Keysight Technologies DCA Accessories

Technical Overview





N1027A-45A Accessory Kit for Remote Head Modules

Kit consists of:

Quantity	Part number	Description
1	8710-1582	0.57 Nm (5 lb-in) torque wrench
2	N1027A-1PB	Remote head brackets
2	11901C	2.4 mm male to 3.5 mm female adapter
2	N9398G	1.85 mm DC block
2	N5520A	1.85 mm male-to-male adapter
2	N5520B	1.85 mm female-to-female adapter
2	N1027A-1C1	1.85 mm cable
1	9300-1367	ESD wrist strap
1	9300-0980	ESD ground cord
1	N1027A-1AC	Accessory case



N1027A-46A Accessory Kit for Remote Head Modules

Quantity	Part number	Description
2	11901C	Adapter, 2.4 mm male to 3.5 mm female
2	11920A	1.0 (m) to 1.0 (m) adapter
2	11921E	1.0 (m) to 1.85 (m) adapter
2	11921G	1.0 (m) to 1.85 (f) adapter
4	5022-6494	Bracket, remote head probe
1	8710-1582	Torque wrench 5/16 in (5 in-lbs)
1	8710-2079	Torque wrench 6 mm (4 in-lbs)
1	9300-0980	ESD ground cord
1	9300-1367	ESD wrist strap
2	N1027-20001	Coaxial cable, 1.85 mm connectors, 100 mm
2	N9398G	1.85 mm DC block 16V 700 kHz to 67 GHz
1	N1046-40003	Accessory case for N1046A demo kit

TDR Calibration

Part number	Description
85058B	Standard mechanical calibration kit, DC-67 GHz, for 1.85 mm applications
85058E	Economy mechanical calibration kit, DC-67 GHz, for 1.85 mm applications
85056A	Standard mechanical calibration kit, DC-50 GHz, for 2.4 mm applications
85056D	Economy mechanical calibration kit, DC-50 GHz, for 2.4 mm applications
N1024B	Mechanical calibration kit for 3.5 mm applications
N4694A-HFF	DC-67 GHz Electronic calibration module with female 1.85 mm connectors ¹
N4694A-HMF	DC-67 GHz Electronic calibration module with one male and one female 1.85 mm
	connector
N4694A-HMM	DC-67 GHz Electronic calibration module with male 1.85 mm connectors ²
N1027A-34F	Accessory kit for 35 GHz N1055A-32F/34F TDR/TDT module
N1027A-34M	Accessory kit for 35 GHz N1055A-32M/34M TDR/TDT module
N1027A-54F	Accessory kit for 50 GHz N1055A-52F/54F TDR/TDT module
N1027A-54M	Accessory kit for 50 GHz N1055A-52M/54M TDR/TDT module





N1027A-54F

- Directly connects to N1055A-52M/54M remote heads.
 Directly connects to N1055A-52F/54F remote heads.

N1027A-### quantities

-34F	-34M	-54F	-54M	Part number	Description
1		1		N4694-61002	DC-67 GHz Electronic calibration module with male 1.85 mm connectors
	1		1	N4694-61003	DC-67 GHz Electronic calibration module with female 1.85 mm connectors
	2	4		11901-60003	2.4 mm male to 3.5 mm female adapter
2			4	11901-60004	2.4 mm female to 3.5 mm male adapter
1				85052-60014	3.5 mm male to 3.5 mm male adapter
	1		·	85052-60012	3.5 mm female to 3.5 mm female adapter
		1		85058-60113	1.85 mm male-to-male adapter
			1	85058-60114	1.85 mm female-to-female adapter
1	1	1	1	9300-1367	ESD wrist strap
1	1	1	1	9300-0980	ESD ground wire
4	4	4	4	5022-6494	Bracket for remote head
1	1	1	1	8710-1764	0.9 nm (8 lbs-in) torque wrench, 20 mm
1	1	1	1	8710-1765	0.9 nm (8 lbs-in) torque wrench, 5/16 inch
1	1	1	1	8121-0506	USB cable (part of ECal)
1				85052-60006	3.5 mm male short
1				85052-60008	3.5 mm male open
1				00902-60003	3.5 mm male load
	1		,	85052-60007	3.5 mm female short
	1			85052-60009	3.5 mm female open
	1			00902-60004	3.5 mm female load
		1		N1027A-2AC	Accessory case
			1	N1027A-3AC	Accessory case
1				N1027A-4AC	Accessory case
	1			N1027A-5AC	Accessory case

Clock Recovery Phase Matching Cable Kits

N1076A-CR1 electrical clock recovery phase matching kit (Ordered separately as N1027A-76A)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate jitter measurements when using the N1076A external clock recovery. It is designed for the following DCA configuration: an 86100D with Option PTB, the N1076A external clock recovery module and the N1045A 60 GHz electrical module and/or N1055A 50 GHz TDR module.

Quantity	Part number	Description
2	N1027A-3C1	Coaxial cable, 2.92 mm (m) to 2.92 mm (m),
		0.55m length
2	N1027A-3C2	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 1 m
		length
1	N1027A-DC1	Delay-line assembly, 18.2 ns
1	N1027A-2P2	Microwave pick-off tee, 2.4 mm connectors,
		matched pair
2	N1027A-EQ6	Microwave equalizer, 0.5 to 18 GHz, 6 dB
		negative slope, SMA
2	N1027A-EQ9	Microwave equalizer, 0.5 to 18 GHz, 9 dB
		negative slope, SMA
1	8710-1615	T-20 Torx screwdriver
1	8710-1623	T-10 Torx screwdriver
1	8710-1765	Torque wrench, 8 lb-in, 5/16 Inch



This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate measurements when using the N1077A external clock recovery. It is designed to be used with an 86100D DCA-X mainframe with Option ETR/PTB installed (with any DCA plug-in module) or any N109x Series DCA-M product.

Quantity	Part number	Description
1	N1077-60011	FC/PC optical cable, 50/125 μm (multimode), 1.0 m length
1	N1077-60012	FC/PC optical cable, 50/125 μm (multimode), 2.6 m length
1	N1077-60013	FC/PC optical cable, 50/125 μm (multimode), 4.75 m length
1	N1077-60008	FC/PC optical cable, 9/125 μm (single-mode), 1.0 m length
1	N1077-60009	FC/PC optical cable, 9/125 μ m (single-mode), 3.5 m length
1	N1077-60010	FC/PC optical cable, 9/125 μm (single-mode), 5.6 m length
2	N1075-60017	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 1 m length
1	N1077-60005	Coaxial cable, 2.92 mm (m) to 2.92 mm (m), 12 in. length
1	N1027A-EQ6	Microwave equalizer, 0.5 GHz to 18 GHz, 6 dB, negative slope, SMA
1	N1027A-EQ9	Microwave equalizer, 0.5 GHz to 18 GHz , 9 dB, negative slope, SMA







Clock Recovery Phase Matching Cable Kits (Continued)

N1027A-MC1

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate jitter measurements when using the N4877A external clock recovery. The N1027A-MC1 works with an 86100D with Option PTB, the N4877A external clock recovery module and the N1045A 60 GHz electrical module and/or N1055A 50 GHz TDR module.

Quantity	Part number	Description
2		50 GHz pick-off
2	11901D	3.5 mm male to 2.4 mm female
1	N1027-60011	Cable set (4 pieces)
1	N1027-60009	Precision time base strobe delay cable
1	N1027-00001	Strobe delay cable cover
1	N1027-00002	Strobe delay cable lid
1	1870-1625	20x100 Torx driver
1	1870-1623	10x100 Torx driver
1	8710-1765	8 in-lb, 5/16 Torque wrench

To connect the N4877A recovered clock output to the 86100C/D trigger input and to connect the N4877A auxiliary output with an optional 86107A precision timebase.

Adapters and Connector Savers

Description below specifies gender of adapter

Part number	Description
11920A	1.0 male to 1.0 male adapter
11920B	1.0 female to 1.0 female adapter
11920C	1.0 male to 1.0 female adapter
11921E	1.0 male to 1.85 male adapter
11921F	1.0 female to 1.85 female adapter
11921G	1.0 male to 1.85 female adapter
11921H	1.0 female to 1.85 male adapter
N5520A	1.85 mm male to 1.85 mm male adapter/connector saver

N5520A	1.85 mm male to 1.85 mm male adapter/connector saver
N5520B	1.85 mm female to 1.85 mm female adapter/connector saver
N5520C	1.85 mm female to 1.85 mm male connector saver

11900A	2.4 mm male to 2.4 mm male adapter/connector saver ¹
11900B	2.4 mm female to 2.4 mm female adapter/connector saver ¹
11900C	2.4 mm female to 2.4 mm male connector saver ¹
11901A	2.4 mm male to 3.5 mm male adapter 1,2
11901B	2.4 mm female to 3.5 female adapter 1,2
11901C	2.4 mm male to 3.5 mm female adapter 1,2
11901D	2.4 mm female to 3.5 mm male adapter 1,2
11903A	2.4 mm male to type-N male adapter 1,2
11903B	2.4 mm female to type-N female adapter ^{1,2}
11903C	2.4 mm male to type-N female adapter 1,2
11903D	2.4 mm female to type-N male adapter 1,2
11904A	2.4 mm male to 2.92 mm male adapter 1,2
11904B	2.4 mm female to 2.92 female adapter 1,2
11904C	2.4 mm male to 2.92 mm female adapter 1,2
11904D	2.4 mm female to 2.92 mm male adapter 1,2

85130-60010	2.4 mm female to 3.5 mm male NMD bulkhead adapter 1,2
83059A	3.5 mm male to 3.5 mm male adapter/connector saver ¹
83059B	3.5 mm female to 3.5 mm female adapter/connector saver ¹
83059C	3.5 mm female to 3.5 mm male connector saver ¹
5062-1247	3.5 mm male bulkhead to female 3.5 mm/SMA adapter ²

- 2.4 mm connectors are mechanically compatible with 1.85 mm.
 2.92 mm connectors are mechanically compatible with 3.5 mm and SMA connectors.

Examples

- Use two 11901Cs to connect SMA cables to an N1045A-02F or 86108B-HBW or N4903B.
- Use 5061-5311 as a connector saver for the 86112A, 54754A or 86105X electrical inputs.
- Use 11900A plus 5062-1247, plus N1022B, plus 1143A to connect InfiniiMax II probes with the N1045-0xF.



11900B



11901C



85130-60010 2.4 F -3.5 M



5061-5311

DC Blocks, Phase Trimmers, Cables, Caps

Part number	Description
N9398G	1.85 mm male-to-female DC block 16 V 700 kHz to 67 GHz ¹
N9398F	2.4 mm male-to-female DC block 16 V 50 kHz to 50 GHz ¹
N9398C	3.5 mm male-to-female DC block 16 V 50 kHz to 26.5 GHz $^{\rm 2}$
N1027A-PT2	2 / mm male to famale phase trimmer range \ 22 pa
NIUZ/A-PIZ	2.4 mm male-to-female phase trimmer, range > 22 ps,
	IL ≤ 0.8 dB at 50 GHz ¹
N1027A-PT3	SMA female-to-female, range > 53 ps, IL ≤ 0.8 dB at 26 GHz ²
N1027A-1C1	1.85 mm coaxial male-to-male cable, 67 GHz, 10 cm ¹
N1027A-1CF	Shipping cap to protect 1.85/2.4 mm female inputs ¹
N1027A-1CM	Shipping cap to protect 1.85/2.4 mm male inputs ¹
N1027A-3CF	Shipping cap to protect 2.92/3.5 mm female inputs ²
N1027A-3CM	Shipping cap to protect 2.92/3.5 mm male inputs ²



^{2.92} mm connectors are mechanically compatible with 3.5 mm and SMA connectors.



N9398F



N1027A-PT2

Example

– The N1045A-04F requires four N1027A-1CF caps, the N1055A-32M requires two N1027A-3CM caps.

Attenuators, Terminations

8.5 mm 3 dB attenuator 8.5 mm 6 dB attenuator 8.5 mm 10 dB attenuator 8.5 mm 20 dB attenuator
3.5 mm 10 dB attenuator
3.5 mm 20 dB attenuator
2.4 mm 3 dB attenuator
2.4 mm 6 dB attenuator
2.4 mm 10 dB attenuator
2.4 mm 20 dB attenuator
3.5 mm female 50 Ω load
3.5 mm male 50 Ω load
3.5 mm male short
2.4 mm male $50~\Omega$ load
2.4 mm female $50~\Omega$ load
2.4 mm male short
2.4 mm female short



8493C



8490D



909D-011



85138A

85140B



Power Dividers, Splitters

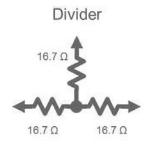
2.4 mm male open

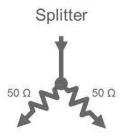
2.4 mm female open

85141A

85141B

Part number	Description
11636B	3.5 mm power divider, DC to 26.5 GHz
11636C	2.4 mm power divider, DC to 50 GHz
11667B	3.5 mm power splitter, DC to 26.5 GHz
11667C	2.4 mm power splitter, DC to 50 GHz









Storage

See also www.keysight.com/find/parts

Part number	Description
N1000-40008	Front cover for 86100D ¹
N1027A-1AC	Accessory case ²
N1027A-2AC	Empty N1027A-54F accessory case
N1027A-3AC	Empty N1027A-54M accessory case
N1027A-4AC	Empty N1027A-34F accessory case
N1027A-5AC	Empty N1027A-34M accessory case
N1027A-1MC	Module storage case for N1045A module
N1027A-3MC	Module storage case for N1055A module
N1027A-1CL	Clip for two N1045A cables
N1027A-2CL	Clip for two N1045A or N1055A remote heads
N1027A-1PB	Bracket for one N1045A or N1055A remote head



- 1. Does not fit 86100A/B/C mainframes.
- 2. Empty N1027A-45A case (see photo on page 2).
- Use filler panels to ensure proper airflow through the inside of modules.
 Otherwise the movement of air may be cut short, and components may overheat in hot environments.
- 4. The 86100D always ships with two filler panels to fill two slots. Mini-modules ship with one filler panel.



N1000-40008



N1027A-1MC/3MC



N1027A-1CL



86101-60017



N1027A-2CL

ESD Protection

Part number	Description
N9355CK01	3.5 mm DC coupled limiter
0000 1000	500
9300-1308	ESD heel strap
9300-1367	ESD wrist strap
9300-0980	ESD ground cord
9300-1484	ESD desk mat





Rackmount Kits, Tools

Part number	Description
1CM030A	Rackmount kit for 86100A/B/C
1CP018A	Rackmount kit with handles for 86100A/B/C
101/0154	Dealine wet hit for 0C100D
1CM015A	Rackmount kit for 86100D
1CP020A	Rackmount kit with handles for 86100D
8710-1582	0.57 nm (5 lbs-in) torque wrench 1
8710-1765	0.9 nm (8 lbs-in) torque wrench ²
8710-1764	0.9 nm (8 lbs-in) torque wrench ³
	-

- Recommended for 1.85/2.4 mm DCA connectors (e.g. N1045A, 86116C, 86118A)
- 2. Recommended for 3.5 mm DCA connectors (e.g. 54754A, 86105x, 86112A).
- 3. Recommended for DCA bulkheads (e.g. 86100x trigger input, 54754A, 86105x, 86112A).









InfiniiMax III/III+ Probing System Overview

Probe amps

- 16 to 30 GHz (InfiniiMax III)
- 4 to 20 GHz (InfiniiMax III+) with InfiniiMode
- Industry's highest fidelity and accuracy
- Bandwidth upgradable (InfiniiMax III)

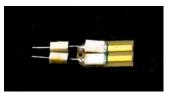


InfiniiMax III probe amps (N2800A-03A) 16 GHz, 20 GHz, 25 GHz, 30 GHz



InfiniiMax III+ probe amps (N2830A-32A) 4 GHz, 8 GHz, 13 GHz

InfiniiMax III/III+ probe heads and accessories







InfiniiMax III 16 GHz QuickTip head



N5439A ZIF probe head N5440A 28 GHz 450 Ω ceramic tips N5447A 28 GHz 200 Ω ceramic tips



N5444A 2.92 mm/3.5 mm/SMA 28 GHz probe adapter



N5445A 30 GHz browser



N5441A 16 GHz solder-in probe head



N2836A 26 GHz solder-in probe head

InfiniiMax III probe adapters



N5477A Sampling oscilloscope adapter



Hi-impedance probe adapter



N5442A Precision BNC 50 Ω adapter



N5443A Performance verification and deskew fixture

Using InfiniiMax III Probe with DCAs

- For directly connecting to any DCA module with a 3.5 mm bulkhead connector: Use N5477A sampling oscilloscope adapter to InfiniiMax III probes.
- For directly connecting to any DCA module with a 2.4 mm bulkhead connector: Use N1022B plus 85130-60010 2.4 mm (f) to 3.5 mm (m) NMD adapter.
- For directly connecting to any DCA remote head with an 1.85 or 2.4 mm female input, use N5477A plus 5062-1247 female bulkhead to 3.5 mm female adapter plus 11901A 3.5 mm male to 2.4 mm male adapter.
- For modules that do not have built-in probe power: Add an 1143A probe power supply with Option 001.
- N5477A plus InfiniiMax III N2803A probe provides 30 GHz bandwidth.





1143A

N5477A sample oscilloscope adapter for InfiniiMax III.

Using InfiniiMax I/II Probe with DCAs

Required accessories and instruments:

- For directly connecting to any DCA module with a 3.5 mm bulkhead connector: N1022B.
- For directly connecting to any DCA module with a 2.4 mm bulkhead connector: N1022B plus 85130-60010.
- For modules that do not have built-in probe power: A\dd an 1143A probe power supply with Option 001.
- E2655C performance verification and deskew fixture for probe calibration and performance verification.

Typical 1134A configuration for 86117A

Quantity	Part number	Description	
1	1134A	7 GHz probe amp	
1	E2669A	Differential connectivity kit	
1	N1022B	Probe adapter	
1	85130-60010	2.4 to 3.5 mm adapter	
1	1143A	Probe power supply	
1	Option 001	5-foot power extension cable	
1	E2665C	Calibration/deskew fixture	

N1021B 18 GHz Differential TDR/TDT Probe Kit

Quantity	Description	Replacement
1	Differential TDR probe	_
1	Pair of matched cables (1 m)	N1021-60003
2	SMA short (m)	0960-0055
2	SMA load 50 Ω (m)	1810-0118
2	SMA adapter (f-f)	1250-1666
1	Adapter to positioners (includes two 2.5 mm screws and	N1021-60008
	one Allen wrench)	
1	ESD wrist strap	9300-1367
1	ESD wrist strap ground cord	9300-0980
1	ESD warning label stickers	_
1	User's Guide (either printed or on CD)	_
1	Box with foam insert	_



Optical Interfaces

DCA modules (8610XX, 8611XX, 83496X, N107XX)

- Have removable connector interfaces
- Ship with 81000FI FC/PC pre-installed
- Compatible with 81000xl interfaces shown here (sold separately)

Internal fiber tip is mini HMS-10 ferrule

- Requires patchcords with straight physical contact (DIN, E2000, FC/PC, LC, MU, SC, or ST connector)
- Easy to clean just unscrew the connector interface



81000FI - FC/PC (Ships standard with all optical inputs on modules for the DCA family)



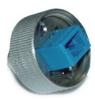
81000LI - LC



81000KI - SC



81000HI - E2000



81000MI - MU



81000SI - DIN4108/47256

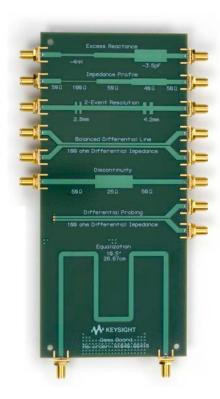


81000VI - ST

Training Tools and Devices

Available from www.keysight.com/find/parts

Part number	Description
N1040-66410	TDR/TDT, equalization and de-embedding demo board



Appendix: DCA Input Connectors

Product	Probe power	3.5 mm	2.4 mm	2.92 mm	1.85 mm	1.00 mm	Optical	Comment
54754A	Yes	f/f CS						
83496B	No	f/f CS					FC/PC nut	
86100C/D	No	f/f CS						Trigger input
86105C	No	f/f CS					FC/PC nut	
86105D	No	f/f CS	f/f CS				FC/PC nut	2.4 mm for option 281
86107A	No	f/f CS	f/f CS					2.4 mm only on 40 GHz input
86108A	Yes	f/f CS						
86108B	Yes	f/f CS	f/f CS					2.4 mm only on 50 GHz input
86112A	Yes	f/f CS						
86115D	No						FC/PC nut	
86116C	No				m fixed		FC/PC nut	
86117A	No		f/f CS					
86118A	No				ffixed			
N1045A-xxF	No				ffixed			
N1045A-xxM	No				m fixed			
N1046A-xxF						ffixed		Includes 1.0/1.85 mm adapter(s)
N1055A-3xF	No			ffixed				
N1055A-3xM	No			m fixed				
N1055A-5xF	No				ffixed			
N1055A-5xM	No				m fixed			
N1076A	No			ffixed				
N1077A	No			f fixed			FC/PC	
N1090A	No	fSMA					FC/PC	
N2092A/B/D	No						FC/PC	
N1092C/E	No		f/f CS				FC/PC	
N1094A/B	No		f/f CS					Option 030 includes 2.4/2.92 mm adapters

f/f CS Female/female connector saver (bulkhead is male, customer can remove connector saver) m/m CS Male/male connector saver (bulkhead is female, customer can remove connector saver)

f fixed Female fixed interface m fixed Male fixed interface

FC/PC nut 86100FI straight FC/PC interface (customer can exchange it with interfaces, see Optical Interfaces in the Technical Overview on

www.keysight.com/find/N1027A)

f SMA Female SMA input (fixed) FC/PC Cleanable FC/PC adapter

DCA-M clock Use 2.92 or 3.5 mm cables to provide clocks to the N1090X, N1092X and N1094X DCA-M oscilloscopes

Appendix: RF/Microwave Connectors

3.5 mm connector

The 3.5 mm connector was primarily developed at Hewlett Packard (now Keysight Technologies, Inc.) with early manufacturing at Amphenol. Its design strategy focused on highly-rugged physical interfaces that would mate with popular SMA dimensions, allowing thousands of repeatable connections. It is mode-free to 34 GHz.

2.92 mm connector

The 2.92 mm connector mates with SMA and 3.5 mm connectors and offers mode-free performance to 40 GHz.

2.4 mm connector

The 2.4 mm connector was developed by Hewlett Packard, Amphenol, and M/A-COM for use to 50 GHz. This design eliminates the fragility of the SMA and 2.92 mm connectors by increasing the outer wall thickness and strengthening the female fingers. It can mate with SMA, 3.5 mm and 2.92 mm, with the use of precision adapters. The 2.4 mm product is offered in three quality grades: general purpose, instrument, and metrology. General-purpose grade is intended for economy use on components, cables, and microstrip where limited connections and low repeatability is acceptable. Instrument-grade is best suited for measurement applications where repeatability and long life are primary considerations. Metrology-grade is best suited for calibration applications where the highest performance and repeatability are required.

1.85 mm connector

The 1.85 mm connector was developed in the mid-1980s by Hewlett Packard (now Keysight Technologies, Inc.) for mode-free performance to 65 GHz. Hewlett Packard offered its design as public domain in 1988 to encourage standardization of connector types; a few devices are available from various manufacturers for research work. The 1.85 mm connector mates with the 2.4 mm connector and has the same ruggedness. In recent years, the 1.85 mm connector has been optimized to operate mode-free to 67 GHz.

Appendix: Literature References

Publication title	Publication number
Infiniium DCA-X 86100D Wide-Bandwidth Oscilloscope Mainframe and	5990-5824EN
Modules - Data Sheet	
(www.keysight.com/find/dcax)	
RF and Microwave Test Accessories Catalog 2012/2013 - Catalog	5990-8661EN
(www.keysight.com/find/mta)	
Using the Keysight N5477A Sampling Oscilloscope Adapter	N5477-97000



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.



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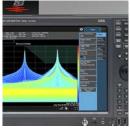


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Evolving

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







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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.



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