SIGNAL
MICROWAVE

Connector Products September 2023

Technology Partner
Richardson Electronics
POWER & MICROWAVE TECHNOLOGIES

800.348.5580
630.208.2200

rellpower.com
rellpower@rell.com

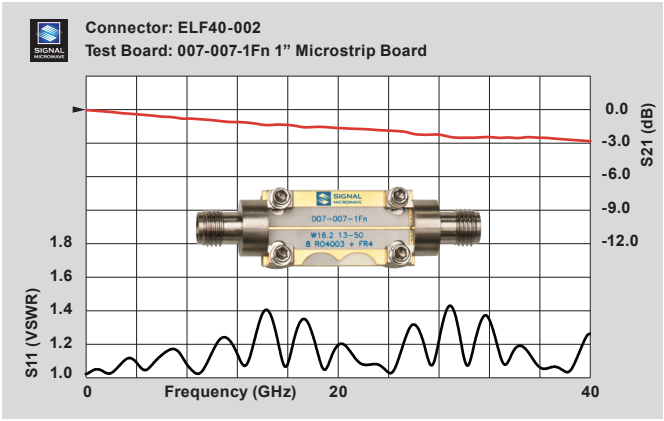
Signal Microwave

ELF40 2.92 mm (40 GHz) Edge Launch Connectors

Common Interface
ELF40

Narrow Profile
ELF40-001

Standard Profile
ELF40-002



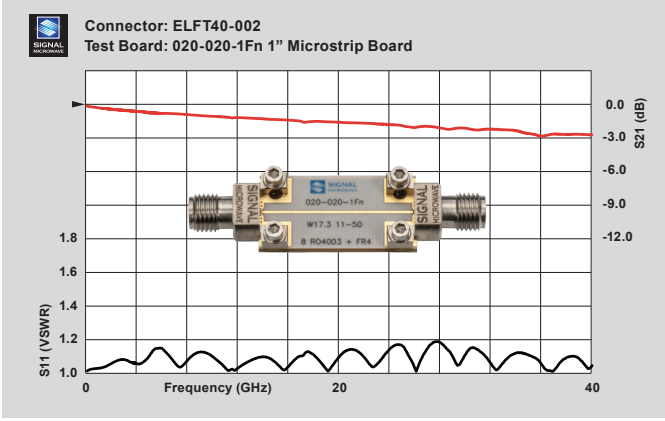
1" microstrip test board with typical data through 40 GHz

Edge Launch Drop-in Replacement Connectors

ELFT40 2.92 mm (40 GHz)

Common Interface
ELFT40

Standard Profile
ELFT40-002



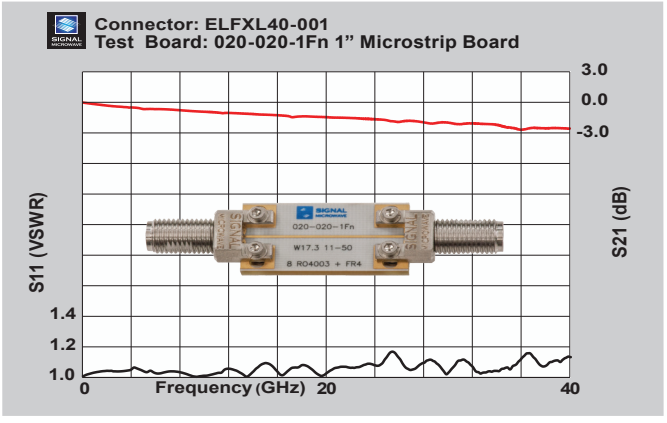
1" microstrip test board with typical data through 40 GHz

Extended Length Edge Launch Connectors For the Mount Panel Applications

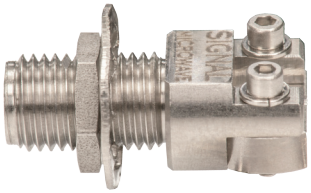
ELFXL40 2.92 mm (40 GHz)

Common Interface
ELFXL40

Narrow Profile
ELFXL40-001



1" microstrip test board with typical data through 40 GHz



Signal Microwave

Edge Launch Key Features:

- No Soldering Required
- Top Ground Only
- Board Design Support Available
- Test Boards Available

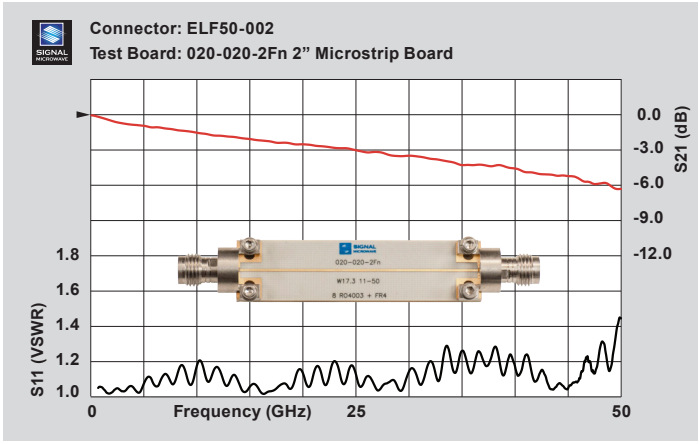
Edge Launch Connectors

ELF50 2.40 mm (50 GHz) Edge Launch Connectors

Common Interface
ELF50

Narrow Profile
ELF50-001

Standard Profile
ELF50-002



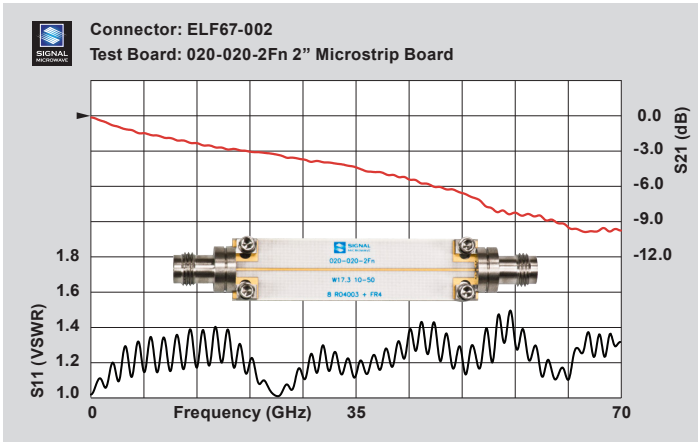
2" microstrip test board with typical data through 50 GHz

ELF67 1.85 mm (67 GHz) Edge Launch Connectors

Common Interface
ELF67

Narrow Profile
ELF67-001

Standard Profile
ELF67-002



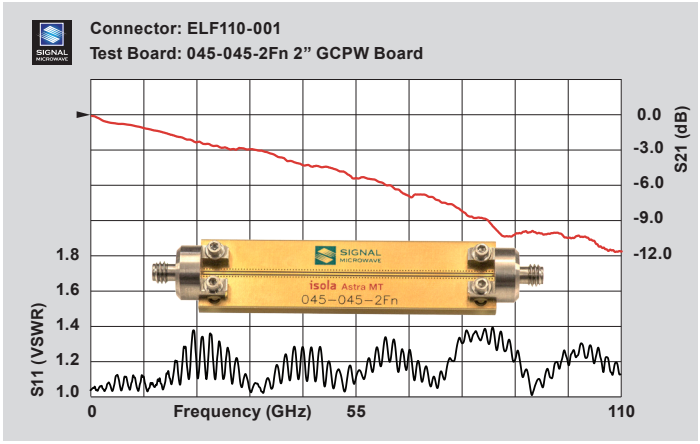
2" microstrip test board with typical data through 70 GHz

ELF110 1.0 mm (110 GHz) Edge Launch Connectors

Common Interface
ELF110

Narrow Profile
ELF110-001

Standard Profile
ELF110-002



2" GCPW test board with typical data through 110 GHz

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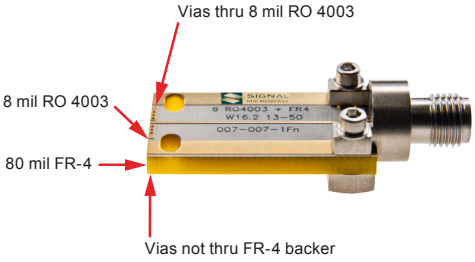
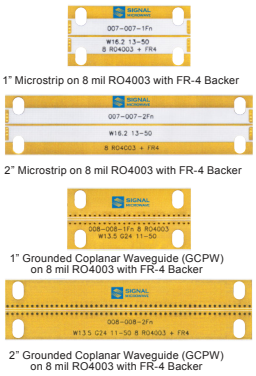
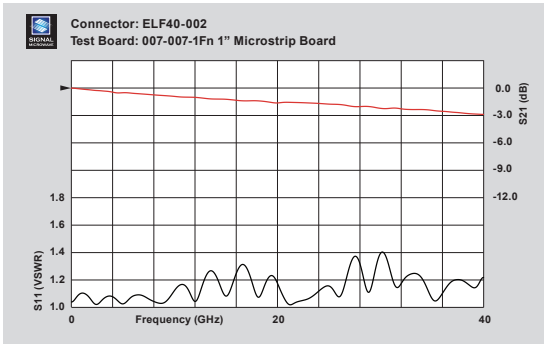
Test Boards for Edge Launch Connectors
(40 GHz)

- All test board launch designs are available at no charge in .pdf and .dxf formats
- 1" and 2" length microstrip and grounded coplanar waveguide (GCPW) boards available
- Available in both 40 GHz, 70 GHz and 110 GHz versions





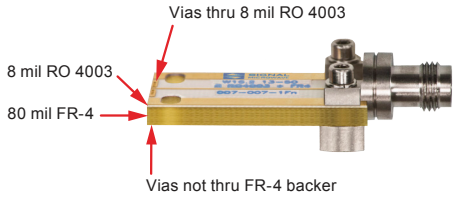


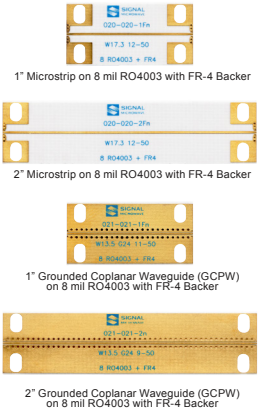
40 GHz Test Board Part Numbers:

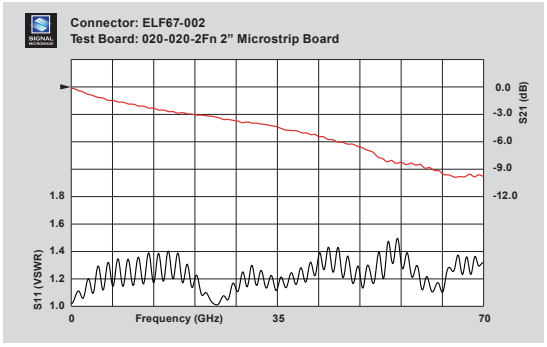
007-007-1Fn	1" Microstrip
007-007-2Fn	2" Microstrip
008-008-1Fn	1" Grounded Coplanar Waveguide (GCPW)
008-008-2Fn	2" Grounded Coplanar Waveguide (GCPW)

Typical test Data is shown in the Edge Launch Connector section. Demo boards are also available with sample connectors and test data.

Test Boards for Edge Launch Connectors
(70 GHz)



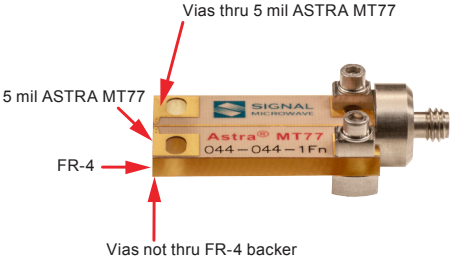


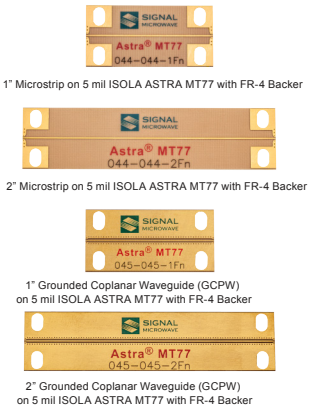


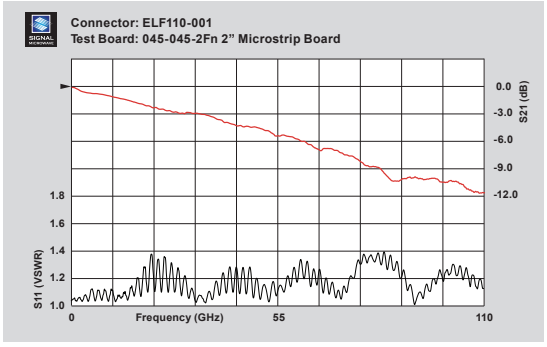
70 GHz Test Board Part Numbers:

020-020-1Fn	1" Microstrip
020-020-2Fn	2" Microstrip
021-021-1Fn	1" Grounded Coplanar Waveguide (GCPW)
021-021-2Fn	2" Grounded Coplanar Waveguide (GCPW)

Test Boards for Edge Launch Connectors
(110 GHz)







110 GHz Test Board Part Numbers:

044-044-1Fn	1" Microstrip
044-044-2Fn	2" Microstrip
045-045-1Fn	1" Grounded Coplanar Waveguide (GCPW)
045-045-2Fn	2" Grounded Coplanar Waveguide (GCPW)

All test board designs are available to customers at no charge in .pdf and .dxf formats. Demo boards are also available with sample connectors and test data.

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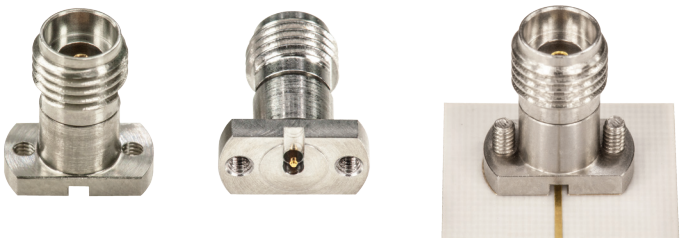
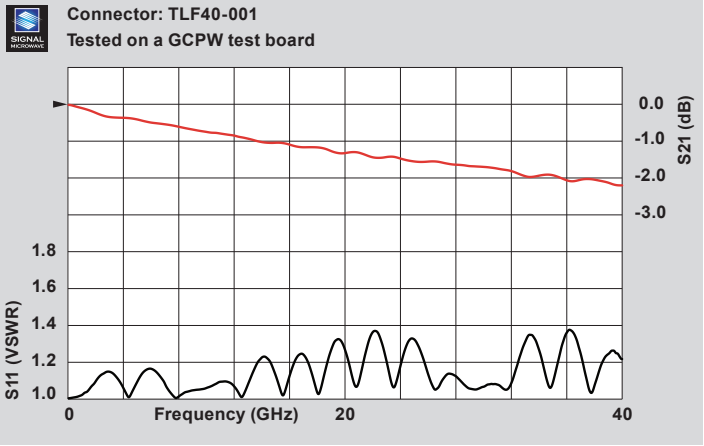
Top Launch Connectors

TLF40 2.92 mm (40 GHz)



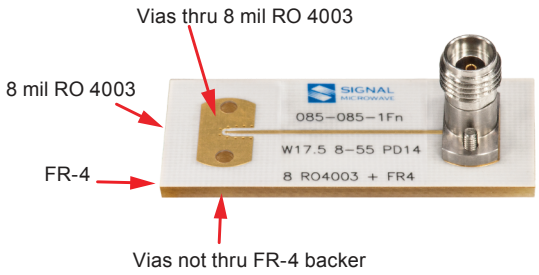


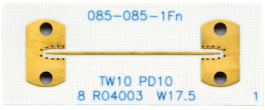
1" microstrip test board with typical data through 40 GHz

- Edge Launch Type Performance Anywhere on the Board
- 2.92 mm Connector for high speed digital industry with superior electrical performance
- Compression fit, screw-on mounting, does not require soldering

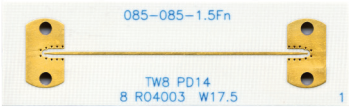
Test Boards for Top Launch Connectors

(40 GHz)

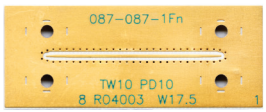




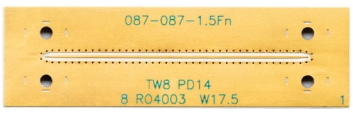
1" Microstrip on 8 mil RO4003 with FR-4 Backer



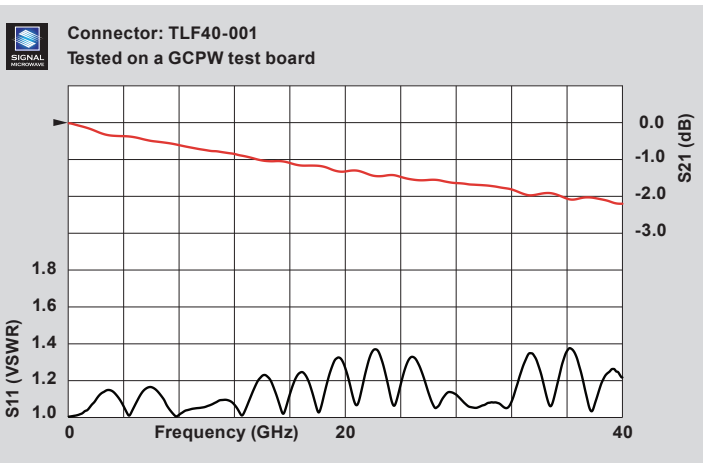
1.5" Microstrip on 8 mil RO4003 with FR-4 Backer



1" Grounded Coplanar Waveguide (GCPW) on 8 mil RO4003 with FR-4 Backer



1.5" Grounded Coplanar Waveguide (GCPW) on 8 mil RO4003 with FR-4 Backer



40 GHz Test Board Part Numbers:

085-085-1Fn	1" Microstrip
085-085-1.5Fn	1 ½" Microstrip
087-087-1Fn	1" Grounded Coplanar Waveguide (GCPW)
087-087-1.5Fn	1 ½" Grounded Coplanar Waveguide (GCPW)

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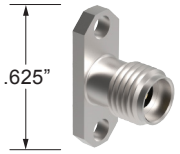
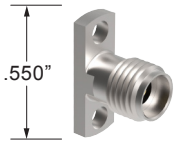
Field Replaceable Connectors

FRF40 2.92 mm (40 GHz)

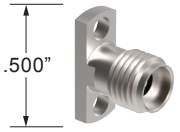
- 2.92 mm Interface
- Standard 2 & 4 Hole Flanges
- 40 GHz Bandwidth
- Rear Socket for 12 mil pin
- Low VSWR:
  DC – 27.0 GHz.....1.10:1
  27.0 – 40.0 GHz....1.15:1
- Temp Range -55º to +105º



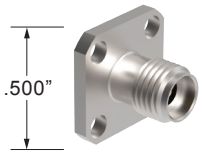
FRF40-001



FRF40-002

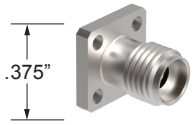


FRF40-003

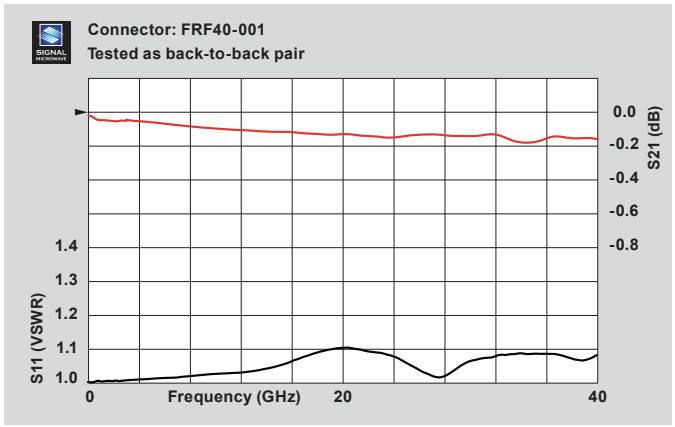


FRF40-004

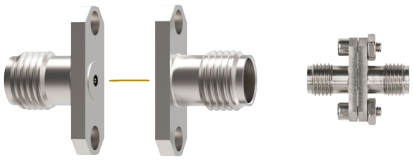
FRF40-001



FRF40-005



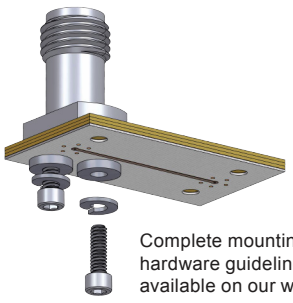
Typical test data through 40 GHz using FRF40-001 back-to-back connector pair with test pin.



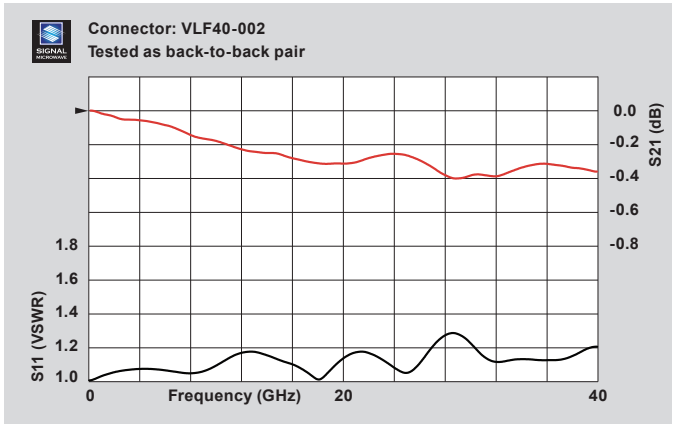
Vertical Launch Connectors

VLF40 2.92 mm (40 GHz)

VLF40-002



Complete mounting hardware guidelines available on our website



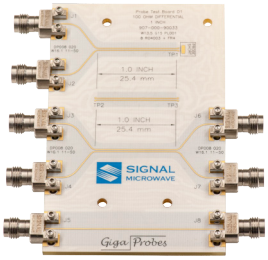
Typical data for 2 connectors tested as a back-to-back pair

- 2.92 mm Connector for high speed digital industry with superior electrical performance
- Compression fit, screw-on mounting, does not require soldering

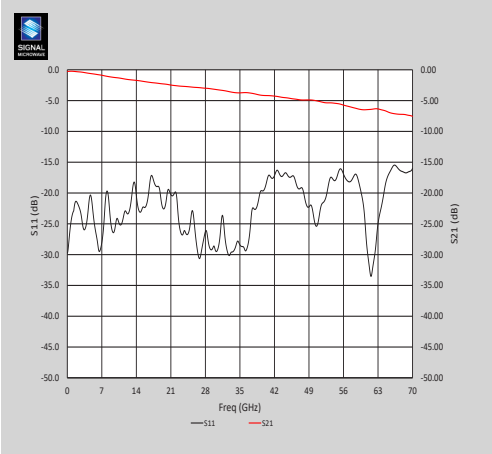
Signal Microwave

FPP Probe Series

- 100 ohm true odd mode differential
- 2 probe pins only – no ground pins
- Multiple bandwidths
  - 40 GHz bandwidth with 2.92 mm connectors
  - 50 GHz bandwidth with 2.4 mm connectors
  - 70 GHz bandwidth with 1.85 mm connectors
- Multiple probe pin pitches
  - 1.0 mm pin pitch
  - 0.8 mm pin pitch
  - 0.6 mm pin pitch
- Multiple mounting configurations
  - Standard 3 hole
  - Straight 1 hole
  - Custom mounting configurations available
- 1 year warranty



Probe 70 GHz s-parameters

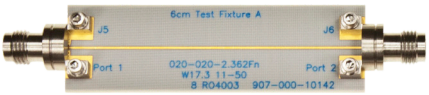


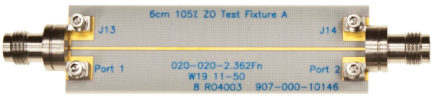
Patent 10852322
Patent 11175311
Patent 11543434
Other Patents Pending

Plug and Play De-embedding Kit in Support of IEEE-P370

Our library of innovative designs led to this kit which includes 70 GHz test boards, 2.92 mm or 1.85 mm connectors, and a flush short, all using our own designed and manufactured boards and connectors.

Five Board Types





1 **6 cm DUT Microstrip**
The de-embedded kit takes a known DUT which can be directly measured and the results saved. The data for the DUT is established at NIST traceable reference planes and therefore is repeatable.

2 **6 cm Test Fixture**
A set of 2 test fixtures with good performance can be measured and de-embedding files created. The de-embedding algorithm is applied and the resultant DUT data can be compared to the directly measured DUT data.

3 **6 cm 105% ZØ Test Fixture**
A degraded set of fixtures with 105% impedance is also included to challenge the de-embedding algorithm.

4 **2 Vias Test Fixture**
A third set of fixtures with the microstrip line starting on top of the board then transitioning to the bottom of the board and back on top again is included. These will further challenge the de-embedding algorithm.

5 **Beatty Standard DUT**
A “Beatty” standard line of 50 ohm /25 ohm /50 ohm impedance is also available as a DUT and can be used to verify TDR measurement de-embedding.

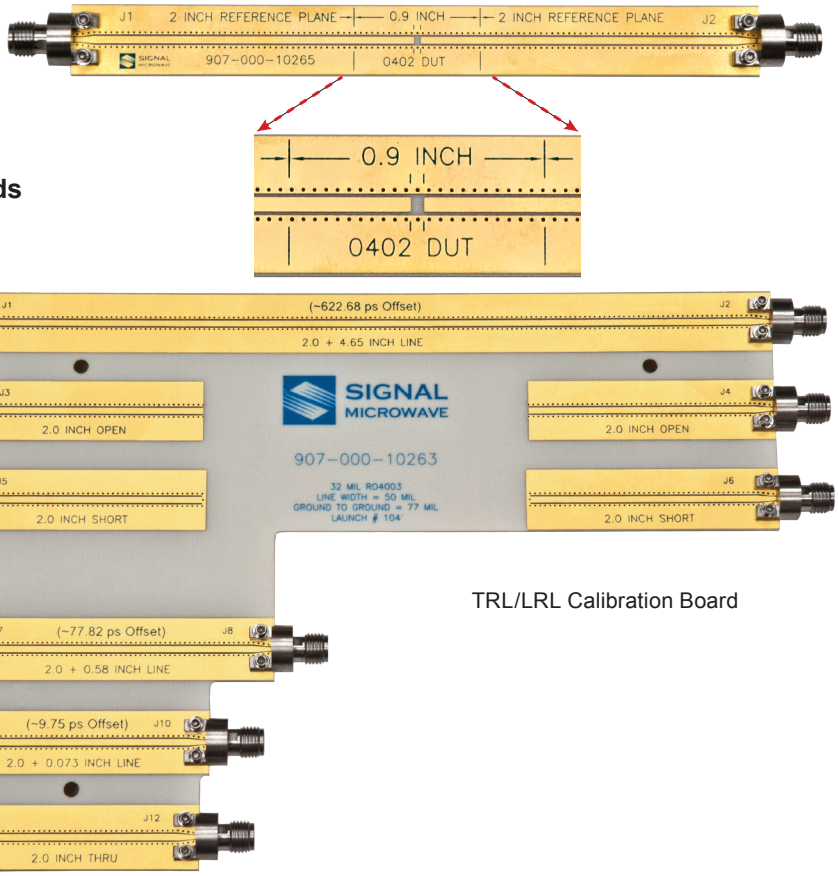
Signal Microwave

Calibration Boards

Turnkey 0402 Package Test System

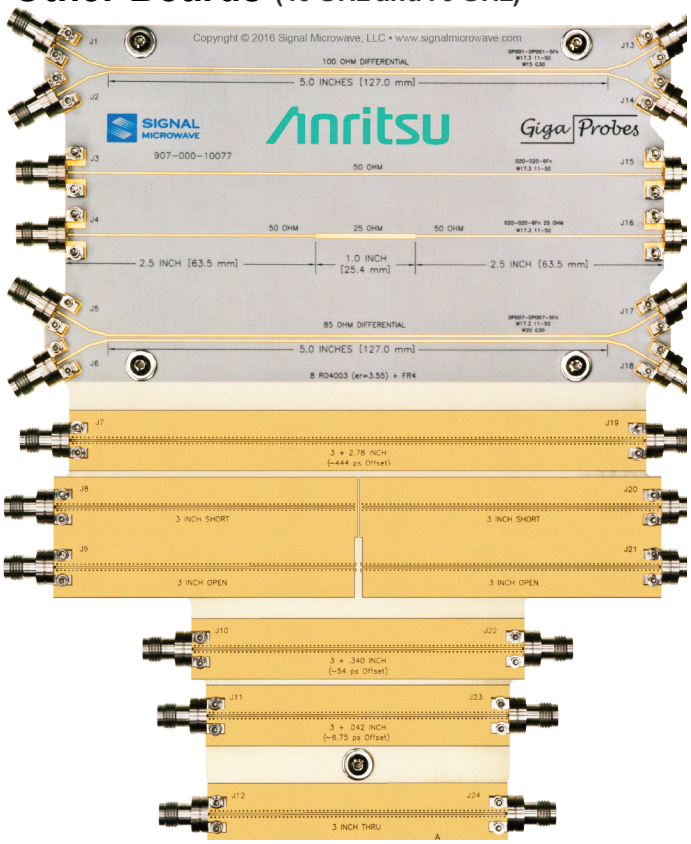
with 40 Ghz TRL/LRL Calibration and DUT Boards

This kit provides a total test fixture solution by providing both the TRL/LRL calibration board to calibrate the VNA to remove the connectors and 4 inches of the PCB trace from the measurement. Each test fixture contains 2.92 mm connectors on each end and a solder point for the SMD component for accurate measurements.

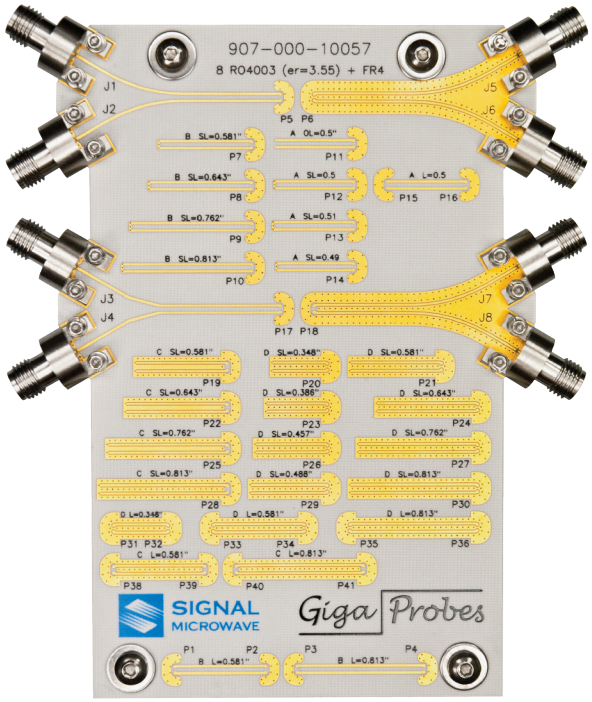


TRL/LRL Calibration Board

Other Boards (40 GHz and 70 GHz)



Part No. 907-xxx-10077



Part No. 907-xxx-10057

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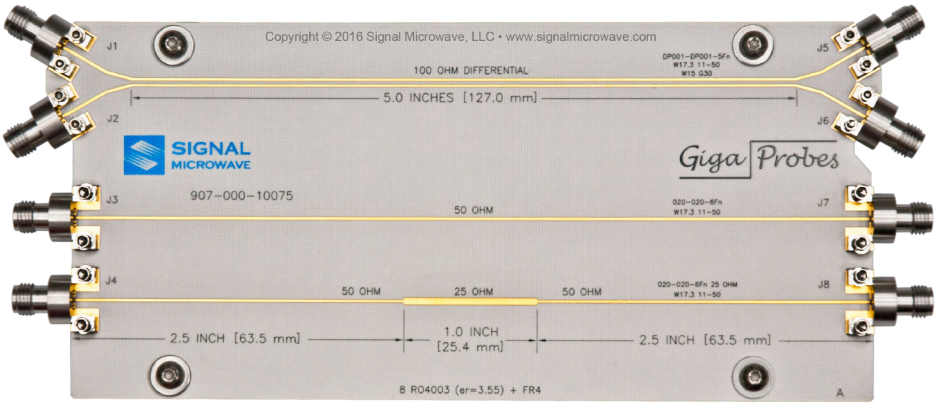
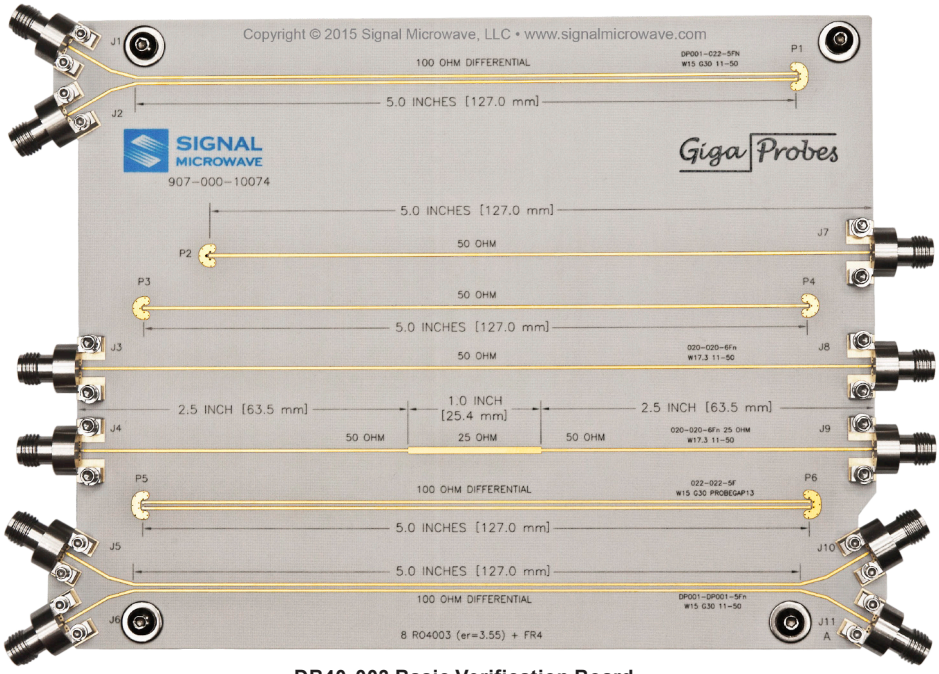
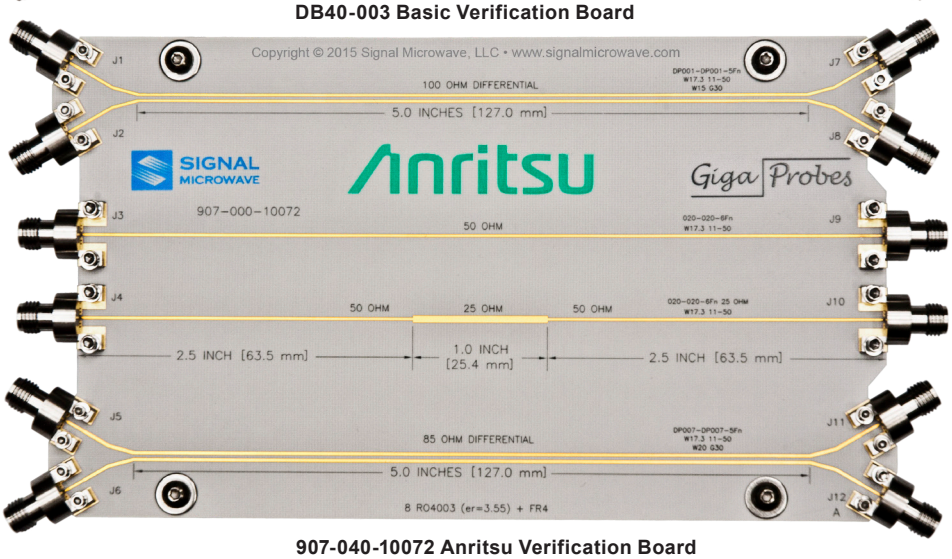
Broadband Test Verification Boards (40 GHz and 70 GHz)



DB40-002 Probe Verification Board



DB40-003 Basic Verification Board



907-040-10072 Anritsu Verification Board

"xxx" is a placeholder to define frequency range depending on connector types.

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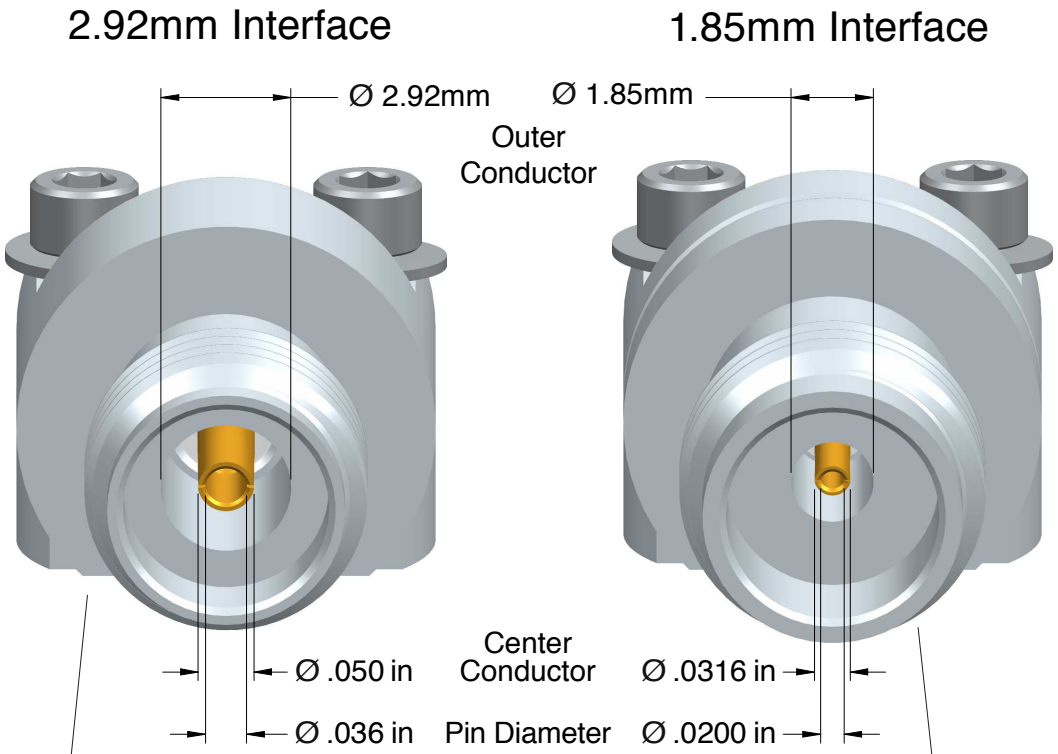
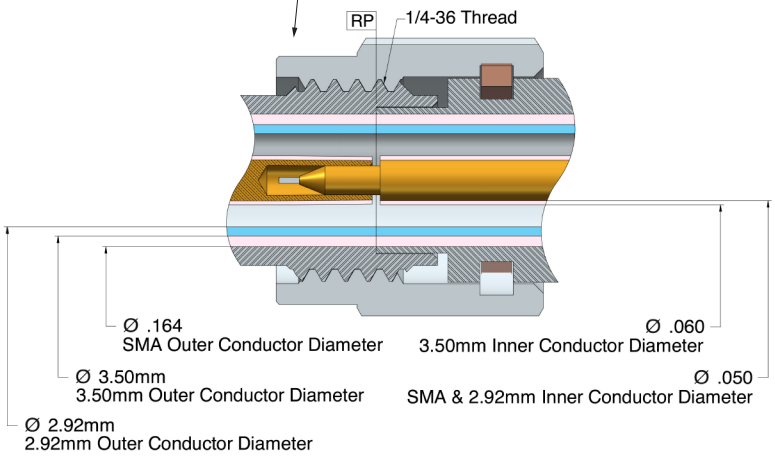
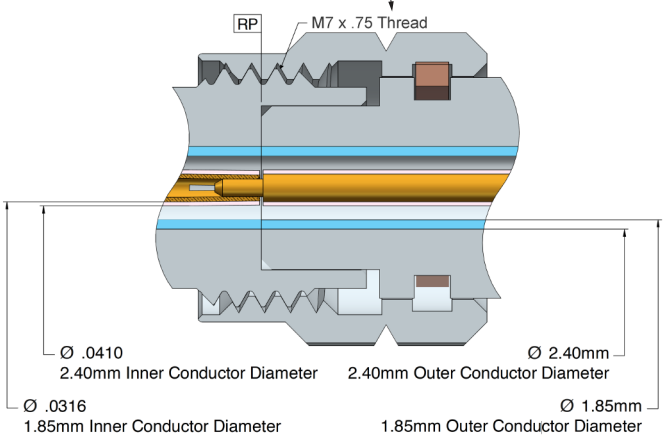
Connector Nomenclature



Connector Compatibility





SMA / 3.5mm / 2.92mm

- SMA interface connectors (18/27 GHz bandwidth)
- 3.5mm interface connectors (33 GHz bandwidth)
- 2.92mm interface connectors (40 GHz bandwidth)
- All of these connectors are compatible with each other

2.40mm / 1.85mm

- 2.40mm interface connectors (50 GHz bandwidth)
- 1.85mm interface connectors (70 GHz bandwidth)
- All of these connectors are compatible with each other

Signal Microwave

Cutaway Side View of a Mated Connector Pair

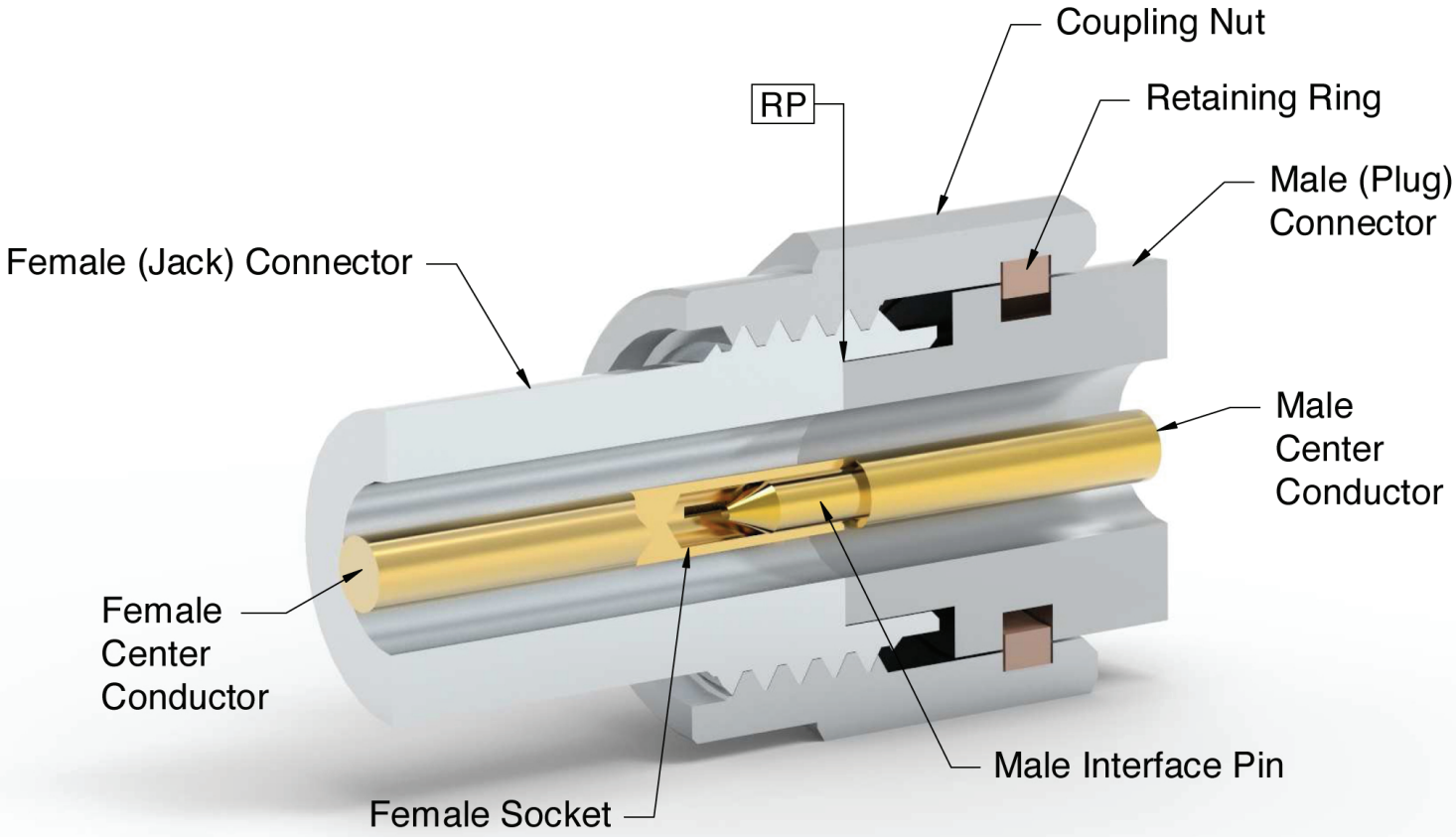
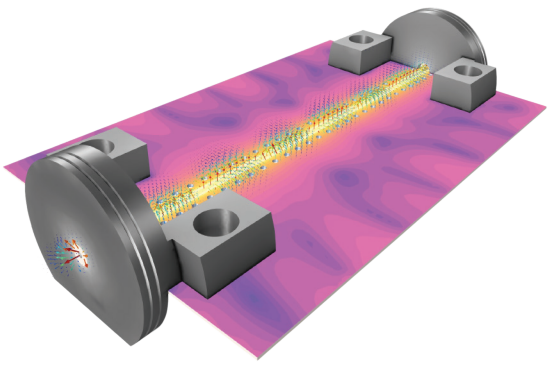
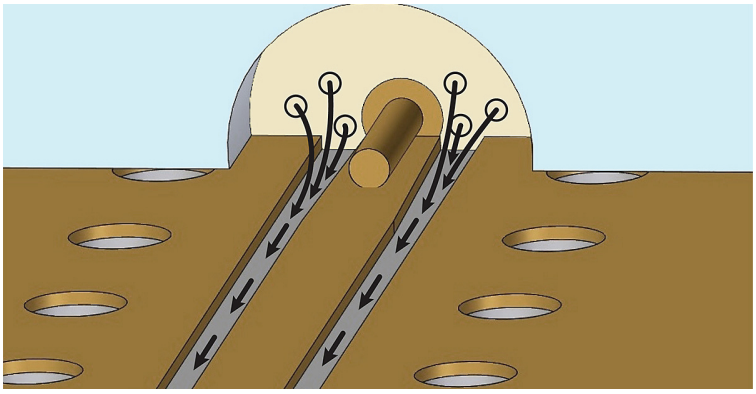


Image made using COMSOL Multiphysics® software and provided courtesy of COMSOL.

PCB Design Resources for Board Mount Connectors

- 3D models for simulation are available at no charge to help customers in their own development efforts.
- "Transparent Connections for 5G and WiGig Testing" that describes using 3D modeling tools to design board launches.





Signal Microwave, LLC

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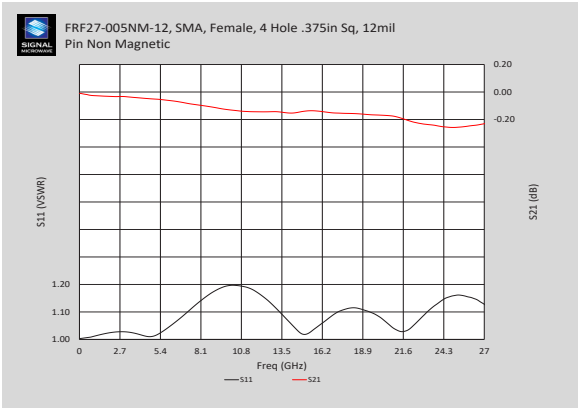
NEW PRODUCT

SMA Nonmagnetic Field Replaceable Connectors

Potential applications are nonmagnetic environments such as cryogenic, superconducting, low PIM, quantum computing, quantum sensing, MRI, and others.

FRF27-005NM-12

FRM27-005NM-12



Typical test data through 27 GHz using FRF27-005NM-12 back-to-back connector pair with test pin.

092023