



**SIGNAL  
MICROWAVE**



**Connector Products January 2025**

# Signal Microwave

## ELF40 2.92 mm (40 GHz) Edge Launch Connectors



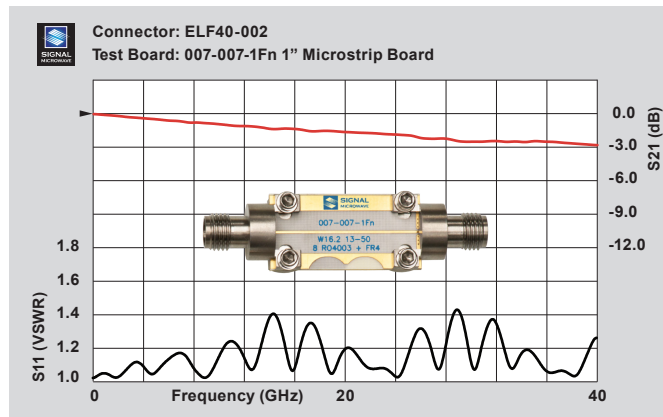
Common Interface  
ELF40



Narrow Profile  
ELF40-001



Standard Profile  
ELF40-002



1" microstrip test board with typical data through 40 GHz

## Edge Launch Drop-in Replacement Connectors

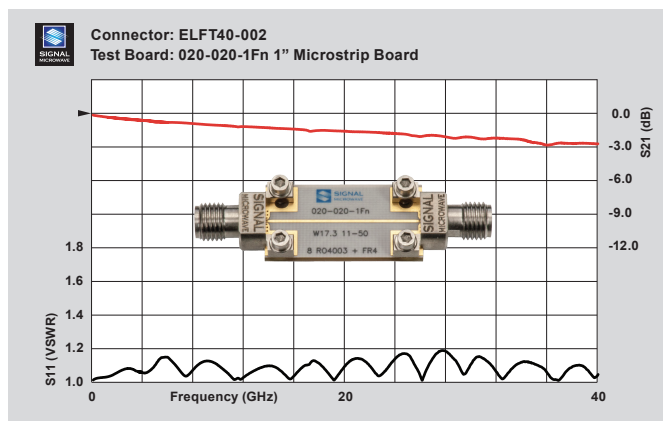
### ELFT40 2.92 mm (40 GHz)



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

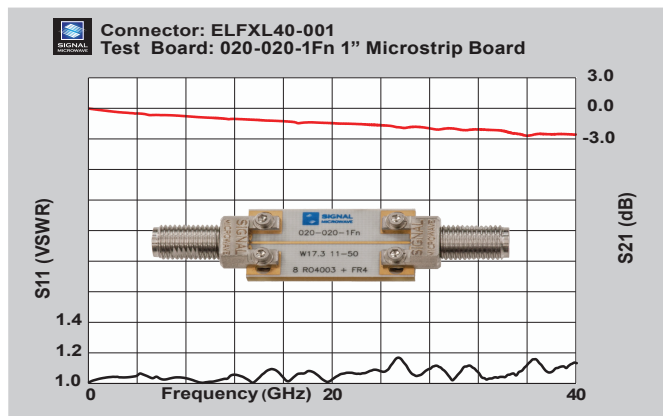
### ELFXL40 2.92 mm (40 GHz)



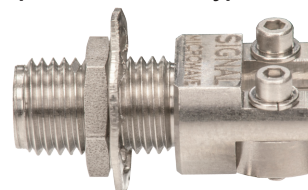
Common Interface  
ELFXL40



Narrow Profile  
ELFXL40-001



1" microstrip test board with typical data through 40 GHz





## 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



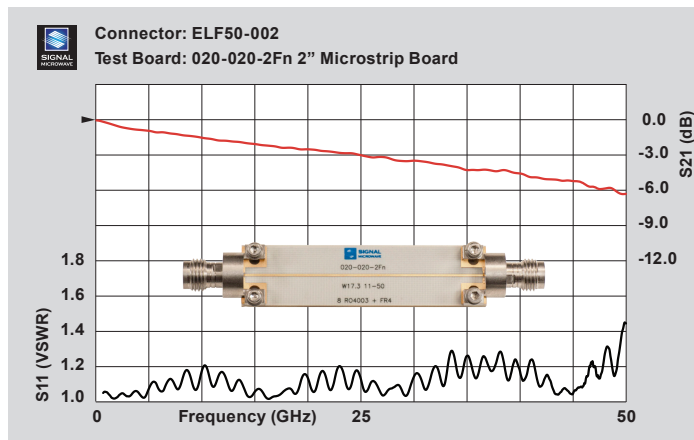
Common Interface  
ELF50



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



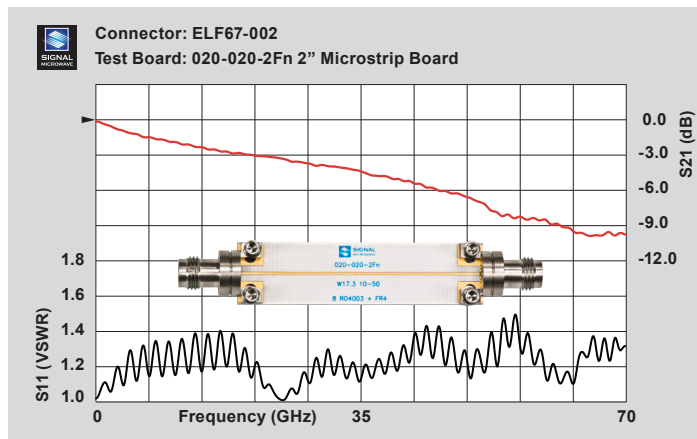
Common Interface  
ELF67



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



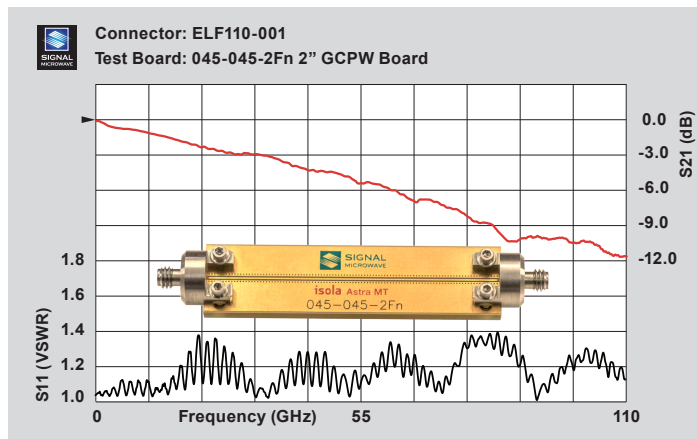
Common Interface  
ELF110



Narrow Profile  
ELF110-001



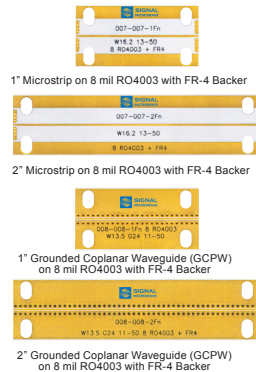
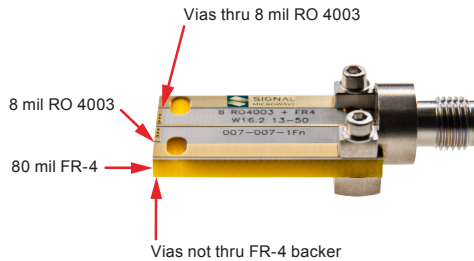
Standard Profile  
ELF110-002



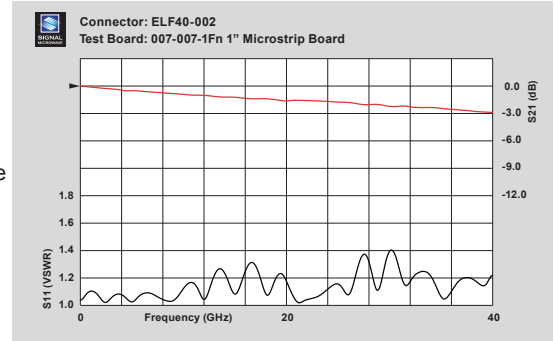
2" GCPW test board with typical data through 110 GHz

## 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



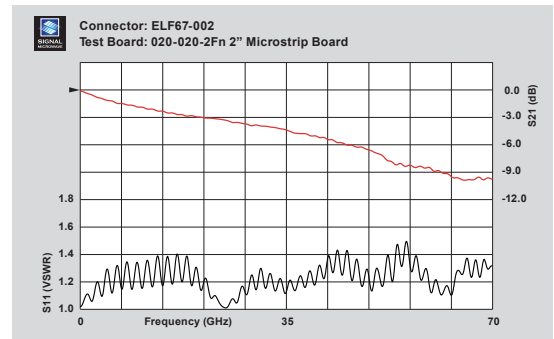
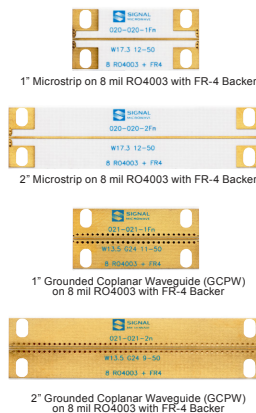
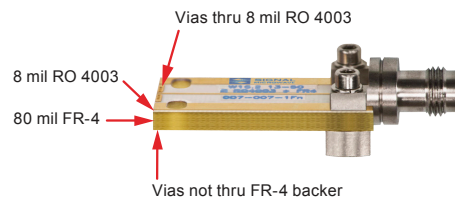
Typical test Data is shown in the Edge Launch Connector section. Demo boards are also available with sample connectors and test data.



### 40 GHz Test Board Part Numbers:

<b>007-007-1Fn</b>	1" Microstrip
<b>007-007-2Fn</b>	2" Microstrip
<b>008-008-1Fn</b>	1" Grounded Coplanar Waveguide (GCPW)
<b>008-008-2Fn</b>	2" Grounded Coplanar Waveguide (GCPW)

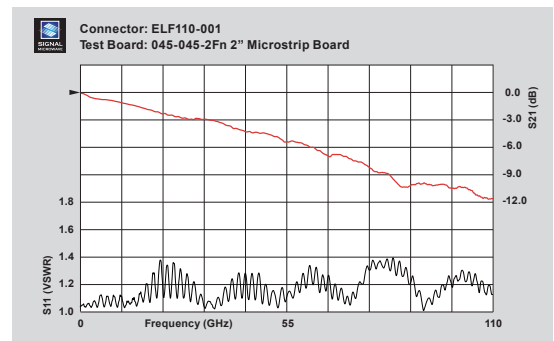
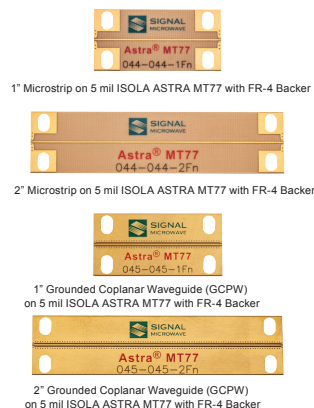
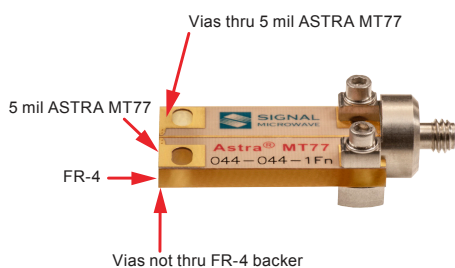
## Test Boards for Edge Launch Connectors (70 GHz)



### 70 GHz Test Board Part Numbers:

<b>020-020-1Fn</b>	1" Microstrip
<b>020-020-2Fn</b>	2" Microstrip
<b>021-021-1Fn</b>	1" Grounded Coplanar Waveguide (GCPW)
<b>021-021-2Fn</b>	2" Grounded Coplanar Waveguide (GCPW)

## Test Boards for Edge Launch Connectors (110 GHz)



### 110 GHz Test Board Part Numbers:

<b>044-044-1Fn</b>	1" Microstrip
<b>044-044-2Fn</b>	2" Microstrip
<b>045-045-1Fn</b>	1" Grounded Coplanar Waveguide (GCPW)
<b>045-045-2Fn</b>	2" Grounded Coplanar Waveguide (GCPW)

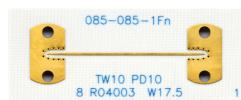
All test board designs are available to customers at no charge in .pdf and .dxf formats.  
Demo boards are also available with sample connectors and test data.

## Top Launch Connectors

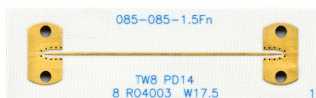
### TLF40 2.92 mm (40 GHz)



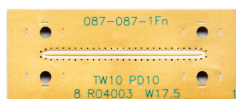
- Edge Launch Type Performance Anywhere on the Board
- 2.92 mm Connector for high speed digital industry with superior electrical performance
- Compression fit, screw-on mounting, does not require soldering



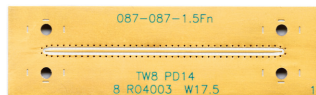
1" Microstrip on 8 mil RO4003 with FR-4 Backer



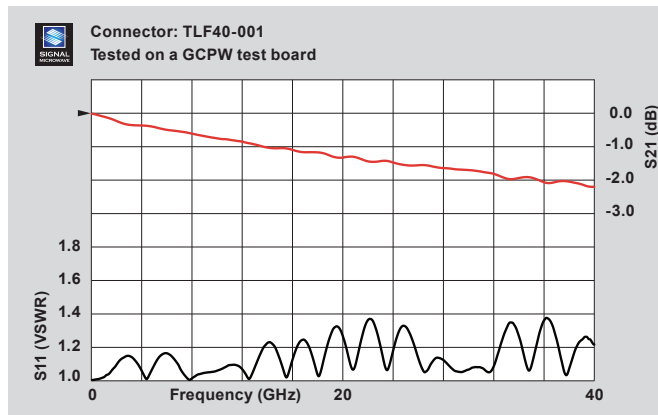
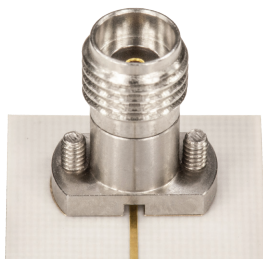
1.5" Microstrip on 8 mil RO4003 with FR-4 Backer



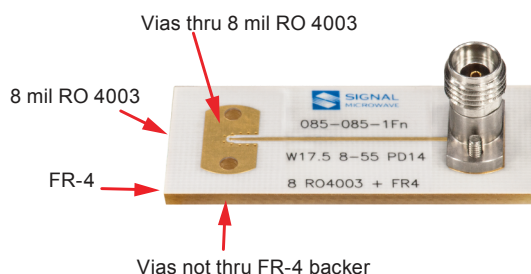
1" Grounded Coplanar Waveguide (GCPW) on 8 mil RO4003 with FR-4 Backer



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



1" microstrip test board with typical data through 40 GHz

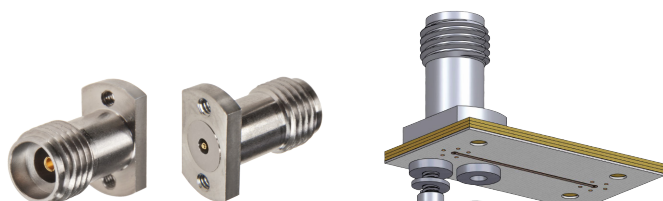


#### 40 GHz Test Board Part Numbers:

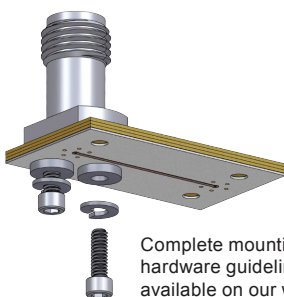
085-085-1Fn	1" Microstrip
085-085-1.5Fn	1 1/2" Microstrip
087-087-1Fn	1" Grounded Coplanar Waveguide (GCPW)
087-087-1.5Fn	1 1/2" Grounded Coplanar Waveguide (GCPW)

## Vertical Launch Connectors

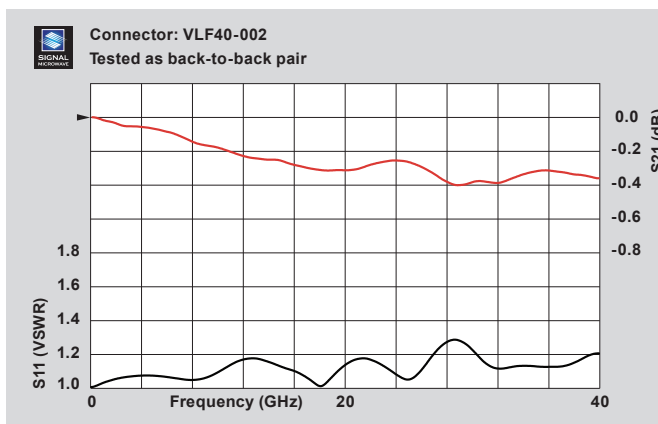
### VLF40 2.92 mm (40 GHz)



VLF40-002



Complete mounting hardware guidelines available on our website



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

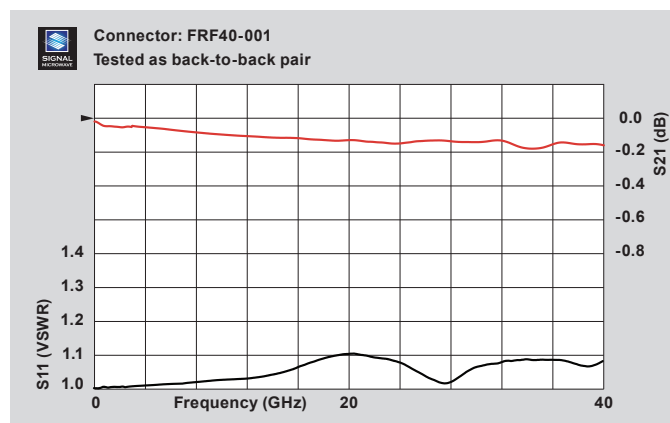
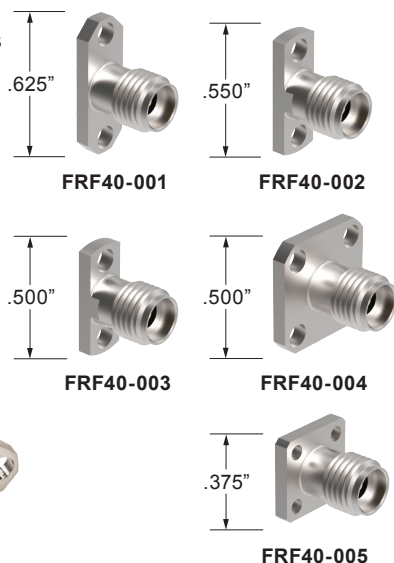


- 2.92 mm Connector for high speed digital industry with superior electrical performance
- Compression fit, screw-on mounting, does not require soldering

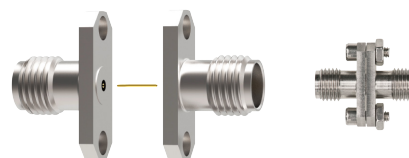
## Field Replaceable Connectors

### 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 -55° to +105°



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



## SMA Nonmagnetic Replaceable Connectors

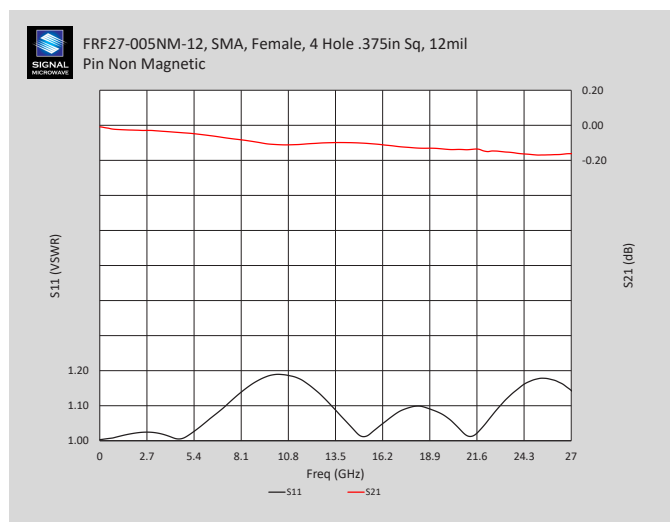
### FRF27-005NM-12 FRM27-005NM-12



FRF27-005NM-12

FRM27-005NM-12

- Nonmagnetic Connectors
- SMA Interface
- Standard 2 and 4 Hole Flange Sizes
- Rear Socket for 12 mil (.012", .3048 mm) pins
- Beryllium Copper (BeCu) center contact - gold plated only (no nickel)
- Phosphor Bronze housing - gold plated only (no nickel)
- Ultem Dielectric Bead



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



# Signal Microwave

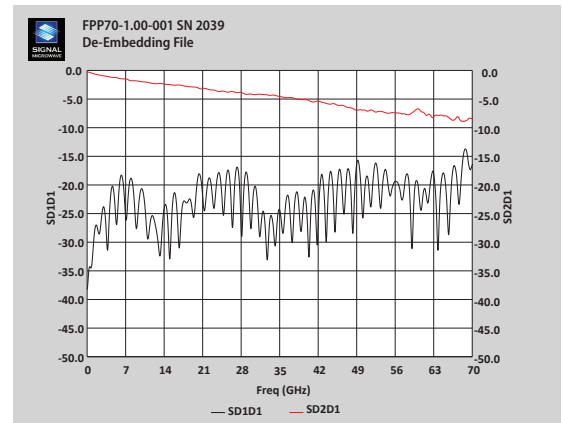
## FPP Probe Series

- 100 ohm true odd mode differential
- 2 **signal** pins only – no ground pins
- Multiple bandwidths  
40 GHz, 50 GHz, 70 GHz, and 110 GHz
- Multiple probe pin pitches  
1.0 mm, 0.8 mm, and 0.6 mm pin pitches
- Multiple 3 hole mounting configurations  
PM-001: X- axis, y- axis, and up/down axis control  
PM-002: X- axis, y- axis, and theta angle axis control
- Straight 1 hole mounting
- Custom mounting configurations available
- Multiple pin lengths available as options
- 1 year warranty



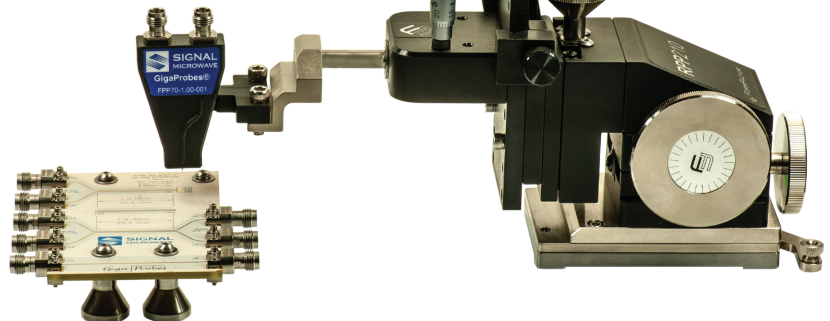
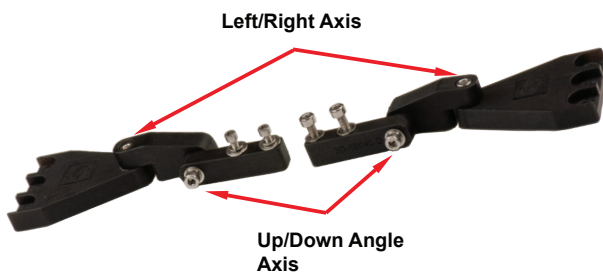
De-embedding Board

## Probe 70 GHz s-parameters

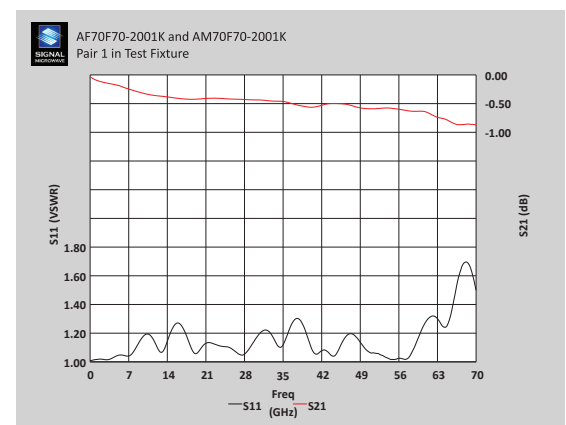
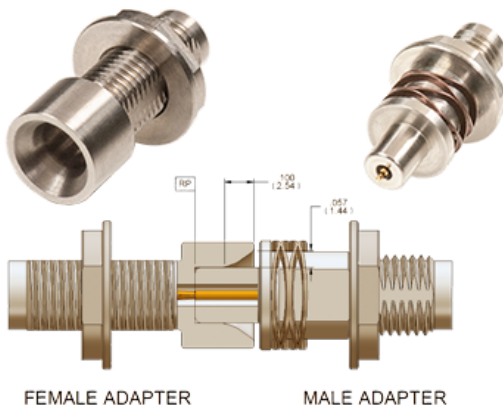


Patent 10852322  
Patent 11175311  
Patent 11543434  
Other Patents Pending

### PM-001



## 1.85 mm Blind Mate Interconnect System AF70F70 & AM70F70



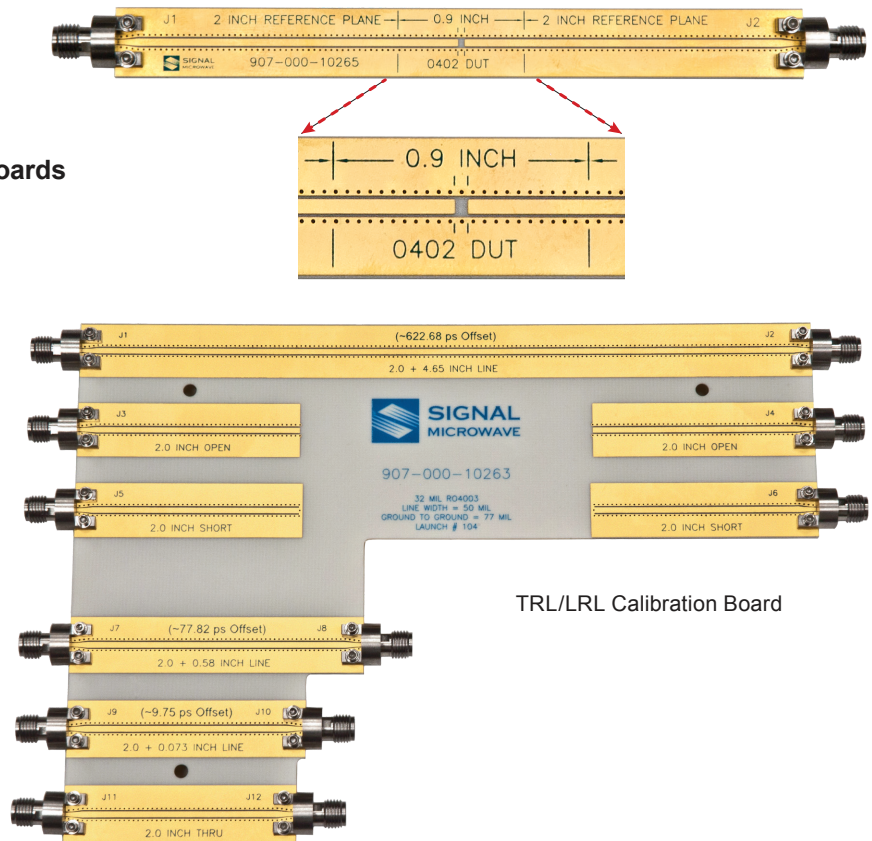
- A new 1.85 mm interface blind mate connector system with 70 GHz bandwidth.
- Uses a float mount design for alignment and a spring to apply force.
- A better electrical performance alternative to current SMPM interface blind mate systems.

## Calibration Boards

### Turnkey 0402 Package Test System

#### with 40 Ghz TRL/LRL Calibration and DUT Boards

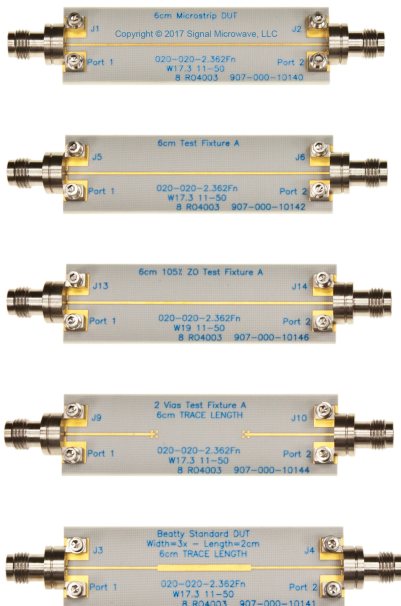
This kit provides a total test fixture solution by providing both the TRL/LRL calibration board to calibrate the VNA to remove the connectors and 4 inches of the PCB trace from the measurement. Each test fixture contains 2.92 mm connectors on each end and a solder point for the SMD component for accurate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



## 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.

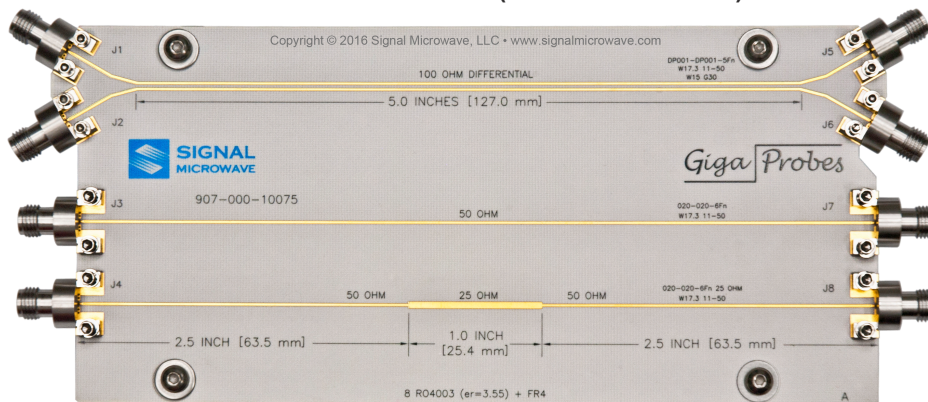
### Five Board Types



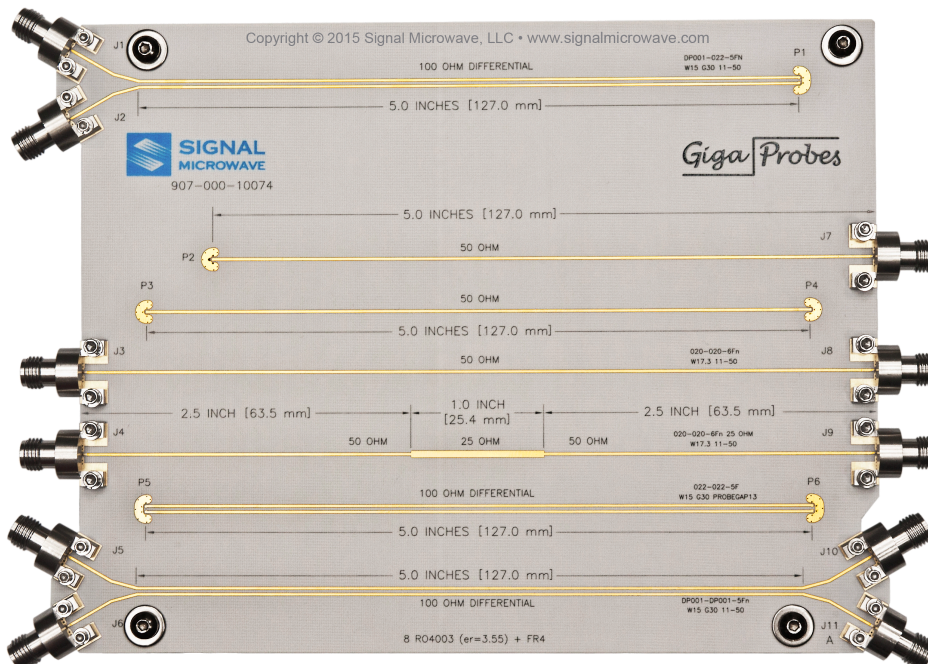
- 6 cm DUT Microstrip**  
The de-embedded kit takes a known DUT which can be directly measured and the results saved. The data for the DUT is established at NIST traceable reference planes and therefore is repeatable.
- 6 cm Test Fixture**  
A set of 2 test fixtures with good performance can be measured 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.
- 6 cm 105% Z<sub>0</sub> Test Fixture**  
A degraded set of fixtures with 105% impedance is also included to challenge the de-embedding algorithm.
- 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.
- 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 e-embedding.



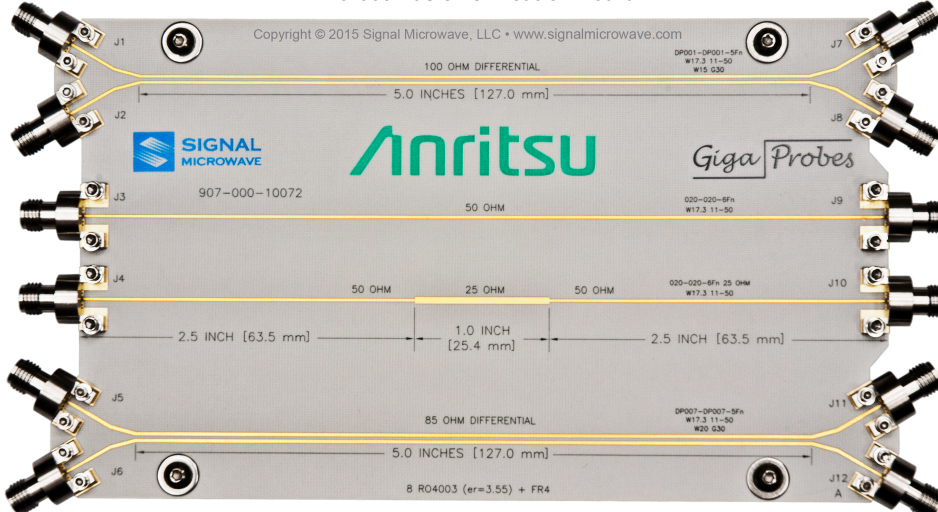
## Broadband Test Verification Boards (40 GHz and 70 GHz)



**DB40-002 Probe Verification Board**



**DB40-003 Basic Verification Board**



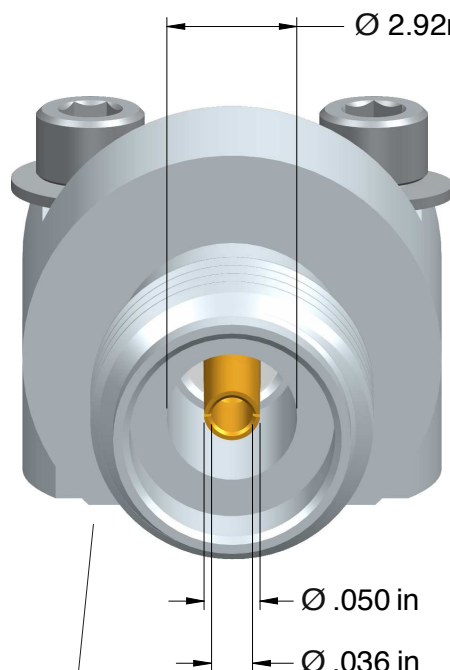
**907-040-10072 Anritsu Verification Board**

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

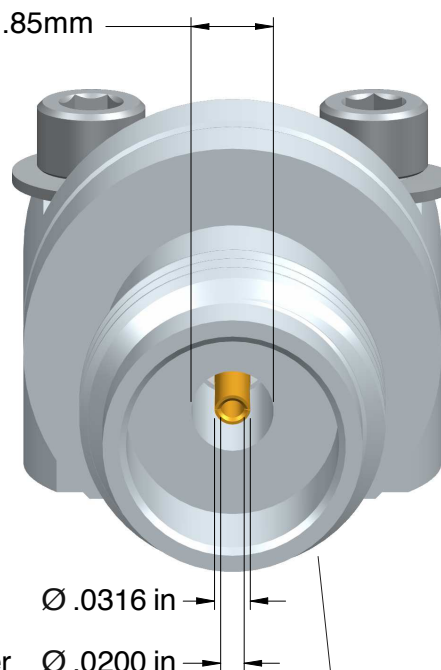


## Connector Nomenclature

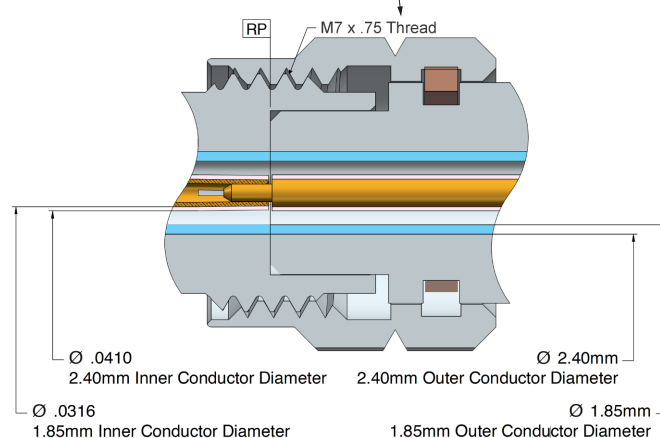
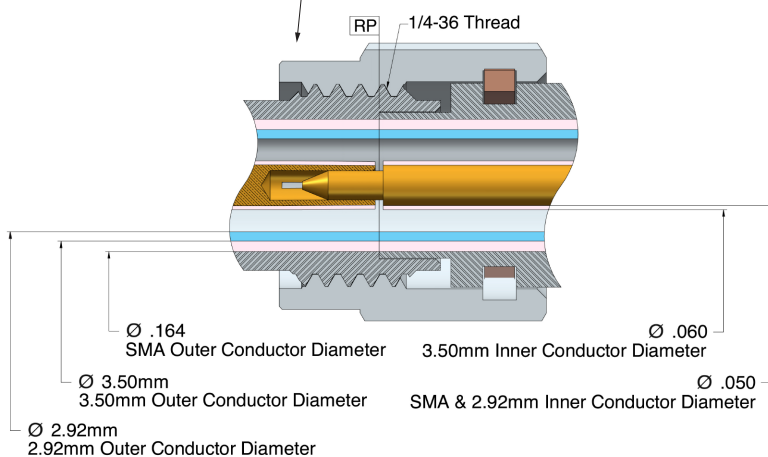
### 2.92mm Interface



### 1.85mm Interface



## 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

Cutaway Side View of a Mated Connector Pair

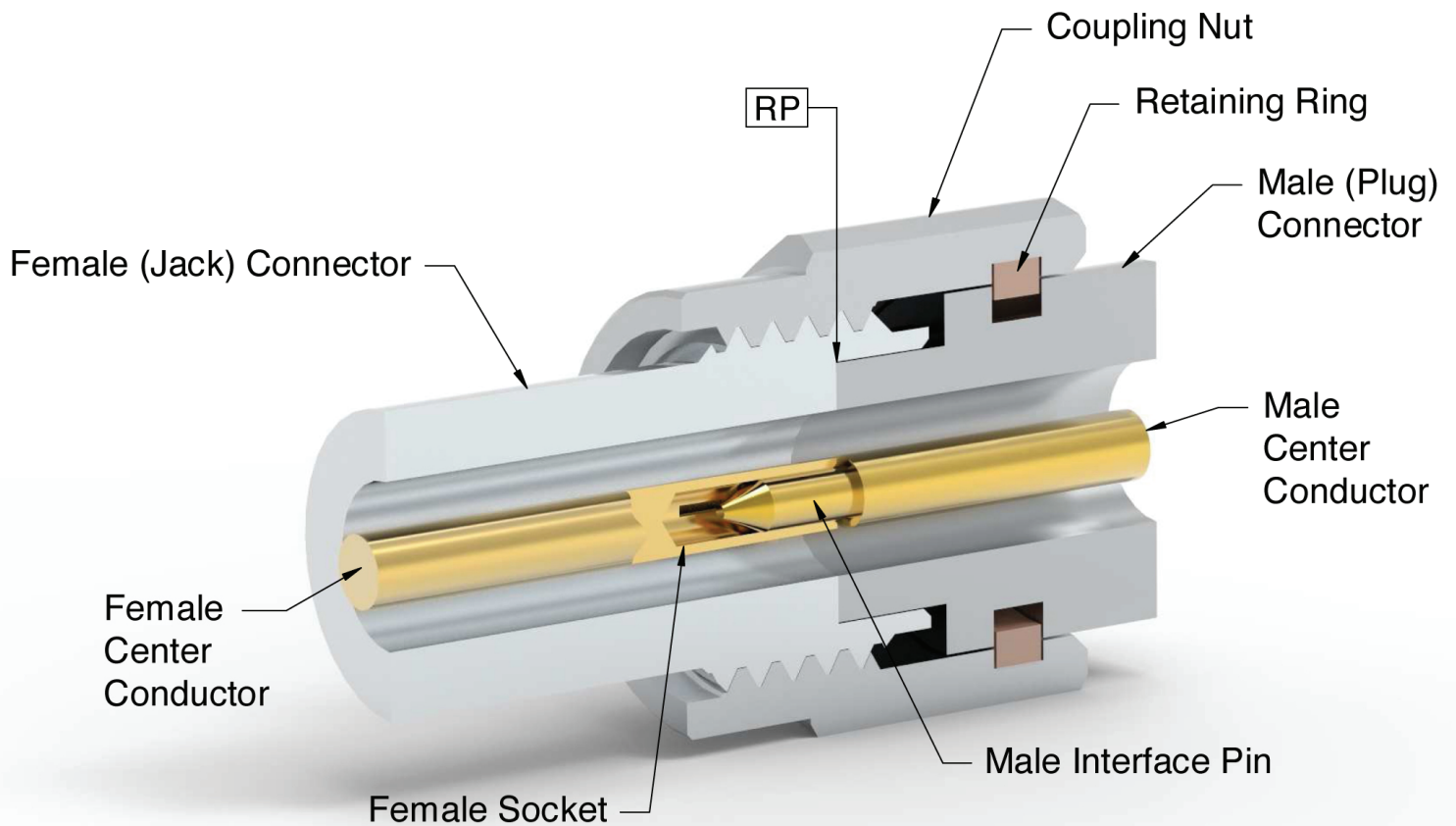
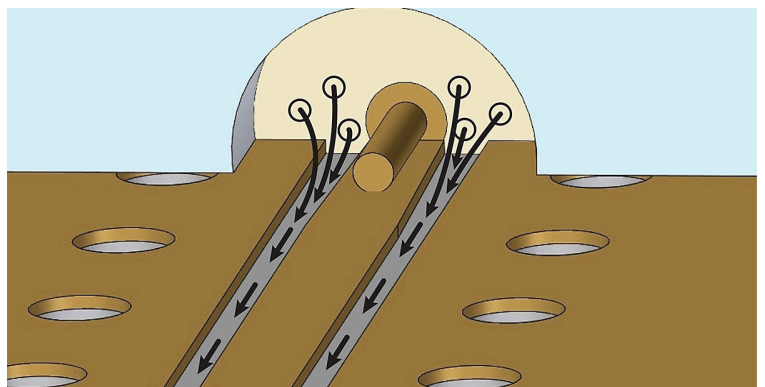
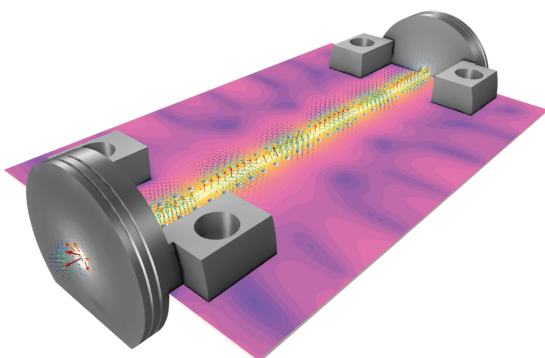


Image made using COMSOL Multiphysics® software and provided courtesy of COMSOL.

## 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.



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## NEW PRODUCT

### 50GHz Top Launch Connectors

**TLF50-001**



### 50 GHz Vertical Launch Connectors

**VLF50-001**



### Signal Microwave, LLC

Tempe, Arizona  
info@signalmicrowave.com  
www.signalmicrowave.com  
(480) 322-4992

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