# DCA Accessories

## N1027A Kits and General-Purpose Parts

Achieving the highest accuracy with a Digital Communication Analyzer (DCA) can be made easier with the right accessories. This document lists recommended items for 86100D/N1000A DCA-X mainframes, their modules, the N109XX DCA-Ms and the N107XX clock recoveries:

- Attenuators, DC blocks
- Calibration kits, loads, shorts, terminations
- Adapters and connector savers
- Phase matching cable kits, equalizers
- Power dividers/splitters, pickoffs
- Rack mount kits, storage and protection
- Torque wrenches and other tools

**Unless stated otherwise, all accessories are sold separately from the main products.**

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# Accessory Kits for Electrical Channels
## N1027A-45A Demo Kit for N1045A and N1046B Remote Head Modules

| Qty | Part Number | Description |
| --- | --- | --- |
| 1 | 8710-1582 | 7.9 mm (5/16 in) 0.57 Nm (5 lbs-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, 700 kHz to 67 GHz |
| 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-45A

## N1027A-46A Demo Kit for N1046A Remote Head Modules

| Qty | Part Number | Description |
|-----|-------------|-------------|
| 2 | 11901C | Adapter, 2.4 mm male to 3.5 mm female |
| 2 | 11920A | 1.0 mm male to 1.0 mm male adapter |
| 2 | 11921E | 1.0 mm male to 1.85 mm male adapter |
| 2 | 11921G | 1.0 mm male to 1.85 mm female adapter |
| 4 | 5022-6494 | Bracket, remote head probe |
| 1 | 8710-1582 | 7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench |
| 1 | 8710-2079 | 6 mm (15/64 in) 0.45 Nm (4 in-lbs) torque wrench |
| 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 |

## N1027A-AxF Accessory Kits Shipping with Every N1046A Module

| -A1F | -A2F | A4F | Part Number | Description |
|------|------|-----|-------------|-------------|
| 1 | 2 | 4 | 11921E | 1.0 (m) to 1.85 (m) adapter |
| 1 | 1 | 1 | 8710-2156 | 6 mm holding wrench |
| 1 | 1 | 1 | 710-1761 | 7 mm holding wrench |
| 1 | 1 | 1 | 8710-2079 | 6 mm 0.45 Nm (4 lbs-in) torque wrench |
| 1 | 1 | 1 | 8710-1582 | 7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench |
| 1 | 1 | 1 | N1027A-1CL | Clips for remote head cables (4 colors, qty 4 each) |
| - | 1 | 2 | N1027A-2CL | Clip for two N104XX remote heads |
| 1 | 1 | 1 | N1046-40002 | Accessory case for N1046A |



N1027A-A4F

## N1060-60005 Accessory Kit Shipping with Every N1060A Module

The N1060A module has 1.0 mm male ruggedized connectors. The N1060-60005 Accessory Kit provides ruggedized adapters (and required wrenches) to 1.85 mm and 2.92 mm female connector interfaces.

| Qty | Part Number | Description |
|---|---|---|
| 2 | Y1901B | Ruggedized 1.0 mm female to 1.85 mm female adapter |
| 2 | Y1903B | Ruggedized 1.0 mm female to 2.92 mm female adapter |
| 1 | 8710-1582 | 7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench |
| 1 | 8710-1761 | 7 mm holding wrench |
| 1 | 8710-1764 | 20 mm 0.9 Nm (8 lbs-in) torque wrench |
| 1 | 8710-2819 | 14 mm 0.45 Nm (4 lbs-in) and 1.13 Nm (10 lbs-in) special double torque wrench |
| 1 | N1060-20009 | 8 mm holding wrench |
| 1 | N1060-90001 | User Guide (how to torque adapters) |
| 1 | N1060-40001 | Accessory case |



*N1060A-60005*

# Accessory Kits for TDR/TDT Modules
## N1027A-34F/34M/54F/54M TDR/TDT Accessory Kits

The N1027A series accessory kits for N1055A modules provide ECal units, adapters and tools for the TDR/TDT remote heads. To be fully compatible the N1027A-xxx option of the accessory kit must match the N1055A-xxx option of the module (e.g., use a N1027A-54F for a N1055A-54F configuration[1]).

| Part Number | Description |
|---|---|
| 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*

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[1] The first character of the N1055A option code defines 35 or 50 GHz bandwidth, the second character the number of remote heads (2 or 4), and the third character the gender of the input connector on the remote head (male of female).

N1027A-xxx kits for the N1055A modules contain the following quantities:

| –34F | –34M | –54F | –54M | Part Number | Description |
|---|---|---|---|---|---|
| 1 | | 1 | | N4694D/0DC/M0M | 67 GHz 2-port 1.85 mm ECal module, DC coupled, 2 male connectors |
| | 1 | | 1 | N4694D/0DC/F0F | 67 GHz 2-port 1.85 mm ECal module, DC coupled, 2 female connectors |
| | 2 | 4 | | 11901C | 2.4 mm male to 3.5 mm female adapter |
| 2 | | | 4 | 11901D | 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 | 20 mm 0.9 Nm (8 lbs-in) torque wrench |
| 1 | 1 | 1 | 1 | 8710-1765 | 7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench |
| 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 | 1 | 1 | 1 | N1027A-xAC | Accessory case |
| | 1 | | | N1027A-xAC | Accessory case |

## ECal Modules

ECal modules are included in the N1027A-xxx TDR/TDT accessory kits (page 7). They can also be purchased standalone. Configurations depend on the connector size and gender of the device under test (DUT). Keysight recommends the following combinations:

| DUT Connector | ECal Module | TDR/TDT Module | Adapters |
|---|---|---|---|
| 1.85 or 2.4 mm Female | N4694D with #F0F and #0DC | N1055A with #52M or $54M | None |
| 1.85 or 2.4 mm Male | N4694D/ with #M0M and #0DC | N1055A with #52F or $54F | None |
| 2.92 mm Female | N4694D with #F0F and #0DC | N1055A with #52M or $54M | 11901C on ECal 11901D on remote head |
| | N4694D with #F0F and #0DC | N1055A with #32M or $34M | 11901C on ECal (2.4 mm male to 3.5 mm female) |
| 2.92 mm Male | N4694D/ with #M0M and #0DC | N1055A with #52F or $54F | 11901D on ECal 11901C on remote head |
| | N4694D/ with #M0M and #0DC | N1055A with #32F or $34F | 11901D on ECal (2.4 mm female to 3.5 mm male) |

| 3.5 mm or SMA Female | N4694D with #F0F and #0DC | N1055A with #32M or $34M | 11901C on ECal (2.4 mm male to 3.5 mm female) |
|---|---|---|---|
| 3.5 mm or SMA Male | N4694D/ with #M0M and #0DC | N1055A with #32F or $34F | 11901D on ECal (2.4 female mm to 3.5 mm male) |

- The N4694D with options M0M and 0DC is a 67 GHz 2-port DC coupled ECal module with male 1.85 mm connectors.

- The N4694D with options F0F and 0DC is a 67 GHz 2-port DC coupled ECal module with female 1.85 mm connectors.

- The N1055A option code stands for:
  - First character: 35 or 50 GHz bandwidth
  - Second character: 2 or 4 remote heads per module
  - Third character: male or female inputs

- For best accuracy the ECal module (or the ECal module plus adapters) should have the same connector size and gender as the DUT. This allows the reference plane to be placed at the DUT's connectors during calibration. FlexDCA knows the 11901C/D adapters and can take their group delays into account (FlexDCA can also measure other adapters and add them to its database).

*N1027A-45A*

## Mechanical Calibration Kits

| Part Number | Description |
|---|---|
| 85052B | Standard mechanical calibration kit, DC to 26.5 GHz, for 3.5 mm applications |
| 85052D | Economy mechanical calibration kit, DC to 26.5 GHz, for 3.5 mm applications |
| 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 |

All kits provide SOLT calibration except the N1024B which is limited to SLT.
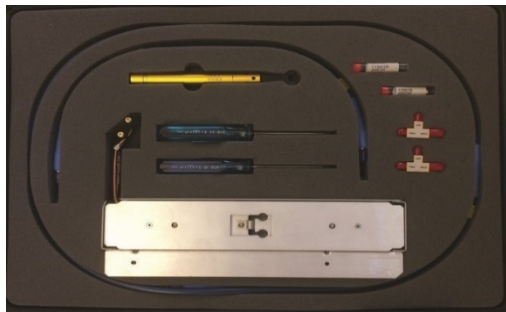
*N1027A-54F TDR/TDT Accessory Kit*

*85058E Economy mechanical calibration kit*

# Accessory Kits for Clock Recovery Instruments
## N1076A-CR1 (re-order: 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 (or recovering clocks from electrical signals with the N1077A). It is designed for the following DCA configuration: an 86100D DCA-X mainframe with option PTB, the N1076A external clock recovery module and the N1045A 60 GHz electrical module, N1046A 75/85/100 GHz electrical module and/or N1055A 50 GHz TDR module.

| Qty | 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 | 7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench |



*N1027A-76A Clock Recovery Accessory Kit*

## N1076B-CR1 (re-order: N1027A-76B)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate jitter measurements when using the N1076B external clock recovery (or recovering clocks from electrical signals with the N1078A). It is designed to be used with a N1000A DCA-X mainframe with an internal precision timebase plus any N1045A/N1046A/N1055A module.

| Qty | Part Number | Description |
|---|---|---|
| 1 | N1027A-2P8 | Microwave Pick-Off Tee 1.85 mm connectors, matched pair |
| 2 | N1027A-EQ6 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB |
| 2 | N1027A-EQ9 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB |
| 2 | N1027A-EQ3 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 3 dB |
| 1 | N1027-60015 | SMA delay line, 18.2 ns |
| 1 | N1076-60015 | Set of 2.92 mm delay lines, 2.37 ns matched pair plus 4.33 ns matched pair |
| 1 | 8710-1615 | T-20 Torx screwdriver |
| 1 | 8710-1623 | T-10 Torx screwdriver |
| 1 | 8710-1765 | 7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench |

## N1077A-CR1 (re-order: N1027A-77A)

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 a DCA-X mainframe with Option ETR/PTB installed (with any DCA plug-in module) or any N109x Series DCA-M product.

| Qty | 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 µm (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), 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 |

## N1078A-CR1 (re-order: N1027A-78A)

This kit provides specially matched cables that will minimize (align) clock-to-data delays and ensure accurate measurements when using the N1078A external clock recovery. It is designed to be used with a DCA-X mainframe with an internal precision timebase plus any optical DCA plug-in module, or with any N1092X Series DCA-M product.

| Qty | Part Number | Description |
| --- | --- | --- |
| 1 | N1027A-EQ6 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB |
| 1 | N1027A-EQ9 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB |
| 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), 0.3 m length |
| 1 | N1077-60008 | FC/PC optical cable, 9/125 µm (single-mode), 1.0 m length |
| 1 | N1077-60014 | FC/PC optical cable, 9/125 µm (single-mode), 5.0 m length |



*N1078A Clock Recovery triggering a N1092D DCA-M*

# RF/Microwave Parts

## Adapters[2]

Fits all 1.0 mm connectors (e.g., N1046A inputs):

| Part Number | Description |
| --- | --- |
| 11920A | 1.0 mm male to 1.0 mm male adapter |
| 11920B | 1.0 mm female to 1.0 mm female adapter |
| 11920C | 1.0 mm male to 1.0 mm female connector saver |
| 11921E | 1.0 mm male to 1.85 mm male adapter |
| 11921G | 1.0 mm male to 1.85 mm female adapter |



*11920B*

Recommended for ruggedized 1.0 mm connectors (e.g., N1060A inputs):

| Part Number | Description |
| --- | --- |
| Y1900B | Ruggedized 1.0 mm female to 1.0 mm female adapter |
| Y1901B | Ruggedized 1.0 mm female to 1.85 mm female adapter |
| Y1903B | Ruggedized 1.0 mm female to 2.92 mm female adapter |



*Y1900B*



*Y1903B*

Fits all 1.85 mm and 2.4 mm connectors (e.g., N1045A/B, N1055A inputs):

| Part Number | Description |
| --- | --- |
| N5520A | 1.85 mm male to 1.85 mm male adapter |
| N5520B | 1.85 mm female to 1.85 mm female adapter |
| N5520C | 1.85 mm female to 1.85 mm male connector saver |
| 11900A | 2.4 mm male to 2.4 mm male adapter |
| 11900B | 2.4 mm female to 2.4 mm female adapter |
| 11900C | 2.4 mm female to 2.4 mm male connector saver |
| 11904A | 2.4 mm male to 2.92 mm male adapter |
| 11904B | 2.4 mm female to 2.92 female adapter |
| 11904C | 2.4 mm male to 2.92 mm female adapter |
| 11904D | 2.4 mm female to 2.92 mm male adapter |
| 11901A | 2.4 mm male to 3.5 mm male adapter |
| 11901B | 2.4 mm female to 3.5 female adapter |
| 11901C | 2.4 mm male to 3.5 mm female adapter |
| 11901D | 2.4 mm female to 3.5 mm male adapter |
| 11903A | 2.4 mm male to type-N male adapter |
| 11903B | 2.4 mm female to type-N female adapter |
| 11903C | 2.4 mm male to type-N female adapter |
| 11903D | 2.4 mm female to type-N male adapter |



*11900B*



*11901C*

[2] Descriptions specify gender of adapter. A male input connector on an instrument requires a female-to-female adapter for connecting a cable with male connectors.

Recommended for bulkhead inputs:

| Part Number | Description |
|---|---|
| 5061-5311 | 3.5 mm female to female connector saver (e.g., 86100A/B/C frames, 8610XX, 8611XX modules) |
| 1250-4105 | 2.92 mm female to female connector saver (e.g., 86100D, N1000A) |
| 11900B | 2.4 mm female to female adapter (e.g., 86108B with #HBW, N1094A/B) |
| Y1903B | Ruggedized 1.0 mm female to 2.92 mm female adapter (e.g., N1060A) |
| Y1901B | Ruggedized 1.0 mm female to 1.85 mm female adapter (e.g., N1060A) |
| Y1900B | Ruggedized 1.0 mm female to 1.0 mm female adapter (e.g., N1060A) |

*5061-5311*

*1250-4105*

*Y1901B*

NMD bulkhead adapters:

| Part Number | Description |
|---|---|
| 85130-60010 | 3.5 mm male to 2.4 mm female adapter |
| 83059A | 3.5 mm male to 3.5 mm male adapter |
| 83059B | 3.5 mm female to 3.5 mm female adapter |
| 83059C | 3.5 mm female to 3.5 mm male connector saver |
| 5062-1247 | 3.5 mm male bulkhead to female 3.5 mm adapter |

## Attenuators

| Part Number | Description |
|---|---|
| 8490G-003 | 1.85 mm 3 dB attenuator |
| 8490G-006 | 1.85 mm 6 dB attenuator |
| 8490G-010 | 1.85 mm 10 dB attenuator |
| 8490G-020 | 1.85 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 |
| 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 |

*11500J*

*N4910A*

## Cables

| Part Number | Description |
| --- | --- |
| 11500J | 1.0 mm female-to-male cable, 16 cm, DC-110 GHz |
| N1027A-1C1 | 1.85 mm cable, male-to-male, 67 GHz, 10 cm |
| N1027A-3C1 | 2.92 mm cable, male-to-male, 2.37 ns delay, 55 cm |
| N1027A-3C2 | 2.92 mm, cable, male-to-male, 4.33 ns delay, 1.0 m |
| N1027A-3C3 | SMA cable, male-to-male, Data Out/Data In for N1076A/B |
| N4910A | 2.4 mm matched cable pair, 61 cm |
|  |  |

## Caps for Input Protection

| Part Number | Description |
| --- | --- |
| 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 |
| N1027A-3CF | Shipping cap to protect 2.92/3.5 mm female inputs |
| N1027A-3CM | Shipping cap to protect 2.92/3.5 mm male inputs |

*N1027A-1CF/1CM*

## DC Blocks

| Part Number | Description |
| --- | --- |
| N9398G | 1.85 mm male-to-female DC block 16 V 700 kHz to 67 GH |
| N9398F | 2.4 mm male-to-female DC block 16 V 50 kHz to 50 GH |
| N9398C | 3.5 mm male-to-female DC block 16 V 50 kHz to 26.5 GH |

*N9398F*

## Equalizers

| Part Number | Description |
| --- | --- |
| N1027A-EF6 | Equalizer, 6 dB, 2.92 mm (m/f), up to 56 GBd |
| N1027A-EQ3 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 3 dB |
| N1027A-EQ6 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 6 dB |
| N1027A-EQ9 | Equalizer, 2.92 mm (m) to 2.92 mm (f), 9 dB |

## Phase Trimmers

| Part Number | Description |
|---|---|
| N1027A-PT2 | 2.4 mm male-to-female phase trimmer, range > 22 ps, IL ≤ 0.8 dB at 50 GHz |
| N1027A-PT3 | SMA female-to-female phase trimmer, range > 53 ps, IL ≤ 0.8 dB at 26 GHz |

*N1027A-PT3*

## Pick-Offs

| Part Number | Description |
|---|---|
| N1027A-2P1 | Microwave Pick-Off Tee 1.0 mm connectors, matched pair |
| N1027A-2P8 | Microwave Pick-Off Tee 1.85 mm connectors, matched pair |
| N1027A-2P2 | Microwave Pick-Off Tee 2.4 mm connectors, matched pair |
| N1027A-2P3 | Microwave Pick-Off Tee 2.92 mm connectors, matched pair |

The N1027A pick-off tees are designed to work with the electrical inputs on the N1076A/B, N1077A and N1078A clock recovery instruments.
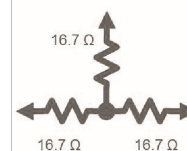
*N1027A-2P8*

## Power Dividers/Splitters

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

*11636B*

## Terminations

| Part Number | Description |
|---|---|
| 85138B | 2.4 mm female 50 Ω load |
| 85141B | 2.4 mm female open |
| 85140B | 2.4 mm female short |
| 85138A | 2.4 mm male 50 Ω load |
| 85141A | 2.4 mm male open |
| 85140A | 2.4 mm male short |
| 909D-011 | 3.5 mm female 50 Ω load |
| 909D-305 | 3.5 mm male 50 Ω load |
| 0960-0055 | 3.5 mm male short |

*11667C*

# Mechanical Accessories
## Filler Panels

| Part Number | Description |
|---|---|
| 86101-60017 | 86100D Module filler panel (1/4 bay width, quartz gray) |
| N1027A-AFP | N1000A Module filler panel (1/4 bay width, carbon black) |

All 86100D and N1000A DCA-X mainframes ship with two filler panels to cover two slots. All mini-modules (i.e., modules that are ¼ bay wide) ship with one filler panel.



*N1027A-RM1*

## Rack Mount Kits

| Part Number | Description |
|---|---|
| 1CM015A | Rackmount kit for 86100D/N1000A |
| 1CM030A | Rackmount kit for 86100A/B/C |
| 1CP018A | Rackmount kit with handles for 86100A/B/C |
| 1CP020A | Rackmount kit with handles for 86100D/N1000A |
| N1027A-RM1 | Single DCA-M rack mount kit |
| N1027A-RM2 | Dual DCA-M side by side rack mount |



*N1027A-RM2*

## Remote Head Accessories Clips

| Part Number | Description |
|---|---|
| N1027A-1CL | Clips for remote head cables (4 colors, qty 4 each) |
| N1027A-2CL | Clip for two N1045A/B, N1046A or N1055A remote heads |



*N1027A-1CL*

## Storage

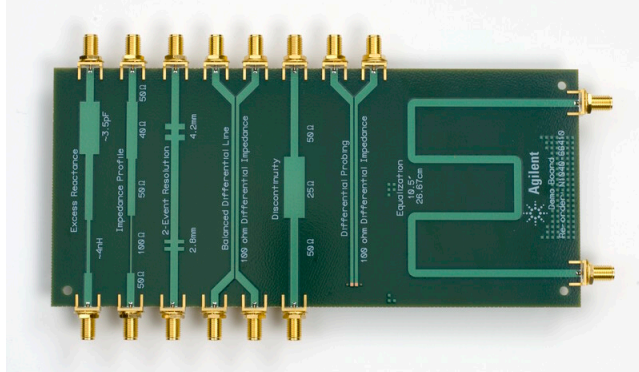| Part Number | Description |
|---|---|
| N1000-40002 | Front cover for DCA-X (ships with 86100D, also fits N1000A) |
| N1000-40011 | Front cover for DCA-X (ships with N1000A, also fits 86100D) |
| N1090-00002 | Front cover for DCA-M (ships with N1076A/77A, N1092X/94X) |
| N1090-00015 | Front cover for DCA-M (ships with N1076B/78A, fits N109XX) |
| N1027A-1AC | Empty N1027A-45A case |
| 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/B, N1046A module |
| N1027A-3MC | Module storage case for N1055A module |



*N1027A-2CL*



*N1027A-1MC*

## Tools

| Part Number | Description |
|---|---|
| 8710-2156 | 6 mm holding wrench (to hold 1.0 mm adapters and interfaces while torqueing a connector to them) |
| 8710-1761 | 7 mm holding wrench (to hold 2.92/3.5/SMA adapters and interfaces while torqueing a connector to them.) |
| 8710-1582 | 7.9 mm (5/16 in) 0.57 Nm (5 lbs-in) torque wrench (recommended for 1.85/2.4 mm DCA connectors) |
| 8710-1765 | 7.9 mm (5/16 in) 0.9 Nm (8 lbs-in) torque wrench (recommended for 3.5 mm DCA connectors)) |
| N1060-20009 | 8 mm holding wrench (recommended for N1060A) |
| 8710-2819 | 14 mm 0.45 Nm (4 lbs-in) and 1.13 Nm (10 lbs-in) special double torque wrench (recommended for N1060A) |
| 8710-1764 | 20 mm 0.9 Nm (8 lbs-in) torque wrench (recommended for DCA bulkheads) |
| 8710-1615 | T-20 Torx screwdriver |
| 8710-1623 | T-10 Torx screwdriver |

# Other Accessories

## Demo and Training Devices

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



*N1040-66410*

## ESD Protection

| Part Number | Description |
|---|---|
| N9355CK01 | 3.5 mm DC coupled limiter (limits signals to ±0.6 $V_{peak}$) |
| 9300-1308 | ESD heel strap |
| 9300-1367 | ESD wrist strap |
| 9300-0980 | ESD ground cord |
| 9300-1484 | ESD desk mat |



*N9355CK01*



*ESD heel strap, wrist strap and ground cord on desk mat*

## USB Devices

| Part Number | Description |
|---|---|
| E8900-D10 | USB read-only licensing dongle - FLEX10 |

The non-writeable, no-memory dongle provides a unique host ID for Keysight licenses.

# Appendix

## DCA Input Connectors

| Product | 3.5 mm | 2.92 mm | 2.4 mm | 1.85 mm | 1.0 mm | Optical | Comment |
|---|---|---|---|---|---|---|---|
| 54754A | f/f CS | | | | | | |
| 83496B | f/f CS | | | | | | |
| 86100D | | f/f CS | | | | | |
| 86105C | f/f CS | | | | | FC/PC nut | |
| 86105D-141 | f/f CS | | | | | FC/PC nut | |
| 86105D-281 | | | f/f CS | | | FC/PC nut | |
| 86107A | f/f CS | | f/f CS | | | | 2.4 mm on 40 GHz input |
| 86108A | f/f CS | | | | | | |
| 86108B | f/f CS | | f/f CS | | | | 2.4 mm on 50 GHz inputs |
| 86112A | f/f CS | | | | | | |
| 86115D | | | | | | FC/PC nut | |
| 86116C | | | | m fixed | | FC/PC nut | |
| 86117A | | | f/f CS | | | | |
| 86118A | | | | f fixed | | | |
| N1000A | | f/f CS | | | | | |
| N1045A/B-xxF | | | | f fixed | | | |
| N1045A/B-xxM | | | | m fixed | | | |
| N1046A | | | | | f fixed | | Includes 1.0 mm male to 1.85 female adapters |
| N1055A-3xF | f fixed | | | | | | |
| N1055A-3xM | m fixed | | | | | | |
| N1055A-5xF | | | | f fixed | | | |
| N1055A-5xM | | | | m fixed | | | |
| N1060A | | | | | m rug | | Includes adapters (see N1060-60005 kit) |
| N1076A/76B | | f fixed | | | | | |
| N1077A/78A | | f fixed | | | | FC/PC | |
| N1090A | | | f SMA | | | FC/PC | |
| N1092A/B/D | | | | | | FC/PC | |
| N1092C/E | | | f/f CS | | | FC/PC | |
| N1094A/B | | | f/f CS | | | | Option 030 includes 2.4 to 2.92 mm adapters |

| | |
|---|---|
| f SMA | Female SMA input (fixed) |
| f/f CS | Female/female connector saver (bulkhead is male, connector saver is removable) |
| m/m CS | Male/male connector saver (bulkhead is female, connector saver is removable) |
| f fixed | Female fixed interface |
| m fixed | Male fixed interface |
| f rug | Female fixed ruggedized interface |
| m rug | Mmale fixed ruggedized interface |
| FC/PC | Straight FC/PC bulkhead, cleanable |
| FC/PC nut | Straight FC/PC based on 81000FI interface (see page 21) |
| DCA-M clock | Use 2.92 or 3.5 mm cables to provide clocks to the N109XX series of DCA-Ms |

## Optical Interfaces

Many DCA modules ship with 86100FI straight FC/PC interface pre-installed (see "FC/PC Nut" in table DCA Input Connectors on page 20). These interfaces can be removed and replaced with 81000xI interfaces shown here. The internal fiber tip is in a mini-HMS-10 ferrule that requires patchcords with straight physical contact connectors (e.g., DIN, E2000, FC/PC, LC, MU, SC, or ST connector).

The 81000xI interfaces are not used on N107XX Clock Recovery and N109XX DCA-M instruments.

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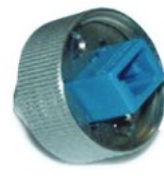
81000LI – LC

81000KI – SC

81000HI – E2000

81000MI – MU

81000SI – DIN4108/47256

81000VI – ST

## RF/Microwave Connectors

### NMD connector

The NMD connector is a ruggedized test-port connector. Most often, the connectors used are 3.5mm and 2.4mm male connectors. These connectors include a large threaded body that is specially designed to stabilize the test port cable when attached to the front of the analyzer or test set. The design of these connectors allows the use of standard female 3.5mm and 2.4mm cables and adapters. Since the test port connectors are male connectors, they have standard inside threads that can accommodate these female connectors. NMD stands for Network Measurements Division, an outdated term for the original HP division that produced the 8510A and 8720A analyzers.

### 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.

2.92 mm and 3.5 mm connectors use the same center pin. Inserting the larger SMA (m) center pin into a 2.92 mm or 3.5 mm connector can slightly degrade the connector. It is recommended that you only mate SMA (m) connectors to other connectors that you reserve for this purpose.

### 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 only 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.

To aid identification, 1.85 mm Keysight connectors have a groove in the male nut and female shoulder. The outer thread size of 1.85 mm and 2.4 connectors is larger than the tread size on SMA, 2.92 mm, and 3.5 mm connectors. This makes the area of the outer conductor's mating surface appear very large compared to the relatively smaller air dielectric.

## 1.0 mm connector

The 1.0 mm connector has been designed for ultra-high frequency signals (up to 110 GHz). Because of its small size it is **most at risk of being damaged** when making a connection. **Strictly follow the instructions** outlined in the N1060A Accessories Kit User Guide (literature # N1060-90001).

## Connector Summary

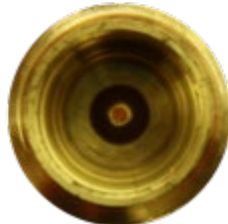| Type | Frequency Range | Recommended Torque | Compatible Connectors |
|------|-----------------|--------------------|-----------------------|
| 1.0 mm | ≤110 GHz | 0.45 Nm (4 lbs-in) | |
| 1.85 mm | ≤70 GHz | 0.57 Nm (5 lbs-in) | 2.4 mm |
| 2.4 mm | ≤50 GHz | 0.9 Nm (8 lbs-in) | 1.85 mm |
| 2.92 mm | ≤40 GHz | 0.9 Nm (8 lbs-in) | 3.5 mm and SMA |
| 3.5 mm | ≤34 GHz | 0.9 Nm (8 lbs-in) | 2.92 mm and SMA |
| SMA | ≤24 GHz | 0.9 Nm (8 lbs-in) | 2.92 mm and 3.5 mm |



| SMA | 3.5 mm | 2.92 mm |
|-----|--------|---------|

| 2.4 mm | 1.85 mm | 1.0 mm |
|--------|---------|--------|

*Typical female input connectors*

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## Literature References

*Generic literature link: literature.cdn.keysight.com/litweb/pdf/<literature number>.pdf*

| Document | Literature # |
|---|---|
| DCA Family Brochure (Solutions overview) | 5992-3301EN |
| FlexDCA Technical Overview | 5992-3319EN |
| | |
| 86100D DCA-X Mainframe and Modules Technical Specifications | 5990-5824EN |
| N1000A DCA-X Mainframe and Modules Technical Specifications | 5992-3271EN |
| N109XX DCA-M Technical Specifications | 5992-1454EN |
| N107XX Clock Recovery Technical Specifications | 5992-1620EN |
| | |
| N10xxx Series DCA Configuration Guide | 5992-3372EN |
| 861xxx Series DCA Configuration Guide | 5992-0038EN |
| DCA Accessories | 5991-2340EN |

## Web Resources

Generic: www.keysight.com/find/<product number> for any product number mentioned here

| | |
|---|---|
| DCA-X Mainframe: | www.keysight.com/find/dcax |
| DCA-M standalone: | www.keysight.com/find/dcam |
| FlexDCA (main page) | www.keysight.com/find/flexdca_pro |
| FlexDCA (download page) | www.leysight.com/find/flexdca_download |
| Clock recovery: | www.keysight.com/find/cdr |
| Microwave Accessories: | www.keysight.com/find/mta |

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