GHz
- Supports Type N and 3.5 mm connectors
- Smaller, lighter 2-port ECal module
- Zero wait time for faster calibration
- Convenience of ECal with the performance of an economy mechanical kit

NEW N443xD Series electronic calibration modules (ECal)

- 4-ports, frequency coverage from DC to 13.5, 18, 26.5 GHz
- Connector choices of N-type, 3.5 mm, 7-16, 4.3-10
- Efficient single calibration standard
- Precision, accurate transfer standards
- Supported by Keysight vector network analyzers



Power Supply Collection

Low-noise, accuracy and speed

Our broad selection of both bench-friendly and system-ready instruments meet your test challenges from basic to your most complex.

DC bench power supplies

E36100 Series	E36300 Series	E36200 Series	E3600 Series
			
– 5 models – 1 output – 30 to 40 W – Testing low power devices	– 3 models – 3 outputs – 80 or 160 W – Power and characterizing devices	– 4 models – 1 or 2 outputs – 200 or 400 W – Testing high power devices	– 14 models – 1 or 2 outputs – 30 to 200 W – A model for every application

DC system power supplies

N6700 Modular Series	N5700 Series	N8700 Series	N8900 Series
			
– 30+ modules – 1 to 4 outputs per mainframe – 50 to 500 W per output – Modular flexible to expand and change with your testing needs over time	– 24 models – 1 output – 750 or 1500 W – Meets your test needs up to 1500 W in a compact 1 U size	– 21 models – 1 output – 3300 or 5000 W – Meets your high-power test needs in a compact size	– 28 models – 1 output – 5000, 10000, or 15000 W – Flexibility to expand up to 100 kW to meet your highest power test needs

DC power analyzer and sources

N6705 DC power analyzer	B2961/62A low-noise source	B2900 source measure units
		
– 30+ modules – 1 to 4 outputs – 50 to 500 W per output – Characterize your devices in real-time without a PC	– 2 models – 1 or 2 output – 6.5 digit resolution – Component testing, low noise voltage/current source 10 µVrms	– 4 models – 1 or 2 output – 5.5 or 6.5 digit resolution – Component I-V measurements without PC programming

Power Supplies

Keysight offers more than 300 power products to meet your specific needs

The Keysight Power Products Selection Guide helps you choose your instrument by the number of outputs, output power characteristics, packaging, special features and application specific solutions.

www.keysight.com/find/PowerBrochureDisty

E36100B Series DC power supplies

Designs change — and so should your DC power supply. Meet the E36100, engineered to power your designs safely during manual tests or automated sequences.

- Choose the best model for your needs: five models offer up to 5 A or 100 V
- Save space on your bench, 2U ¼-form factor
- Connect for computer control with standard LAN (LXI Core) and USB connectivity
- Easily view the high-contrast OLED display from anywhere on your bench, even from a sharp angle

Model	Voltage	Current	Power
E36102B	6 V	5 A	30 W
E36103B	20 V	2 A	40 W
E36104B	35 V	1 A	35 W
E36105B	60 V	0.6 A	36 W
E36106B	100 V	0.4 A	40 W

E3600 Series DC power supplies

Reliable power, repeatable results

For environments that need to watch test costs as closely as they watch test results.

- Extremely low output noise—as low as 1 mV_{pp}/0.2 mVrms
- Tight 0.01% load and line regulation for steady output power levels
- Fast load transient response time (<50 µs)
- 16 models from 30 to 200 W output power, 2-3U high
- Convenient front-panel, GPIB, and RS-232 programming (except on E3620A and E3630A)

E3640A

Model	Output	Range	Voltage	Current	Power
E3632A	1	2	15 V 30 V	7 A 4 A	120 W
E3633A	1	2	8 V 20 V	20 A 10 A	200 W
E3634A	1	2	25 V 50 V	7 A 4 A	200 W
E3620A	2	1	25 V	1 A	50 W
E3630A	3	1	6 V 20 V -20 V	2.5 A 0.5 A 0.5 A	35 W
E3640A	1	2	8 V 20 V	3 A 1.5 A	30 W
E3641A	1	2	35 V 60 V	0.8 A 0.5 A	30 W
E3642A	1	2	8 V 20 V	5 A 2.5 A	50 W
E3643A	1	2	35 V 60 V	1.4 A 0.8 A	50 W
E3644A	1	2	8 V 20 V	8 A 4 A	80 W
E3645A	1	2	35 V 60 V	2.2 A 1.3 A	80 W
E3646A	2	2	8 V 20 V	3 A 1.5 A	60 W
E3647A	2	2	35 V 60 V	0.8 A 0.5 A	60 W
E3648A	2	2	8 V 20 V	5 A 2.5 A	100 W
E3649A	2	2	35 V 60 V	1.4 A 0.8 A	100 W

E36300A Series DC power supplies

With low output ripple/noise and accurate voltage/current measurement, you can test with confidence — and power your next insight.

- 4.3" color display that shows voltage and current on all three ouputs simultaneously
- Programming/readback accuracy as low as 0.03%
- Output ripple and noise: < 2 mVpp/350 µVrms
- Data logging plus output sequencing and coupling
- Front and rear output terminals
- Color-coded ouputs and individual knobs for voltage and current
- Modern I/O (USB, LAN and GPIB)
- Triple output power supply with independent or tracking outputs

Model	Power	Outputs	DC output Rating (0 to 40 °C)	
E36311A Economy model	80 W	1	0 to 6 V	0 to 5 A
		2	0 to +25 V	0 to 1 A
		3	0 to –25 V	
E36312A Most popular model	80 W	1	0 to 6 V	0 to 5 A
		2	0 to 25 V	0 to 1 A
		3		
E36313A High current model	160 W	1	0 to 6 V	0 to 10 A
		2	0 to 25 V	0 to 2 A
		3		

E36200 Series DC power supplies

Autoranging architecture provides more current at all voltage setting. More usable power means that these 200 and 400 W supplies can test your power hungry devices.

- Single or dual outputs. Dual outputs can be internally combined into a single output with 400 W
- Auto-parallel the E36233A to create a single 40 A (30 V) ouput
- Auto-series the E36234A outputs to create a single 120 V (10A) ouput
- 4.3" color display that shows voltage and current on all ouputs simultaneously
- Programming/readback accuracy as low as 0.03%
- Output ripple and noise: < 350 µVrms
- Data logging plus output sequencing and coupling
- Front and rear output terminals
- Color-coded ouputs and individual knobs for voltage and current
- Modern I/O (USB, LAN and GPIB)

Model	Power	Outputs	DC output Rating (0 to 40 °C)	
E36231A	200 W	1	0 to 30 V	0 to 20 A
E36232A	200 W	1	0 to 60 V	0 to 10 A
E36233A	400 W	1	0 to 30 V	0 to 20 A
		2		
E36234A	400 W	1	0 to 60 V	0 to 10 A
		2		

N6700 low-profile modular power systems

Accelerate ATE with small, flexible, fast DC power

- Small size: up to 4 outputs in 1U of rack space
- Streamline tasks with built-in measurements, output sequencing, flexible triggering and digital I/O; LIST mode for user-defined arbitrary waveforms (module dependent)
- Fast output response and command processing (<1 ms)
- Perform remote programming with USB, LAN, and GPIB

Mainframes

Model	Description
N6700C	Low-profile MPS (400 W)
N6701C	Low-profile MPS (600 W)
N6702C	Low-profile MPS (1200 W)
N6705C	DC power analyzer (600 W)

Modules

Model	Type	Maximum power	Voltage	Current	Number of slots used	Number of ranges	Ripple & noise (Vp-p)	Programming accuracy	Up or down programming time with load (typical)
N6731B	Basic	50 W	0-5 V	0-10 A	1	1	10 mV	0.1% + 19 mV	20 ms
N6732B		50 W	0-8 V	0-6.25 A			12 mV	0.1% + 19 mV	
N6733B		50 W	0-20 V	0-2.5 A			14 mV	0.1% + 20 mV	
N6734B		50 W	0-35 V	0-1.5 A			15 mV	0.1% + 35 mV	
N6735B		50 W	0-60 V	0-0.8 A			25 mV	0.1% + 60 mV	
N6736B		50 W	0-100 V	0-0.5 A			30 mV	0.1% + 100 mV	
N6741B		100 W	0-5 V	0-20 A			11 mV	0.1% + 19 mV	
N6742B		100 W	0-8 V	0-12.5 A			12 mV	0.1% + 19 mV	
N6743B		100 W	0-20 V	0-5 A			14 mV	0.1% + 20 mV	
N6744B		100 W	0-35 V	0-3 A			15 mV	0.1% + 35 mV	
N6745B		100 W	0-60 V	0-1.6 A			25 mV	0.1% + 60 mV	
N6746B		100 W	0-100 V	0-1 A			30 mV	0.1% + 100 mV	
N6773A		300 W	0-20 V	0-15 A			20 mV	0.1% + 20 mV	
N6774A		300 W	0-35 V	0-8.5 A			22 mV	0.1% + 35 mV	
N6775A		300 W	0-60 V	0-5 A			35 mV	0.1% + 60 mV	
N6776A		300 W	0-100 V	0-3 A			45 mV	0.1% + 100 mV	
N6777A		300 W	0-150 V	0-2 A			68 mV	0.1% + 150 mV	
N6751A	Performance	50 W	0-50 V	0-5 A	1	Autoranging	4.5 mV	0.06% + 19 mV	0.2 ms
N6752A		100 W	0-50 V	0-10 A	1		4.5 mV	0.06% + 19 mV	0.2 ms
N6753A		300 W	0-20 V	0-50 A	2		5 mV	0.06% + 10 mV	0.4 ms
N6754A		300 W	0-60 V	0-20 A	2		6 mV	0.06% + 25 mV	0.35 ms
N6755A		500 W	0-20 V	0-50 A	2		5 mV	0.06% + 10 mV	0.5 ms
N6756A		500 W	0-60 V	0-17 A	2		6 mV	0.06% + 25 mV	0.7 ms
N6761A	Precision	50 W	0-50 V	0-1.5 A	1	Autoranging	4.5 mV	0.016% + 6 mV	0.6 ms
N6762A		100 W	0-50 V	0-3 A	1		4.5 mV	0.016% + 6 mV	0.6 ms
N6763A		300 W	0-20 V	0-50 A	2		5 mV	0.03% + 5 mV	0.4 ms
N6764A		300 W	0-60 V	0-20 A	2		6 mV	0.03% + 12 mV	0.35 ms
N6765A		500 W	0-20 V	0-50 A	2		5 mV	0.03% + 5 mV	0.5 ms
N6766A		500 W	0-60 V	0-17 A	2		6 mv	0.03% + 12 mV	0.7 ms
N6781A	Source Measure Unit (SMU)	20 W	0-20 V	0±3 A	1	Multiple	12 mV	0.025% + 200 µV	15-300 µs
N6782A		20 W	0-20 V	0±3 A	1		12 mV	0.025% + 200 µV	
N6784A		20 W	0±20 V	0±3 A	1		12 mV	0.025% + 200 µV	
N6785A		80 W	0-20 V	0±8 A	2		15 mV	0.025% + 1.8 mV	12-300 µs
N6786A		80 W	0-20 V	0±8 A	2		15 mV	0.025% + 1.8 mV	
N6791A	DC Electronic Load	100 W	0-60 V	0-20 A	1	Multiple	N/A	0.03% + 7.2 mV	N/A
N6792A		200 W	0-60 V	0-40 A	2		N/A	0.03% + 7.2 mV	N/A

N5700 and N8700 Series DC system power supplies

Basic high-power, single output power supplies

- 45 affordable models in compact 1U (750 and 1500 W) and 2U (3.3 and 5 kW) packages
- Built-in measurements and advanced programming features simplify system design
- Perform remote programming with USB, LAN, and GPIB

N5769A

N8762A

750 W models		1500 W models		3.3 kW models		5 kW models	
N5741A	0-6 V, 0-100 A, 600 W	N5761A	0-6 V, 0-180 A, 1080 W	N8731A	0-8 V, 0-400 A, 3200 W	N8754A	0-20 V, 0-250 A, 5000 W
N5742A	0-8 V, 0-90 A, 720 W	N5762A	0-8 V, 0-165 A, 1320 W	N8732A	0-10 V, 0-330 A, 3300 W	N8755A	0-30 V, 0-170 A, 5100 W
N5743A	0-12.5 V, 0-60 A, 750 W	N5763A	0-12.5 V, 0-120 A, 1500 W	N8733A	0-15 V, 0-220 A, 3300 W	N8756A	0-40 V, 0-125 A, 5000 W
N5744A	0-20 V, 0-38 A, 760 W	N5764A	0-20 V, 0-76 A, 1520 W	N8734A	0-20 V, 0-165 A, 3300 W	N8757A	0-60 V, 0-85 A, 5100 W
N5745A	0-30 V, 0-25 A, 760 W	N5765A	0-30 V, 0-50 A, 1500 W	N8735A	0-30 V, 0-110 A, 3300 W	N8758A	0-80 V, 0-65 A, 5200 W
N5746A	0-40 V, 0-19 A, 760 W	N5766A	0-40 V, 0-38 A, 1520 W	N8736A	0-40 V, 0-85 A, 3300 W	N8759A	0-100 V, 0-50 A, 5000 W
N5747A	0-60 V, 0-12.5 A, 750 W	N5767A	0-60 V, 0-25 A, 1500 W	N8737A	0-60 V, 0-55 A, 3300 W	N8760A	0-150 V, 0-34 A, 5100 W
N5748A	0-80 V, 0-9.5 A, 760 W	N5768A	0-80 V, 0-19 A, 1520 W	N8738A	0-80 V, 0-42 A, 3300 W	N8761A	0-300 V, 0-17 A, 5100 W
N5749A	0-100 V, 0-7.5 A, 750 W	N5769A	0-100 V, 0-15 A, 1500 W	N8739A	0-100 V, 0-33 A, 3300 W	N8762A	0-600 V, 0-8.5 A, 5100 W
N5750A	0-150 V, 0-5 A, 750 W	N5770A	0-150 V, 0-10 A, 1500 W	N8740A	0-150 V, 0-22 A, 3300 W		
N5751A	0-300 V, 0-2.5 A, 750 W	N5771A	0-300 V, 0-5 A, 1500 W	N8741A	0-300 V, 0-11 A, 3300 W		
N5752A	0-600 V, 0-1.3 A, 780 W	N5772A	0-600 V, 0-2.6 A, 1560 W	N8742A	0-600 V, 0-5.5 A, 3300 W		

N8900 Series autoranging high-power system supplies

Do the job of multiple power supplies with a single high-power autoranging DC power supply

- 5, 10 and 15 kW single output, autoranging programmable DC power for Automated Test Equipment (ATE) applications
- 28 models that offer up to 1500 V or 510 A
- Easily parallel to create "one" power supply with up to 100 kW of power
- Master/slave (group) operation, 10 store/recall states, Web server

N8924A

DC output ratings

5 kW models (1 phase line-to line)			10 kW models (L1, L2, L3, PE)			15 kW models (L1, L2, L3, PE)		
N8920A	80 V, 170 A	208 VAC (187 – 229 VAC)	N8925A	80 V, 340 A	208 VAC (187 – 229 VAC)	N8931A	80 V, 510 A	208 VAC (187 – 229 VAC)
N8921A	200V, 70 A		N8926A	200V, 140 A		N8932A	200V, 210 A	
N8923A	500V, 30 A		N8928A	500V, 60 A		N8934A	500V, 90 A	
N8924A	750 V, 20 A		N8929A	750 V, 40 A		N8935A	750 V, 60 A	
			N8930A	1000 V, 30 A		N8937A	1500 V, 30 A	
N8940A	80 V, 170 A	400 VAC (360 – 440 VAC)	N8945A	80 V, 340 A	400 VAC (360 – 440 VAC)	N8951A	80 V, 510 A	400 VAC (360 – 440 VAC)
N8941A	200V, 70 A		N8946A	200V, 140 A		N8952A	200V, 210 A	
N8943A	500V, 30 A		N8948A	500V, 60 A		N8954A	500V, 90 A	
N8944A	750 V, 20 A		N8949A	750 V, 40 A		N8955A	750 V, 60 A	
			N8950A	1000 V, 30 A		N8957A	1500 V, 30 A	

B2960A Series low-noise power sources

Best-in-class noise performance

– Ultra-low noise performance with the external low-noise filter (10 µVrms)
– High sourcing resolution (6.5 digit, 100 nV / 10 fA)
– Innovative sourcing capability and superior GUI

www.keysight.com/find/B2960A

B2962A

Model	Number of channels	Max. voltage	Max. current (DC)	Output noise (10 Hz to 20 MHz)	Measurement resolution
B2961A/62A Low Noise Power Source	1 or 2	210 V	3.03 A	3 mVrms	4.5 digit
B2961A/62A Low Noise Filter				350 µVrms	
B2961A/62A Ultra-Low Noise Filter)		42 V	105 mA	10 µVrms	
B2961A/62A High Current Ultra-Low Noise Filter		21 V	500 mA		

B2900A Series source measure unit (SMU)

Best-in-class source and measurement performance

– Innovative graphical user interface: I-V measurement without PC programming
– High sourcing and measurement resolution 10 fA/100 nV
– Wide output range (210 V / 3 A DC / 10.5 A pulse)
– Complimentary software control options for your application needs

www.keysight.com/find/B2900A

B2912A

Model	B2901A	B2902A	B2911A	B2912A
Number of channels	1	2	1	2
Maximum voltage	210 V			
Maximum current (DC)	3.03 A			
Output resolution	5.5 digit		6.5 digit	
Output noise (10 Hz to 20 MHz)	3 mVrms			
Measurement resolution	6½ digit			

How to evaluate low noise amplifiers

See the B2961A/62A 6.5 Digit Low Noise Power Source in action. We use voltage bias to the low noise amplifier by choosing the resistance to meet the recommended bias current. However, the problem that bias current is easily changed by environmental condition like temperature change is also indicated in the video.

Basic Electronic Measurement Series

N6705C DC power analyzer, N6781/85A SMUs, and BV9200B BenchVue Advanced Power Control and Analysis software

Deliver exceptional battery life in your devices

The N6781A and N6785A two-quadrant SMUs are designed to power, characterize, and test battery-powered devices (smart phones, tablets, and components).

- 20 V, ± 3 A, 20 W (N6781A); 20 V, ± 8 A, 80 W (N6785A)
- Stable, glitch-free sourcing and sinking (charge/eLoad)
- Seamless dynamic measurements down to nA

BV9200B BenchVue Advanced Control and Analysis software

N6705C

The N6705C DC power analyzer is an easy to use R&D tool for sourcing and measuring DC voltage and current into the DUT

- Integrates capabilities of up to four power supplies, with DMM, scope, ARB and data logger capability
- Select any combination of N6700 Series modules (page 39)
- Pair with BV9200B BenchVue Advanced Control and Analyss software to control up to four N6705 mainframes (16 power supplies) from a single PC

N6781A N6785A

NEW N6790A DC electronic load modules for N6700-series

N6791A 100 W and N6792A 200 W load can be used in a system with the N6700C/01C/02 modular power supply or on the bench with the N6705C DC Power Analyzer. Characterize power supplies, batteries, supercapacitors, and PV cells using your existing modular power supply.

- Combine power supply outputs and electronic loads in 1 U rack space
- Built-in data logger records voltages and currents eliminating the need for an external oscilloscope or multimeter.
- Constant resistance (CR), constant current (CC), constant voltage (CV), constant power (CP)

N6791A N6792A

Model	Maximum power	Voltage	Current	Number of slots used	Number of ranges
N6791A	100 W	60 V	20 A	1	2
N6792A	200 W	80 V	40 A	2	2

N3300 Series DC electronic loads

Fast electronic loads that accelerate manufacturing test

- Choose from two mainframes: The N3300A mainframe is full-rack width with 6 slots and the N3301A mainframe is half-rack width with 2 slots
- Mix and match up to 6 modules as single, parallel, or series outputs for up to 1800 W in a single mainframe
- Measure voltage and current simultaneously in constant current (CC), constant voltage (CV), and constant resistance (CR) mode
- Observe transient behavior using waveform digitization and 4,096 data point buffer

N3300A

Input ratings	N3302A	N3303A	N3304A	N3305A	N3306A	N3307A
Current	0–30 A	0–10 A	0–60 A	0–60 A	0–120 A	0–30 A
Voltage	0–60 V	0–240 V	0–60 V	0–150 V	0–60 V	0–150 V
Maximum power at 40 °C	150 W	250 W	300 W	500 W	600 W	250 W

AC6800B and 6800C Series Basic and Performance AC Power Sources

Engineer dependability into your designs with stable, reliable AC power

Test your designs with confidence, knowing that your products will perform as designed—even if they encounter fluctuating voltages from the AC power grid, extreme inrush currents, or transient spikes. Keysight's two families of AC power sources provide the capabilities you need for thorough AC testing, from basic power to more sophisticated source and measurement needs.

Both families also produce DC power, either alone or as a DC offset to an AC waveform.

AC6800 Series

6800C Series

AC6800B Series basic AC sources

A basic AC source alternative featuring stable and reliable power

- Four models, up to 4000 VA
- Intuitive user interface—if you've used a Keysight DC power supply, these will feel very familiar to you
- Flexible I/O: USB and LAN (standard), and GPIB (optional)
- Access and control the source remotely using a standard Web browser

6800C Series performance AC sources/analyzers

The complete AC power test solution

- Three models, up to 1750 VA
- Virtual front panel
- Extensive power measurement capabilities
- I/O: USB, LAN, GPIB and RS-232
- Built-in arbitrary waveform generator to simulate many types of power waveforms

	AC6800B Series Basic AC Sources				6800C Series Performance AC Sources		
	AC6801B	**AC6802B**	**AC6803B**	**AC6804B**	**6811C**	**6812C**	**6813C**
Phases	Single-phase						
Maximum output power	500 VA	1000 VA	2000 VA	4000 VA	375 VA	750 VA	1750 VA
AC output mode							
Voltage range	155 Vrms/310 Vrms				300 Vrms		
Maximum rms current	5 A/2.5 A	10 A/5 A	20 A/10 A	40 A/20 A	3.25 A	6.5 A	13 A
Maximum peak current	15 A/7.5 A	30 A/15 A	60 A/30 A	120 A/60 A	40 A	40 A	80 A
Frequency	500 Hz				1 kHz		
DC output mode							
Voltage range	219 V/438 V				425 V		
Max current	4 A/2 A	8 A/4 A	16 A/8 A	32 A/16 A	2.5 A	5 A	10 A
Max instantaneous current	12 A/6 A	24 A/12 A	48 A/24 A	96 A/48 A	40 A	40 A	80 A
Power capacity	400 W	800 W	1600 W	3200 W	285 W	575 W	1350 W
Measurements and I/O							
Measurements	Voltage, current, power				Voltage, current, power		
Transients and advanced measurements	N/A Basic transient capability via optional analog card (AC68ALGU)				Includes preprogrammed standard waveforms and transient generation system		
					AC source analyzer graphical user interface		
I/O	USB and LAN with remote Web interface Optional GPIB (AC68GPBU)				USB, LAN, GPIB and RS-232		

LCR Meters

Keysight LCR meters provide the best combination of accuracy, speed, and versatility at affordable prices for both R&D and production applications.

E4980A/AL precision LCR meter

Industry-leading combination of accuracy, speed, versatility and upgradability

- Exceptionally low noise at both low and high impedance
- 20 Hz to 2 MHz, test frequency with 4-digit resolution (E4980A)
- 20 Hz to 300 kHz / 500 kHz / 1 MHz, test frequency with 4-digit resolution (E4980AL)
- Frequency upgradable to 500 kHz or 1 MHz (E4980AL)
- 0.05% basic impedance accuracy
- 5.6 ms (SHORT), 88 ms (MED) at 1 MHz (E4980A)
- 12 ms (SHORT), 118 ms (MED) at 1 MHz (E4980AL)
- 20 Vrms test signal, 40 V DC bias, (and DC source with E4980A Option 001)
- 201-point programmable list sweep. Sweep type: frequency, OSC level, DC bias, (and DC source with E4980A Option 001)
- Open/short/load compensation
- Available material measurement software N1500A-006
- BenchVue software supported

E4981A capacitance meter

Fast, accurate, and repeatable measurement

- Ideal for reliable high-speed measurements for high-volume ceramic capacitor manufacturing
- 120 Hz / 1 kHz / 1 MHz test frequencies (E4981A-001)
- 120 Hz / 1 kHz test frequencies (E4981A-002)
- High-speed measurement: 2.3 ms (1 MHz), 3.0 ms (1 kHz), 11.0 ms (120 Hz)
- Accurate C-D testing: 0.07%, 0.0005

E4982A LCR meter

Best performance for the passive component manufacturing such as SMD inductors and EMI filters

- Four frequency options: 1 MHz to 300 MHz / 500 MHz / 1 GHz / 3 GHz, upgradable
- High-speed measurement: 0.9 ms (Mode 1), 2.1 ms (Mode 2), 3.7 ms (Mode 3)
- 0.8% basic accuracy with unparalleled measurement repeatability
- Wide impedance measurement range from 140 mΩ to 4.8 kΩ
- 1 kHz frequency resolution

Handheld Digital Multimeters

Rich features and robust design for real-world conditions

- Up to 60,000 counts and 0.025% basic DCV accuracy, accurate true-RMS AC measurements and up to 800 hours of battery life (U1280 Series)
- High-contrast OLED display with 160° viewing angle (U1273AX, U1273A, U1253B)
- Re-invented with ergonomic design and dust- and water-resistant with IP 67 (U1240C, U1280 Series), and operating temperature as low as -40 °C (U1273AX)
- CAT III 1000 V and CAT IV 600 V over-voltage protection (U1240, U1240C, U1250, U1270 and U1280 Series)

Recommended for	Model	Counts	Bandwidth	Voltage AC/DC	Current AC/DC	Battery life	Additional features	Additional features
Electrical, HVAC and utilities	U1231A	6,000	1 kHz	600 mV to 600 V	NA	500 hours	Built-in flashlight, continuity alert with flashing backlight, Z_{Low}	N/A
	U1232A				60 µA to 10 A			
	U1233A							V_{sense}*
Installation and maintenance	U1241B	10,000	2 kHz	1 V to 1000 V	1 mA to 10 A	300 hours	Switch counter	N/A
	U1242B							Harmonic ratio, dual and differential temperature measurements
	U1241C			100 mV to 1000 V		400 hours	Built-in LED flashlight	N/A
	U1242C							Harmonic ratio, dual and differential temperature measurements, V_{sense}*, Z_{Low}
Electronics troubleshooting	U1251B	50,000	30 kHz	50 mV to 1000 V	500 µA to 10 A	72 hours	NA	N/A
	U1252B		100 kHz			36 hours	20 MHz frequency counter, programmable square wave generator	
	U1253B					8 hours**		
Industrial	U1271A	30,000	20 kHz	300 mV to 1000 V	300 µA to 10 A	300 hours	Low pass filter High altitude rated (3000 m)	AC and/or DC voltage check
	U1272A		100 kHz	30 mV to 1000 V				Low impedance mode, offset compensation
	U1273A/AX					30–60 hours		
Electronics troubleshooting	U1281A	60,000	30 kHz	60 mV to 1000 V	600 µA to 10 A	800 hours	N/A	
	U1282A		100 kHz				Frequency counter, square wave output, V_{sense}*, low pass filter	

*V_{sense} is a non-contact voltage detector. ** Rechargeable.

The Remote Link solution

Safely measure, view and log test measurements up to 100 meters away from your handheld meter by simply plugging in the U1117A IR-to-*Bluetooth* adapter. Display results on the U1115A remote logging display or Windows PCs, or iOS/Android-based smart devices.

Only shippable to countries with country type approval, refer to www.keysight.com/find/hhgowireless for more information.

U1700 Series handheld capacitance and LCR meters

Save time with auto-ID and one-button access

- Auto-identification of L, C and R; and detailed component analysis with DCR, Z, ESR, D, Q and θ functions.
- Tolerance and compare modes for quick component sorting
- One-button access to measurements

U1733C

	U1701B	U1731C	U1732C	U1733C
Counts	11,000	20,000	20,000	20,000
Capacitance	1000 pF to 199.99 mF	200 pF to 20 mF	20 pF to 20 mF	20 pF to 20 mF
Inductance	N/A	200 µH to 2000 H	20 µH to 2000 H	20 µH to 2000 H
Resistance	N/A	2 Ω to 200 MΩ	2 Ω to 200 MΩ	2 Ω to 200 MΩ
Frequency	N/A	100 Hz, 120 Hz , 1 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz
Additional features	Dual display, min./max./avg. recording, data logging to PC			

Handheld clamp meters

Save money without compromising safety or convenience

Use clamp meters to measure high voltage and current (up to 1000V and 1000A) and avoid the need to disconnect high current cables. The clamp meters have built-in DMMs, with lower resolutions than typical dedicated DMMs, to be used for preventative maintenance and quick verifications.

- Large 2-inch jaw size (U1210 Series); LED light, wire separator and hook to grab the right wire (U1190 Series)
- Includes DMM capabilities: resistance, capacitance, frequency and temperature
- CAT IV 600 V and CAT III 1000 V safety ratings (U1210 Series)

U1213A

U1194A

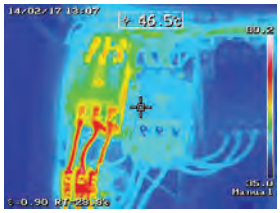
U5850 Series True*IR* thermal imagers

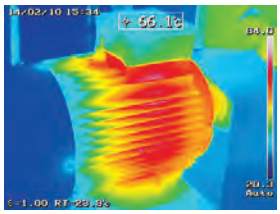
See more details with in-camera fine resolution

- Fine resolution capability delivers the clarity of 320 x 240 pixels at the cost of a 160 x 120 pixels detector. Time lapse mode takes images at preset intervals unattended.
- For distant and inaccessible targets: digital zoom magnifies by up to 4x
- Accurately measure objects as close as 10 cm (3.9 in) to distinguish close-fit components
- Compact, lightweight, ergonomic with easy-to-use customizable color palette
- High temperature range (up to 1200 °C)

True*IR*

U5857A





True*IR* images

U1450A/60A Series insulation resistance testers

Accomplish more in a day's work with Keysight insulation resistance testers

- Insulation resistance test up to 260 GΩ
- Adjustable test voltages 50, 100, 250, 500, and 1,000 V; 10 V up to 1.1 kV on select models
- Simplify test report generation with a click of a button
- Certified to IP 67, drop proof up to 3 m (10 ft), CAT III 1000V and CAT IV 600V

	U1451A	U1452A	U1452AT	U1453A	U1461A
Display type	LCD			OLED	
Insulation resistance tester features					
Insulation test voltage range	250, 500, 1,000 V	50, 100, 250, 500, 1,000 V	50, 100 V	50, 100, 250, 500, 1,000 V	
Insulation resistance range	66 GΩ	260 GΩ	66 GΩ	260 GΩ	
Earth bond resistance measurement	60 to 60K Ω			6 to 60K Ω	
Timed, PI, DAR	Timed only	√	√	√	√
Adjustable insulation test voltages	—			10 to 1.1K V	
Live circuit test inhibit	30, 50, 75 V				
Remote testing and report generation[1]	√	√	√	√	√
Multimeter features	AC / DC voltage, auto AC / DC voltage identification[2], resistance, continuity, capacitance			AC / DC voltage, auto AC / DC voltage identification[2], resistance, continuity, capacitance, diode test	AC / DC voltage (V, mV), AC / DC current (uA, mA), auto AC / DC voltage and current identification[2], resistance, continuity, capacitance, diode test, temperature, low pass filter (LPF), V_{sense}

1. Requires Keysight Handheld Logger software for Windows PC and Keysight Insulation Tester App for iOS/Android.
2. Automatically identify the signal component (AC or DC) of an electrical source.

U1600 Series handheld oscilloscopes

Maximum versatility for more rigorous troubleshooting

- 5.7-inch VGA TFT LCD display with indoor, outdoor, and night-vision viewing modes
- Two independent, isolated channels
- Up to 2 GSa/s sample rate and up to 2 Mpts deep memory to zoom in on critical details

	U1610A	U1620A
Oscilloscope channel count	2	2
Bandwidth	100 MHz	200 MHz
Maximum sampling rate	1 GSa/s interleaved, 500 MSa/s per channel	2 GSa/s interleaved, 1 GSa/s per channel
Maximum recording length	120 Kpts interleaved, 60 Kpts per channel	2 Mpts interleaved, 1 Mpts per channel
Internal scope storage	10 setups and waveforms can be saved and recalled internally	
Rise time	3.50 ns typical	1.75 ns typical
Additional features	Indoor, outdoor and night vision mode, built-in DMM, data logger capability, dual windows zoom	

Lock in Peak Performance with Keysight Extended Warranty and Calibration Plans

Ensure accurate measurements and achieve greater peace of mind with every new instrument purchase

- Get greater peace of mind — standard — with Keysight's three-year warranty
- Extend your peace of mind and eliminate budgetary surprises for up to 5 years with Extended Warranty
- Lock in OEM-quality calibration at the lowest price, with the peace of mind that your equipment will perform at its original specification with Calibration Plans

Keysight Extended Warranty and Calibration Plans are instrument options, so it's all part of the same approval process. Extended Warranty Plans are up to 70% less expensive than a comparable per-incident repair, and Calibration Plans are up to 20% less expensive than a single calibration event. Plus, you lock in today's prices to save even more. Both Extended Warranty and Calibration Plans offer a streamlined service process. All Keysight calibrations all include a full inspection and clearing to help prevent future issues.

Longer plans, on-site support, and other options are also available. To learn more see www.keysight.com/find/services

To find your local distributor of Keysight products visit
www.keysight.com/find/distributors

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