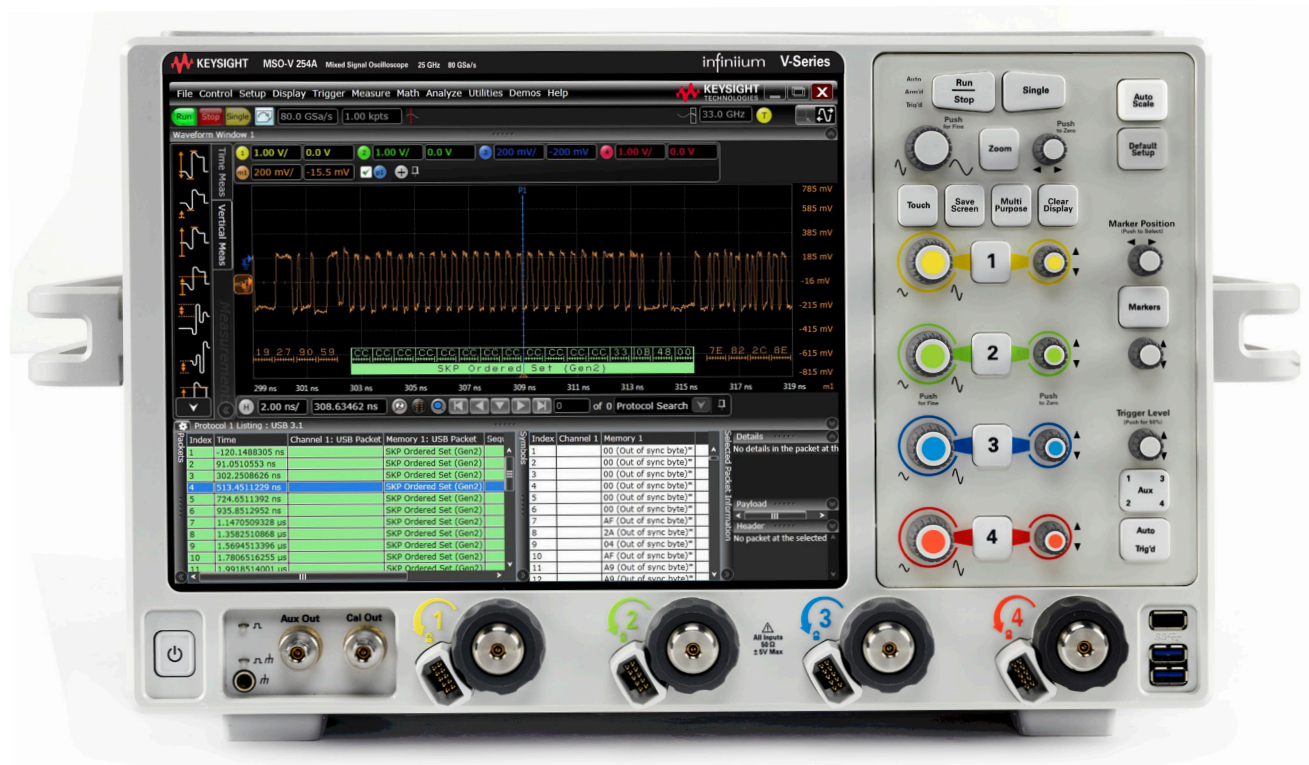


Keysight N8821A

USB 3.1 Protocol Triggering and Decode for Infiniium Series Oscilloscopes

Data Sheet



Easily Debug and Test Designs That Include USB 3.1 Protocols

Serial buses such as USB 3.1 are widely used today in electronic designs. In many designs, these serial buses provide content-rich points for debug and test. However, since these protocols transfer bits serially, using a traditional oscilloscope has limitations. Manually converting captured 1's and 0's to protocol requires significant effort. In addition, traditional scope triggers are not sufficient for specifying protocol-level conditions.

Now you can extend your oscilloscope's capability with the N8821A USB 3.1 protocol triggering and decode application. It makes it easy to debug and test USB 3.1 designs.

- Set up your scope to show USB 3.1 protocol decode in less than 30 seconds.
- Get access to a rich set of integrated software-based protocol-level triggers.
- Save time and eliminate errors by viewing packets at the protocol level.
- Use time-correlated views to quickly troubleshoot serial protocol problems back to their timing or signal integrity root cause.

Easily Debug and Test Designs That Include USB 3.1 Protocols (Continued)

30-second USB 3.1 setup

Configure your oscilloscope to display protocol decode in under 30 seconds. Use “Auto Setup” to automatically configure sample rate, memory depth and threshold and trigger levels.

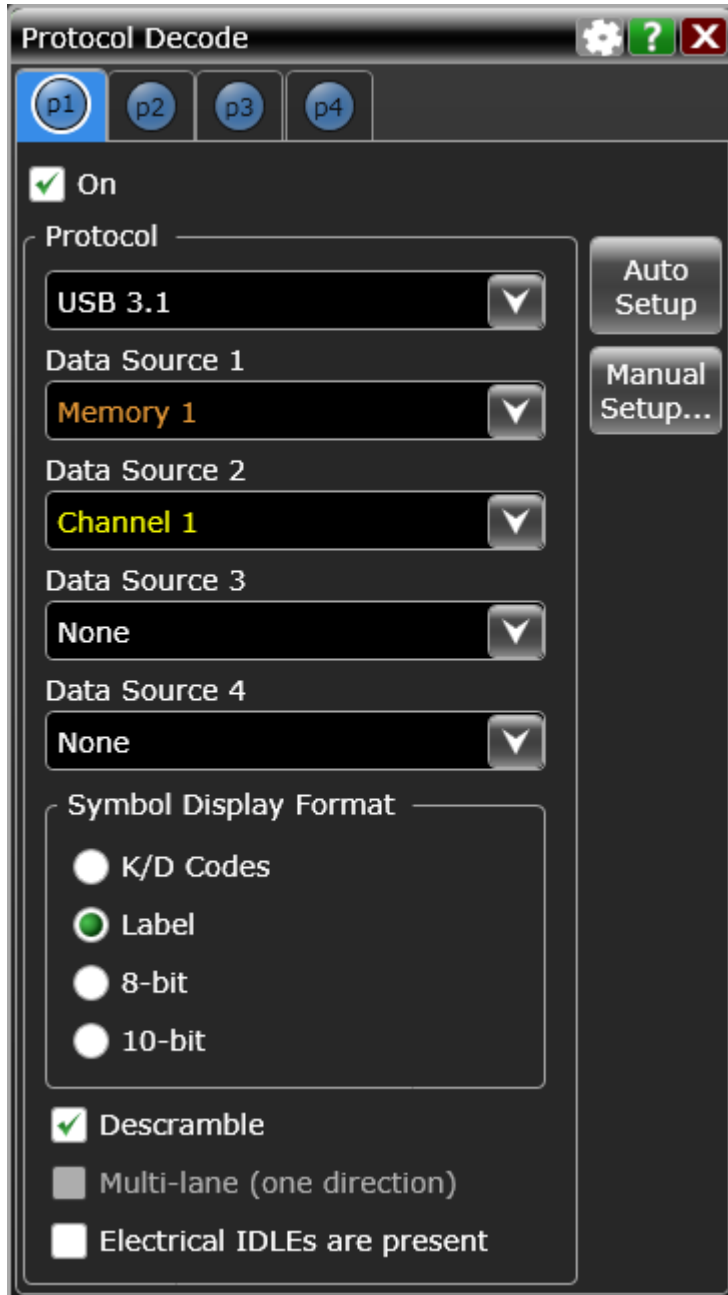


Figure 1. Configure your oscilloscope to display protocol decode in less than 30 seconds. Use “Auto Setup” to automatically configure sample rate, memory depth and threshold and trigger levels.

USB 3.1 Protocol Triggering and Searching

Get access to a rich set of integrated protocol-level triggers. The application includes a suite of configurable protocol-level trigger conditions specific to USB 3.1. The application uses software-based search triggering when serial triggering is selected.

With software-based protocol triggering, the oscilloscope takes signals acquired using scope channels and reconstructs protocol frames after each acquisition. It then inspects these protocol frames against specified protocol-level trigger conditions and triggers when the condition is met.

USB 3.1 trigger and search setup

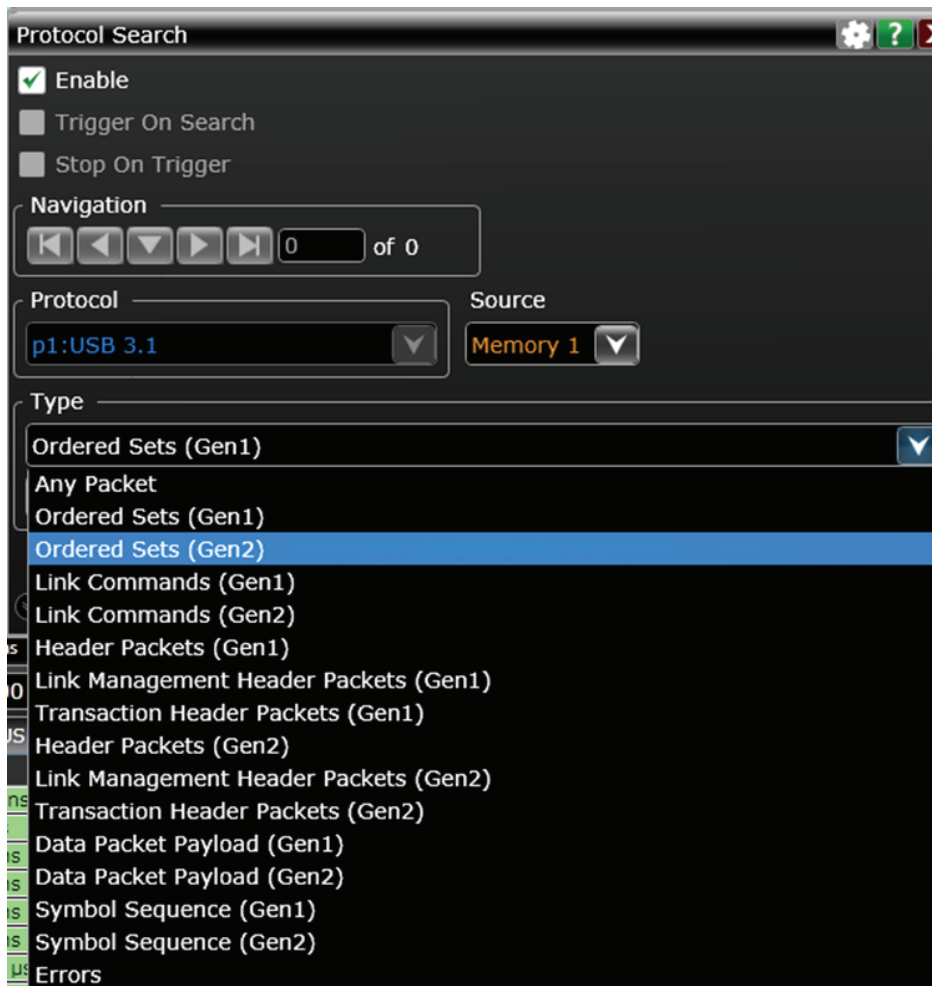


Figure 2. Choose to trigger on ordered sets, data packets, protocol errors and other packets.

USB 3.1 Protocol Triggering and Searching (Continued)

Quickly find occurrences

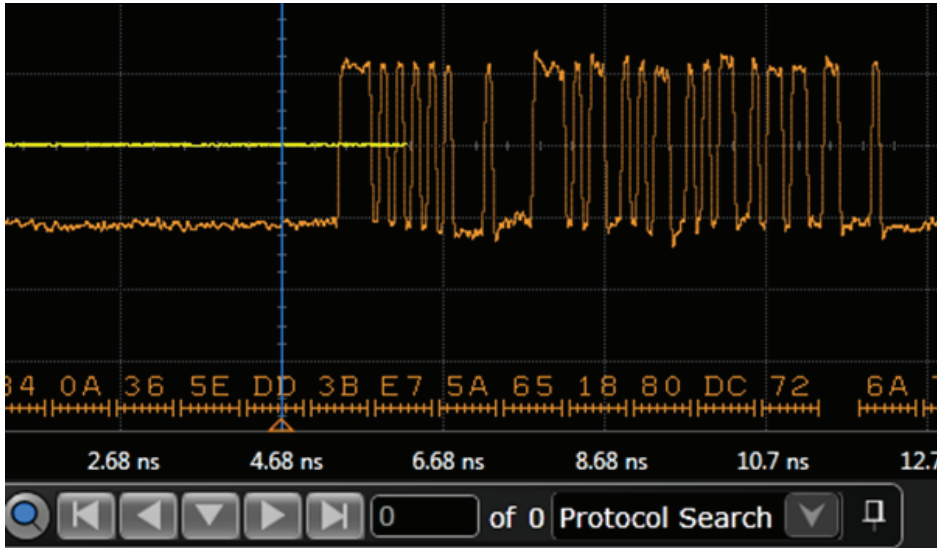


Figure 3. Quickly move to next occurrence of a specified event. Jump to the next or previous occurrence of the specified event.

USB 3.1 protocol decode

The Keysight Technologies, Inc. USB 3.1 protocol viewer includes correlation between the waveforms and the selected packet. The selected packet (highlighted blue row in the listing) is time-correlated with the blue vertical line in the waveform display. Move the blue tracking marker in time through waveforms, and the blue bar will automatically track in the packets window. Or you can scroll through the packet viewer and highlight a specific packet. The time-correlation tracking marker will move to the associated point in the waveform.

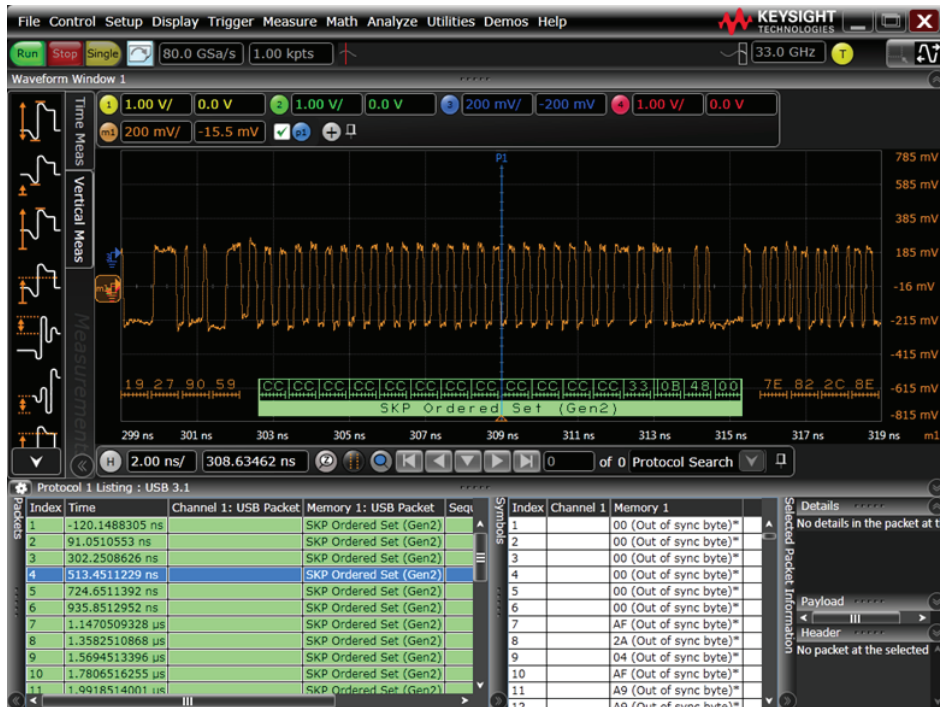


Figure 4. USB 3.1 protocol decode with precise time-correlation between waveforms and listing.

USB 3.1 Protocol Triggering and Searching (Continued)

USB 3.1 protocol decode (Continued)

Fill the entire display with compact protocol information using the full screen listing. The protocol viewer window shows the index number, time stamp value, and data content for each serial packet in the list. Scroll through all decoded serial packets to find events of interest or errors in the transmission. Data in the listing window can be saved as .csv or .txt file for offline analysis or documentation. Error packets are shown in red to help with debug.

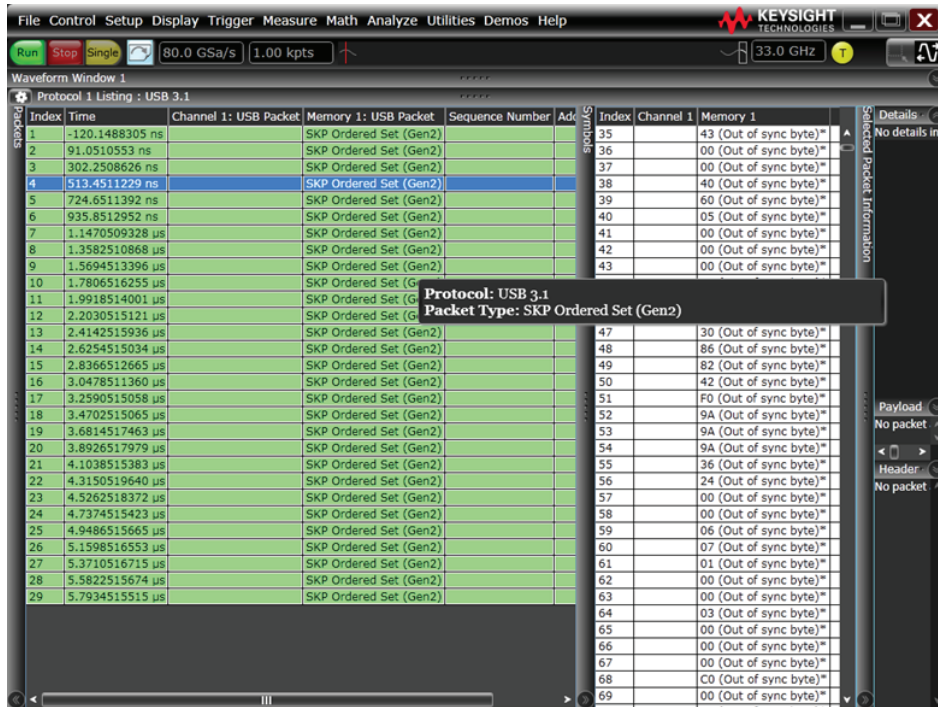


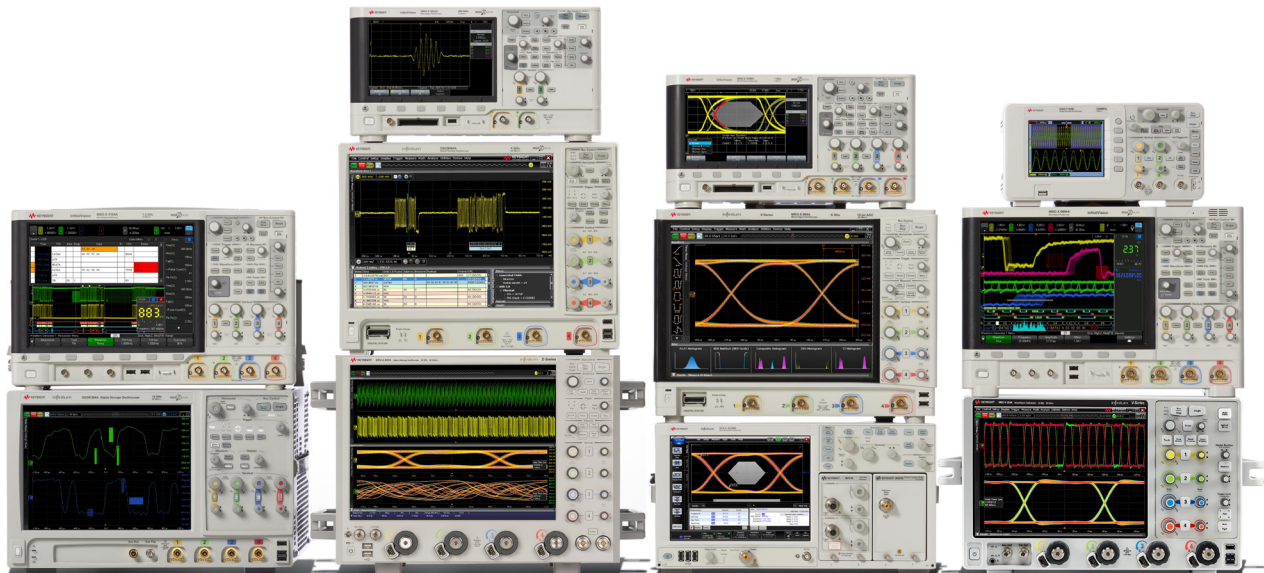
Figure 5. Full screen USB 3.1 listing.

Ordering Information

Application	License type		Infiniium V-Series and Z-Series	Infiniium S-Series	Infiniium 9000A Series	Infiniium 90000 X-Series	Infiniium 9000 Series
USB 3.1 protocol triggering and decode	Fixed	Factory-installed	N8821A-1FP	N8821B-1FP	DSO90000-086	N8821A-1FP	N8821B-1FP
		User-installed	N8821A-1FP	N8821B-1FP	N8821A-1FP	N8821A-1FP	N8821B-1FP
	Floating	Transportable	N8821A-1TP	N8821B-1TP	N8821A-1TP	N8821A-1TP	N8821B-1TP
		Server-based			N5435A-092		

Related Literature

Publication name	Publication number
Infiniium V-Series Oscilloscopes - Data Sheet	5992-0425EN



Keysight Oscilloscopes

Multiple form factors from 20 MHz to > 90 GHz | Industry leading specs | Powerful applications



www.axistandard.org

AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA for general purpose and semiconductor test. Keysight is a founding member of the AXIe consortium. ATCA®, AdvancedTCA®, and the ATCA logo are registered US trademarks of the PCI Industrial Computer Manufacturers Group.



www.lxistandard.org

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



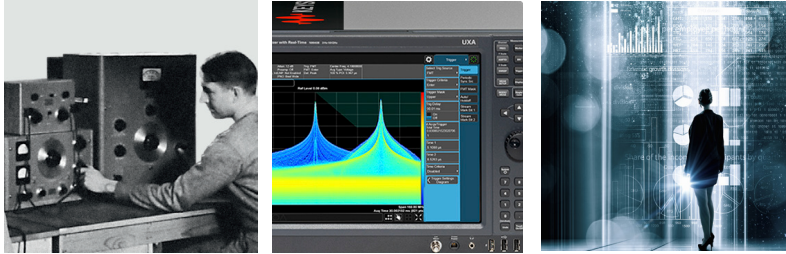
www.pxisa.org

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

Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology.

From Hewlett-Packard to Agilent to Keysight.



For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries: www.keysight.com/find/contactus (BP-9-7-17)

DEKRA Certified
ISO 9001 Quality Management System

www.keysight.com/go/quality
Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System

myKeysight

myKeysight

www.keysight.com/find/mykeysight

A personalized view into the information most relevant to you.

http://www.keysight.com/find/emt_product_registration

Register your products to get up-to-date product information and find warranty information.

KEYSIGHT SERVICES

Accelerate Technology Adoption.
Lower costs.

Keysight Services

www.keysight.com/find/service

Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.



Keysight Assurance Plans

www.keysight.com/find/AssurancePlans

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

Keysight Channel Partners

www.keysight.com/find/channelpartners

Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.



Unlocking Measurement Insights

This information is subject to change without notice.
© Keysight Technologies, 2017
Published in USA, December 1, 2017
5992-1257EN
www.keysight.com