Keysight N1046A
75/85/>100 GHz 1/2/4
Channel Remote Head Module

For 86100D Infiniium DCA-X Oscilloscope Mainframe

Data Sheet

KEYSIGHT
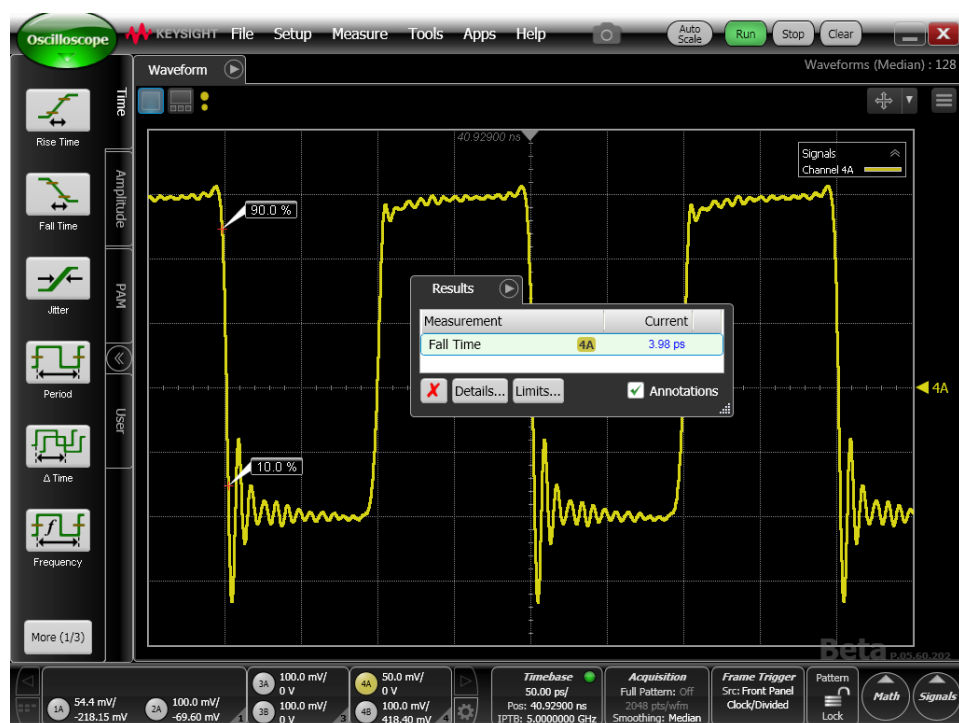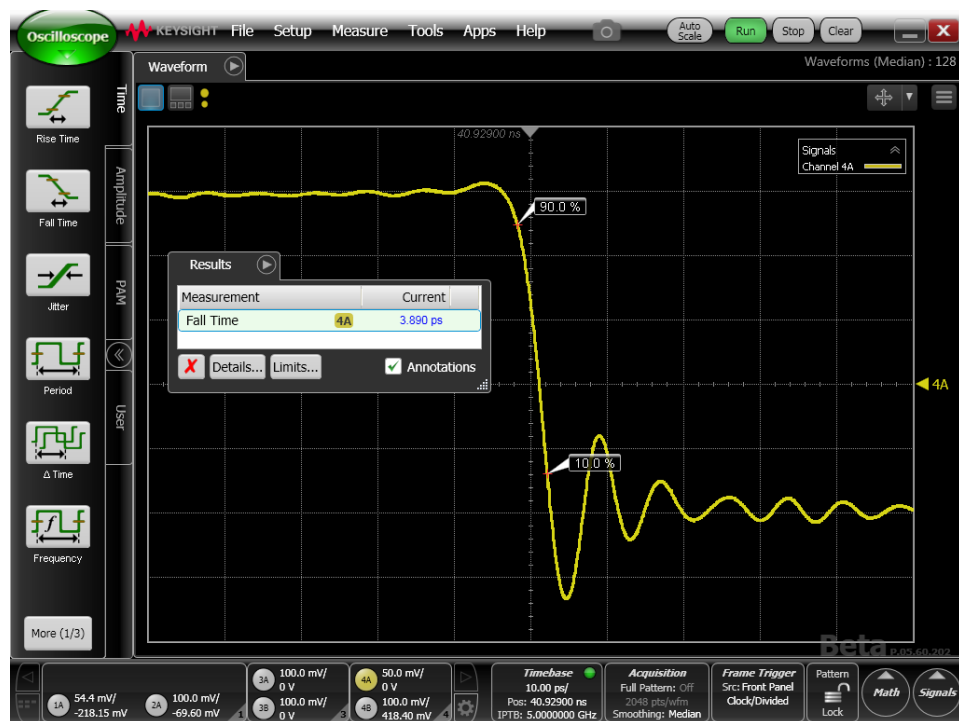TECHNOLOGIES

Unlocking Measurement Insights

Engineered for Uncompromised Performance to 100 GHz and Beyond

Characterize your highest-performance designs for 56 GBaud and beyond

Unprecedented performance
- World's highest-bandwidth equivalent time sampling oscilloscope.
- World's smallest oscilloscope remote heads enable direct or near-direct connection from the instrument to your DUT, maximizing signal integrity.
- When paired with an 86100D with option 86100D-PTB, the N1046A module has intrinsic jitter as low as 100 fs to enable accurate characterization of your device.

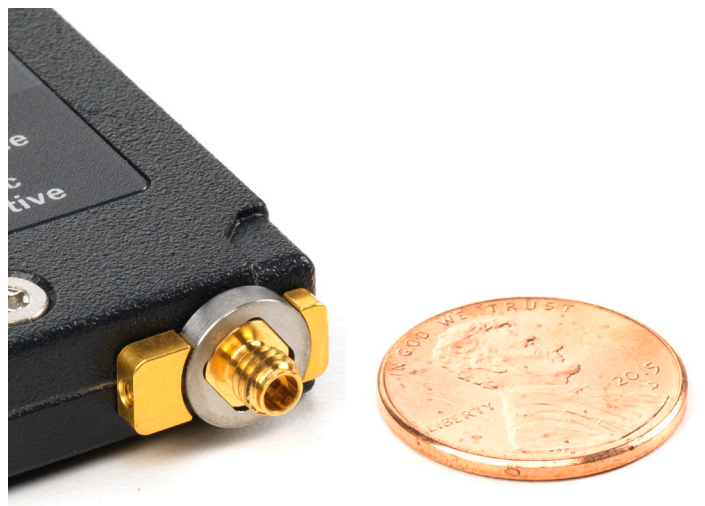# Engineered for Uncompromised Performance to 100 GHz and Beyond (Continued)

Unmatched value
- – Lowest cost > 100 GHz oscilloscope solution.
- – Bandwidth upgradable – Buy what you need today and upgrade to more performance as you need it.
- – Modular – N1046A modules are available with 1, 2 or 4 channels. Configure your system to meet your specific needs, from 1 to 16 channels with bandwidths of 75 GHz, 85 GHz or > 100 GHz. Or use the N1046A in combination with TDR and/or optical measurement modules.

Configure each module with 1, 2 or 4 channels

Choose the maximum available bandwidth to meet your current needs: 75 GHz, 85 GHz or > 100 GHz (Return-to-Keysight bandwidth upgrades are available.)

All channels come with a 1 mm (f) connector

Configuration Guide

Model option number	Description
N1046A	100 GHz, 1/2/4 port electrical remote sampling head
N1046A-71F	1 channel, 75 GHz remote head, 1 mm, female
N1046A-81F	1 channel, 85 GHz remote head, 1 mm, female
N1046A-11F	1 channel, 100 GHz remote head, 1 mm, female
N1046A-72F	2 channel, 75 GHz remote head, 1 mm, female
N1046A-82F	2 channel, 85 GHz remote head, 1 mm, female
N1046A-12F	2 channel, 100 GHz remote head, 1 mm, female
N1046A-74F	4 channel, 75 GHz remote head, 1 mm, female
N1046A-84F	4 channel, 85 GHz remote head, 1 mm, female
N1046A-14F	4 channel, 100 GHz remote head, 1 mm, female

What comes in the box?

To help you get your new high-performance scope module to work as quickly as possible, Keysight provides a long list of "standard" accessories with every N1046A:

– 1 mm (m) to 1.85 mm (f) adapters for every channel
– A torque wrench for 1 mm connectors
– A torque wrench for 1.85 mm connectors
– Cable management clips to manage/dress the remote head cables
– For modules with > 1 channel, clips to hold two heads together
– A case to hold all of the above

Other accessories you may need

Model	Description
11920A	1 mm (m) to 1 mm (f)
11920B	1 mm (f) to 1 mm (f)
11920C	1 mm (m) to 1 mm (f)
11921E	1 mm (m) to 1.85 mm (m)
11921F	1 mm (f) to 1.85 mm (f)
11921G	1 mm (m) to 1.85 mm (f)
11921H	1 mm (f) to 1.85 mm (m)

Specifications

Specifications describe warranted performance while characteristics provide useful, nonwarranted information and performance. Characteristics are listed below in italics.

Multiple electrical channel modules		N1046A	
Channel options	71F/72F/74F	81F/82F/84F	11F/12F/14F
Number of channels	1/2/4	1/2/4	1/2/4
Electrical channel bandwidth (maximum) [1]	75 GHz	85 GHz	100 GHz
Electrical channel bandwidth settings (user-selectable)	45, 60, 75 GHz	45, 60, 75, 85 GHz	45, 50, 75, 85, 100, *122 GHz* (*characteristic*)
Transmision time (10 to 90% calculated from TR = 0.35/bandwidth)	7.8, 5.9, 4.7 ps	7.8, 5.9, 4.7, 4.2 ps	7.8, 5.9, 4.7, 4.2, 3.5, < *3.2 ps*
Channel-to-channel skew range	± 100 ps	± 100 ps	± 100 ps
RMS noise			
Characteristic	*400, 580, 740 µV*	*400, 580, 740, 860 µV*	*400, 580, 740, 860, 1005, 2000 µV*
Maximum	550, 700, 950 µV	550, 700, 950, 1150 µV	550, 700, 950, 1150, 1350, *2000* (*characteristic*) µV
Scale factor (per division)			
– Minimum	1 mV/division	1 mV/division	1 mV/division
– Maximum	100 mV/division	100 mV/division	100 mV/division
DC accuracy (V_{AVG} measurement)			
– Specified at calibration temperature ± 0.5 °C. (Perform a new module calibration if hardware skew has been applied.)	± *2 mV* (*characteristic*)		
– Specified at calibration temperature ± 5 °C	± 2 mV ± 4% of (reading – channel offset)		
DC offset range (referenced from center of screen)	± 500 mV	± 500 mV	± 500 mV
Input dynamic range (relative to channel offset)	± 400 mV	± 400 mV	± 400 mV
Maximum input signal	± 2V (+16 dBm)	± 2V (+16 dBm)	± 2V (+16 dBm)
Nominal impedance (*characteristic*)	*50 Ω*	*50 Ω*	*50 Ω*

How Does Keysight Test and Setup your Module?

The N1046A bandwidth is tested using a very fast electrical impulse that is generated by a photodiode driven by a femtosecond optical impulse source. The high bandwidth photodiode is calibrated and NIST traceable through 110 GHz. For frequencies beyond 110 GHz, photodiode performance is based on a linear extrapolation of the photodiode response through 110 GHz but test data beyond 110 GHz is not provided.

User note:
For customers needing the maximum possible bandwidth, the 122 GHz setting is recommended. For customers needing high bandwidth with "matched" performance across channels, the 100 GHz setting is recommended.

1. Tuned to be −3 dB (± measurement uncertainty) at stated bandwidth(s) EXCEPT for the 122 GHz setting which is tuned for maximum bandwidth while keeping channel noise ≤ 2.5 mV RMS.

www.axiestandard.org

AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA for general purpose and semiconductor test. The business that became Keysight was 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. The business that became Keysight was a founding member of the LXI consortium.
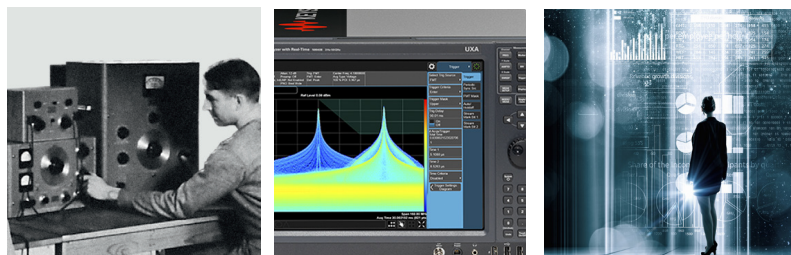
www.pxisa.org

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

Evolving

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

From Hewlett-Packard to Agilent to Keysight

myKeysight
www.keysight.com/find/mykeysight
A personalized view into the information most relevant to you.

Keysight Services
www.keysight.com/find/service
Our deep offering in design, test, and measurement services deploys an industry-leading array of people, processes, and tools. The result? We help you implement new technologies and engineer improved processes that lower costs.

Three-Year Warranty
www.keysight.com/find/ThreeYearWarranty
Keysight's committed to superior product quality and lower total cost of ownership. Keysight is the only test and measurement company with three-year warranty standard on all instruments, worldwide. And, we provide a one-year warranty on many accessories, calibration devices, systems and custom products.

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.

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-2-23-17)

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

KEYSIGHT TECHNOLOGIES

Unlocking Measurement Insights