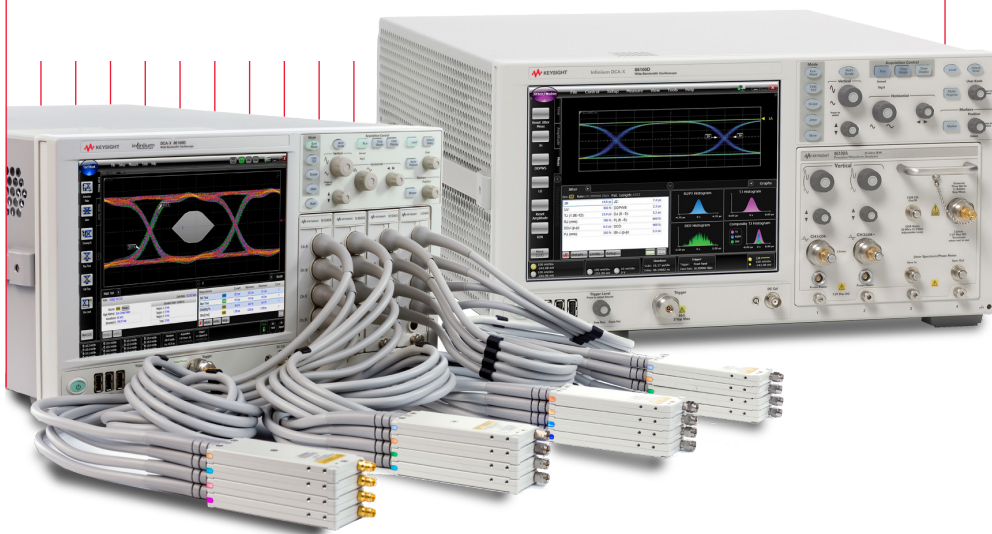


Keysight Technologies

DCA Probes & 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 |



Clock Recovery Phase Matching Cable Kits

N1027A-S32 kit

- 1x N1075-60013 9/125 um single-mode fiber, FC/PC, 5.3 m
- 2x N1075-60017 2.92 mm male-to-male coaxial cable, 1m¹

N1027A-M14

- 1x N1075-60015 9/125 um single-mode fiber, FC/PC 7.1 m
- 1x N1075-60016 62.5/125 um multimode fiber, FC/PC, 6.0 m
- 2x N1075-60017 2.92 mm male-to-male coaxial cable, 1m¹



1. 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 & Connector Savers

Description below specifies gender of adapter

| | |
|-------------|--|
| 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 |
| 11900B | 2.4 mm female to 2.4 mm female adapter/connector saver |
| 11900C | 2.4 mm female to 2.4 mm male connector saver |
| 11901A | 2.4 mm male to 3.5 mm male adapter |
| 11901B | 2.4 mm female to 3.5 mm female adapter |
| 11901C | 2.4 mm male to 3.5 mm female adapter |
| 11901D | 2.4 mm female to 3.5 mm male adapter |
| | |
| 85130-60010 | 2.4 mm female to 3.5 mm male NMD bulkhead adapter |
| 83059A | 3.5 mm male to 3.5 mm male adapter/connector saver |
| 83059B | 3.5 mm female to 3.5 mm female adapter/connector saver |
| 83059C | 3.5 mm female to 3.5 mm male connector saver |
| | |
| 5061-5311 | 3.5 mm female to 3.5 mm female adapter/connector saver |

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.



11900B



11901C



85130-60010
2.4 F - 3.5 M



5061-5311

DC Blocks, Phase Trimmers, Cables, Caps

| | |
|------------|---|
| N9398G | 1.85 mm male-to-female DC block 16V 700 kHz - 67 GHz |
| N9398F | 2.4 mm male-to-female DC block 16V 50 kHz- 50 GHz |
| N9398C | 3.5 mm male-to-female DC block 16V 50 kHz - 26.5 GHz |
| | |
| N1027A-PT2 | 2.4 mm male-to-female phase trimmer |
| N1027A-PT3 | 3.5 mm male-to-female phase trimmer |
| N1027A-1C1 | 1.85 mm coaxial male-to-male cable, 67 GHz, 10 cm |
| | |
| N4910A | 2.4 mm male-to-male matched coaxial cable pair, 61 cm |
| N4871A | 3.5 mm male-to-male matched coaxial cable pair, 91 cm |
| | |
| N1027A-1CF | Shipping cap to protect 1.85/2.4 mm female inputs |
| N1027A-1CM | Shipping cap to protect 1.85/2.4 mm male inputs |

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:

The N1045A-04F requires four N1027A-1CF caps.



N9398F



N4910A



N1027A-PT2

Attenuators, Terminations

| | |
|-----------|---------------------------|
| 8493C-003 | 3.5 mm 3 dB attenuator |
| 8493C-006 | 3.5 mm 6 dB attenuator |
| 8493C-010 | 3.5 mm 10 dB attenuator |
| 8493C-020 | 3.5 mm 20 dB attenuator |
| | |
| 8490D-003 | 2.4 mm 3 dB attenuator |
| 8490D-006 | 2.4 mm 6 dB attenuator |
| 8490D-010 | 2.4 mm 10 dB attenuator |
| 8490D-020 | 2.4 mm 20 dB attenuator |
| | |
| 909D-011 | 3.5 mm female 50 Ohm load |
| 909D-301 | 3.5 mm male 50 Ohm load |
| | |
| 85138A | 2.4 mm male 50 Ohm load |
| 85138B | 2.4 mm female 50 Ohm load |
| | |
| 85140A | 2.4 mm male short |
| 85140B | 2.4 mm female short |
| | |
| 85141A | 2.4 mm male open |
| 85141B | 2.4 mm female open |



8493C



8490D



909D-011



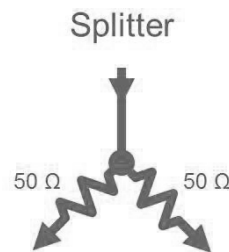
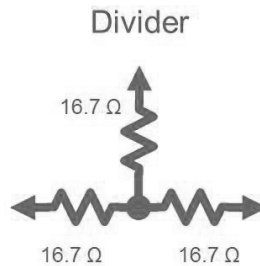
85138A



85140B

Power Dividers, Splitters

| | |
|--------|---------------------------------------|
| 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

- N1000-40008 Front cover for 86100D¹
- N1027A-1AC Accessory case²
- N1027A-1MC Module storage case for N1045A module
- N1027A-1CL Clip for N1045A cable management
- N1027A-2CL Clip for two N1045A remote heads
- 86101-60017 Module filler panel for 86100A/B/C/D (1/4 bay width)³
- 86101-60016 Module filler panel for 86100A/B/C/D (1/2 bay width)^{3, 4}

1. Does not fit 86100A/B/C mainframes.
2. Empty N1027A-45A case (see photo on page 2).
3. 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. While supplies last. Otherwise use two 86101-60017.



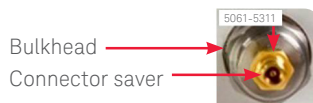
ESD Protection

- N9355CK01 3.5 mm DC coupled limiter
- 9300-1308 ESD heel strap
- 9300-1367 ESD wrist strap
- 9300-0980 ESD ground cord
- 9300-1484 ESD desk mat



Rackmount Kits, Tools

- 1CM030A Rackmount kit for 86100A/B/C
- 1CP018A Rackmount kit with handles for 86100A/B/C
- 1CM015A Rackmount kit for 86100D
- 1CP020A Rackmount kit with handles for 86100D
- 8710-1582 0.57 nm (5 lbs-in) torque wrench¹
- 8710-1765 0.9 nm (8 lbs-in) torque wrench²
- 8710-1764 0.9 nm (8 lbs-in) torque wrench³



1. 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 - 30 GHz Probing System Overview

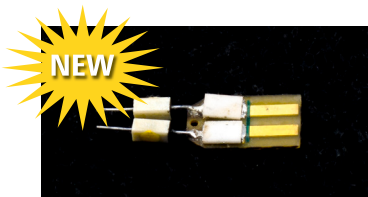
Probe amps

- 16 GHz - 30 GHz (Highest bandwidth in the market)
- Industry's highest fidelity and accuracy
- Bandwidth upgradable



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

Probe heads and accessories



N2838A
25 GHz PCB ZIF probe tips



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



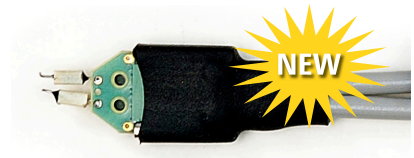
N5445A
30 GHz browser



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

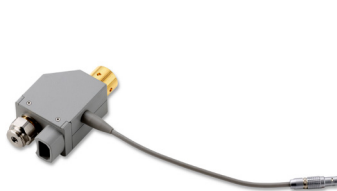


N5441A
16 GHz solder-in probe head



N2836A
26 GHz solder-in probe head

Probe adapters



N5477A
Sampling oscilloscope adapter



N5449A
Hi impedance probe adapter



N5442A
Precision BNC 50 ohm adapter



N5443A
Performance
verification & deskew
fixture

Using InfiniiMax III Probe with DCAs

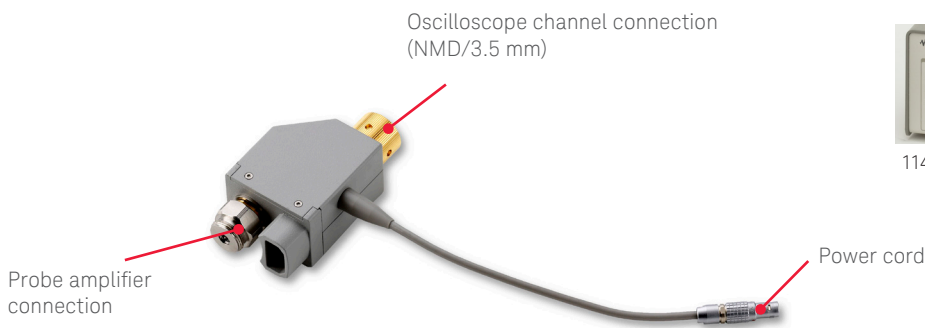
- For directly connecting to any DCA module with a 3.5 mm bulkhead connector: N5477A sampling oscilloscope adapter to InfiniiMax III probes.
- For directly connecting to any DCA module with a 2.4 mm bulkhead connector: N1022B plus 85130-60010 2.4 mm (f) to 3.5 mm (m) NMD adapter.
- For modules that do not have built-in probe power: add an 1143A probe power supply with Option 001.
- N5477A plus InfiniiMax III N2803A probe provide 30 GHz bandwidth.



85130-60010
2.4 F -3.5 M



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: add 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

| Model | Description | Quantity |
|-------------|-------------------------------|----------|
| 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 | 1 |

N1021B 18 GHz Differential TDR/TDT Probe Kit

| Qty. | 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 Ohm (m) | 1810-0118 |
| 2 | SMA adapter (f-f) | 1250-1666 |
| 1 | Adapter to positioners (includes two 2.5 mm screws and one Allen wrench) | N1021-60008 |
| 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)



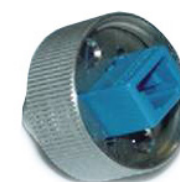
81000LI - LC



81000KI - SC



81000HI - E2000



81000MI - MU



81000SI - DIN4108/47256

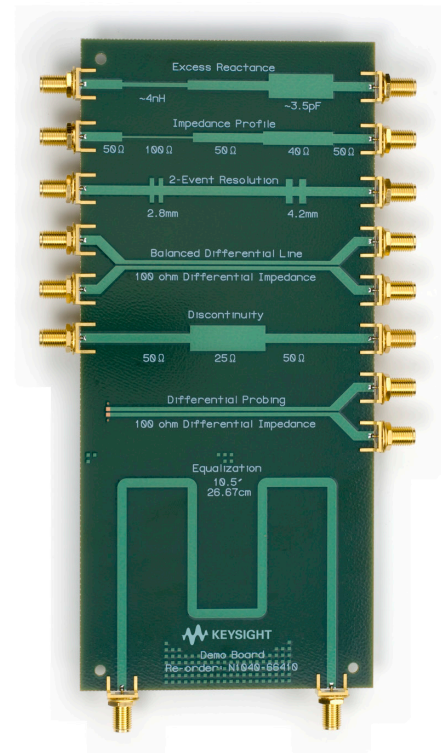


81000VI - ST

Training Tools and Devices

Available from www.keysight.com/find/parts

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



Appendix: DCA Input Connectors

| Product | Probe power | 3.5 mm | 2.4 mm | 1.85 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 | | | FC/PC nut | |
| 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 | | | f fixed | | |
| N1045A-xxF | No | | | f fixed | | |
| N1045A-xxM | No | | | m fixed | | |

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 on page 9)

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) for mode-free performance to 65 GHz. Hewlett Packard offered their 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

| | |
|--|-------------|
| <i>RF and Microwave Test Accessories Catalog</i> (www.keysight.com/find/mta) | 5990-8661EN |
| <i>86100D DCA-X Data Sheet</i> (www.keysight.com/find/dcax) | 5990-5824EN |
| <i>Using the Keysight N5477A Sampling Oscilloscope Adapter</i> | N5477-97000 |

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