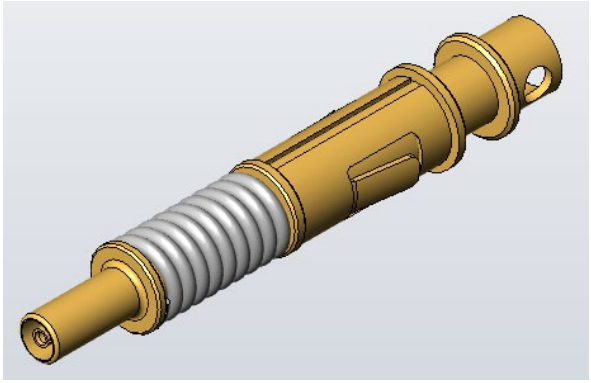
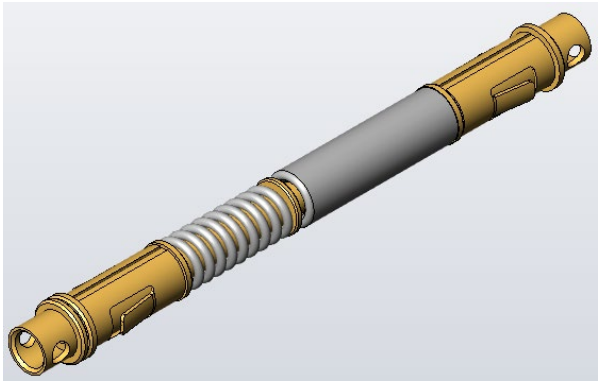
RF Characterization Report

GPCC-20-V-P-C-XX-047A-SD-1



Mating to

GPCC-20-V-S-C-XX-047A-SD-2



Test Date: May 2024 thru April 2025

Description:
RF Coaxial Contact Size 20, 50 Ohm, VITA 90 VNX+™ Series, Pin mating to Socket, ST, Contact Assembly

Samtec Inc.
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Report Revision: 06/01/2026

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Test Setup Information

Scope:

Provide standing wave ratio, insertion loss and isolation performance for GPCC, Pin mating to Socket, ST, Contact on RF047-A assemblies.

Instrument Setup & Test Accessories:

Network Analyzer	Keysight PNA N5227B
Averaging Factor	1
Smoothing	Off
IF Bandwidth	1 KHz
Sweep Start	10 MHz
Sweep End	110 GHz
Points	11000
Test Cables	Keysight N5293AX01 (110GHz Extenders)

Calibration Type:

A Keysight mechanical calibration is performed for N5227B using the Keysight 1.0mm MCAL 85059B.

Calibration Kit	Keysight MCAL 85059B

Adapter Use:

Keysight 1.0 mm to 1.0 mm adapters were used, but adapters effects were removed from the measurement by MCAL.

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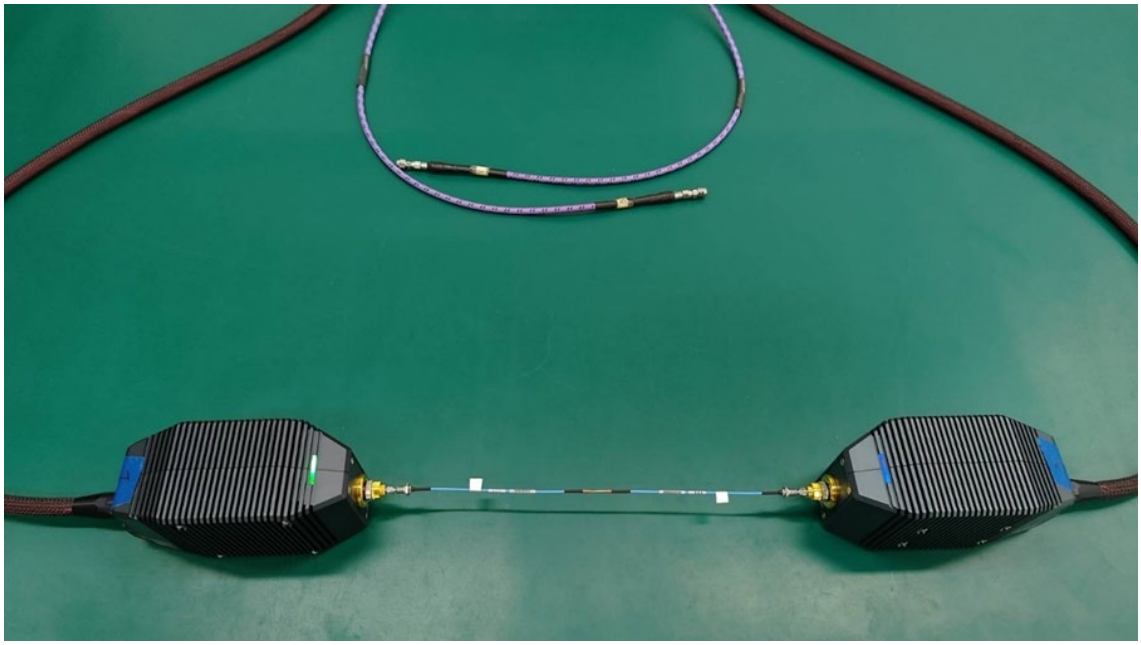
GPCC-20-X-X-X-XX-XXXX-SD-X Test Definition

Part Number	Gender
GPCC-20-V-P-C-XX-047A-SD-1	Pin
GPCC-20-V-S-C-XX-047A-SD-2	Socket

The performance of mated connector pairs was measured in various configurations in and out of the RF Blocks.

VSWR Test:
The test setup outside of the RF Blocks was as in the photo below. A pair of RF047-A cable assemblies mated at the Size 20 ends was connected to the 110 GHz heads of the PNA. One assembly had a 1mm Jack on one end and a Size 20 male on the other. The other assembly had a 1mm Jack on one end and a Size 20 female on the other. The PNA was calibrated to the end of male 1mm interfaces. The raw measurement from 0 to 110 GHz included both cable assemblies. Time bandpass gating in the PNA was used to gate around the Size 20 mated pair.

Test setup for mated 6” assemblies outside of the RF Blocks:



Test setup for mated 12” assemblies outside of the RF Blocks:

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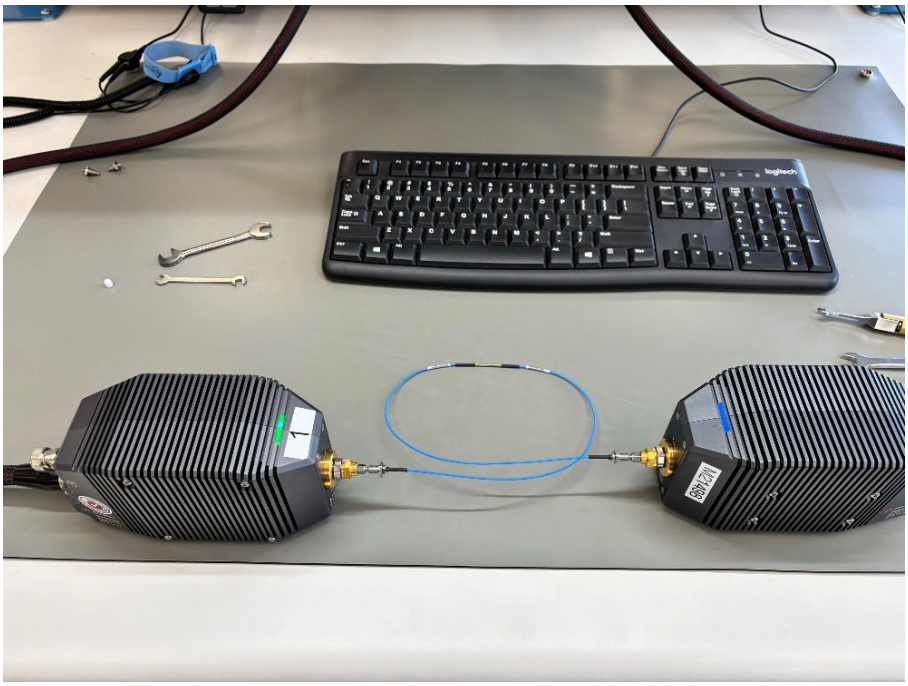
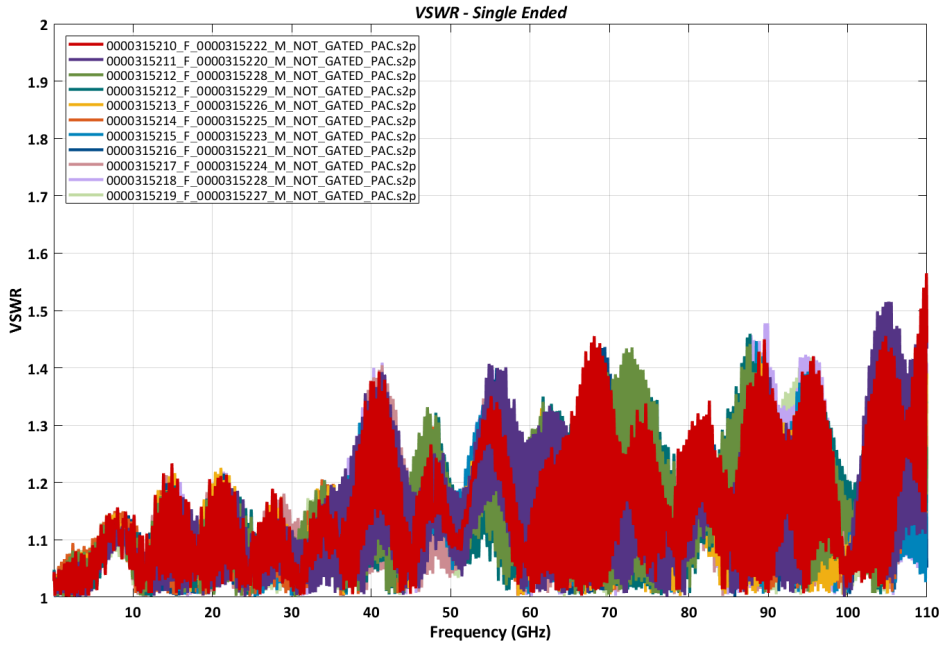


Raw VSWR measurements for mated 12” assemblies outside of the RF Blocks:



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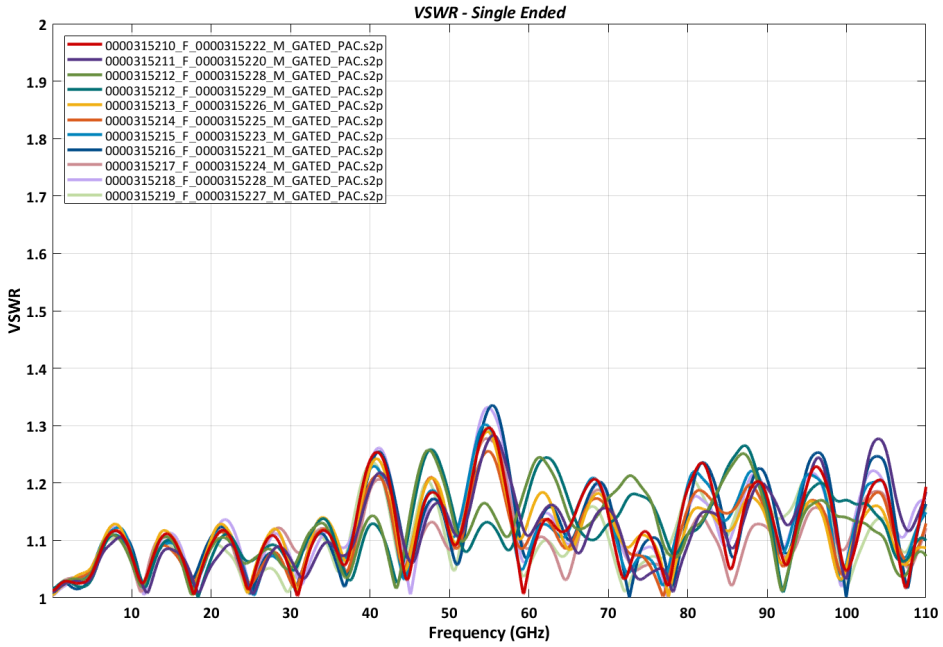
Gated VSWR measurements for the Size 20 connector mated pairs outside of the RF Blocks:



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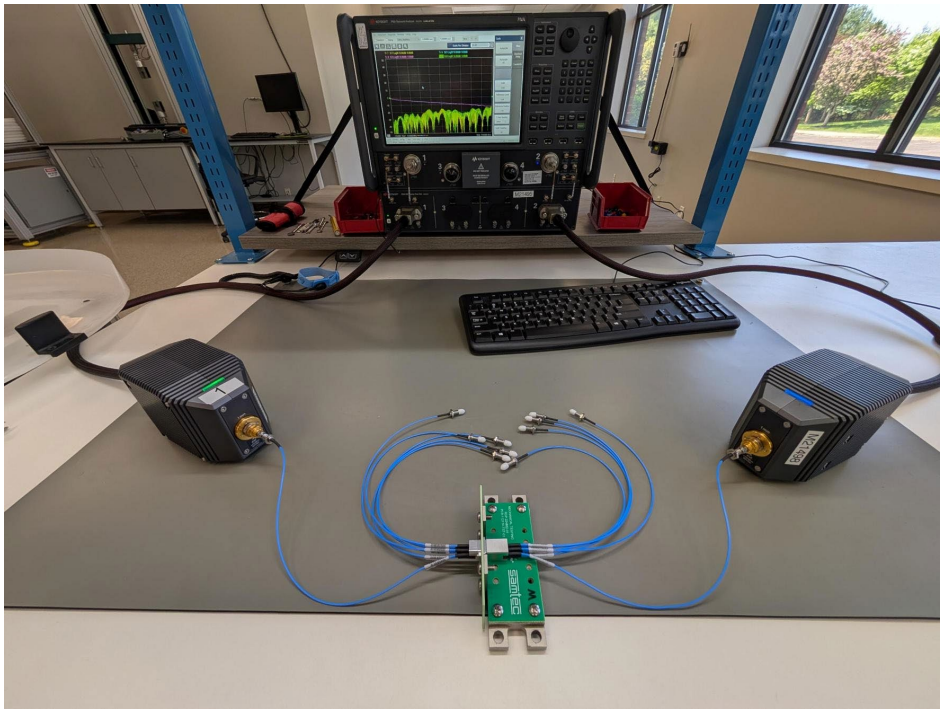
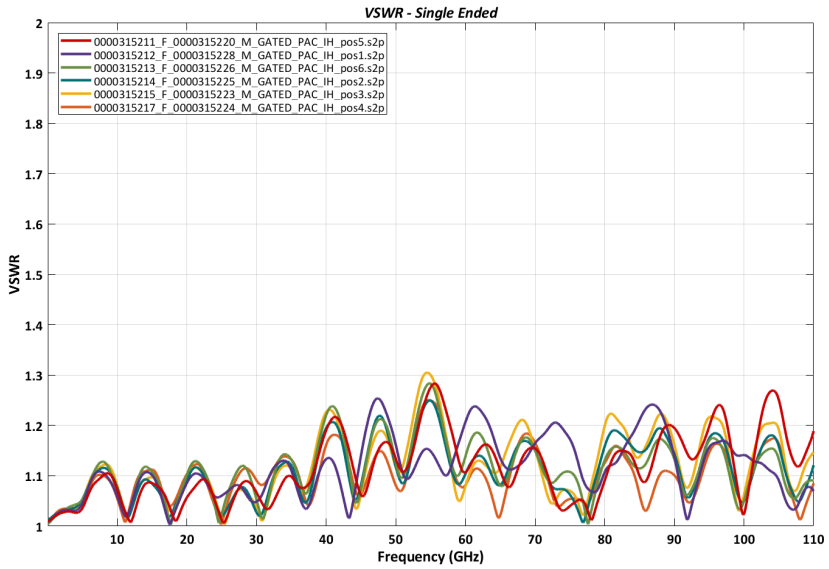
VSWR Test Setup in the RF Blocks:



Gated VSWR measurements for the Size 20 connector mated pairs in the six pack RF Blocks:



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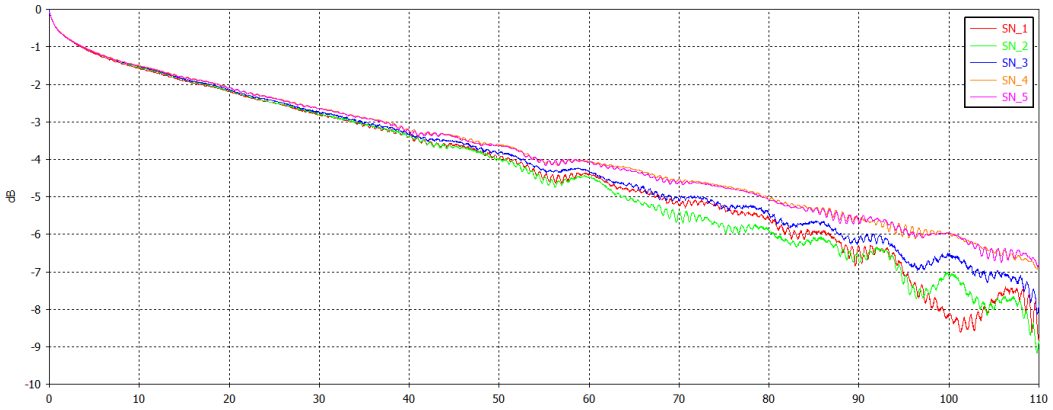
Insertion Loss Test:
The raw Insertion loss of 6” and 12” Size 20 to 1mm RF047-A cable assemblies was measured outside of the RF Blocks.

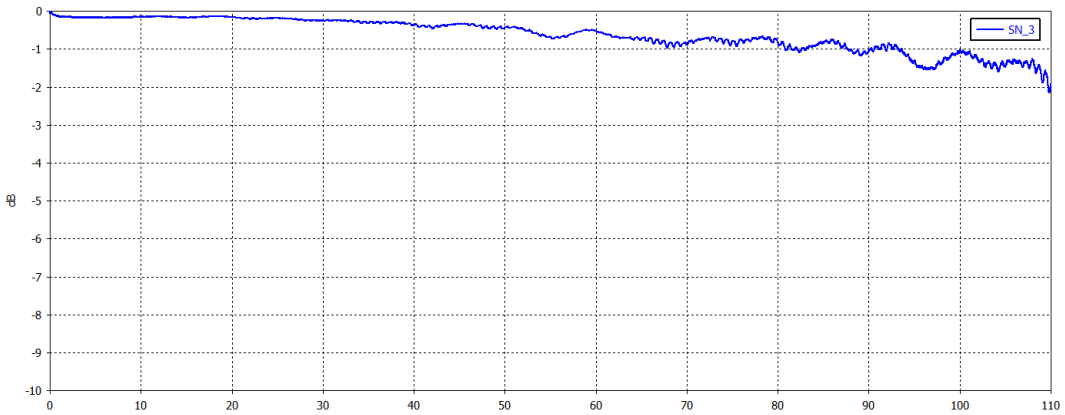
Typical Raw Insertion Loss for 6” Male Size 20 Cable Assembly Mated to 6” Female Size 20 Cable Assemblies:



The raw data for the mated pair of cable assemblies was processed as follows to remove the loss of the cable and 1mm connectors:

1.) The losses of the 1mm Jacks were calculated from the data for two 1mm Jack-to-1mm Jack RF047-A cable assemblies of different length (6” & 12”). A data divide was performed to remove those losses from the raw data for the mated 1mm Jack-to-Size 20 contact cable assemblies.
2.) The loss per mm of two 1mm Jack RF047-A cable assemblies was calculated from raw data for those assemblies. The result of step 1 was processed to remove the cable losses by performing a second data divide.

Typical De-Embedded Insertion Loss for the Size 20 Connector mated pair:



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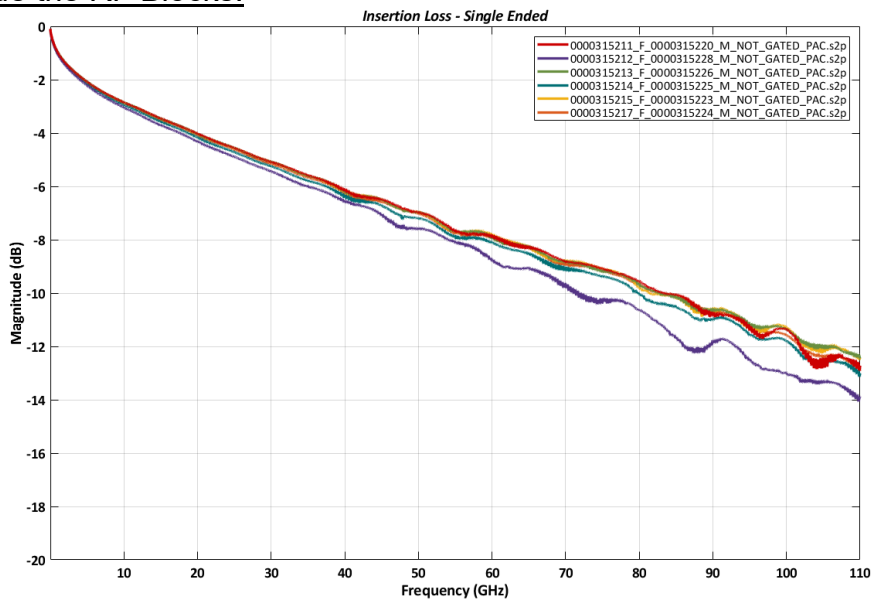
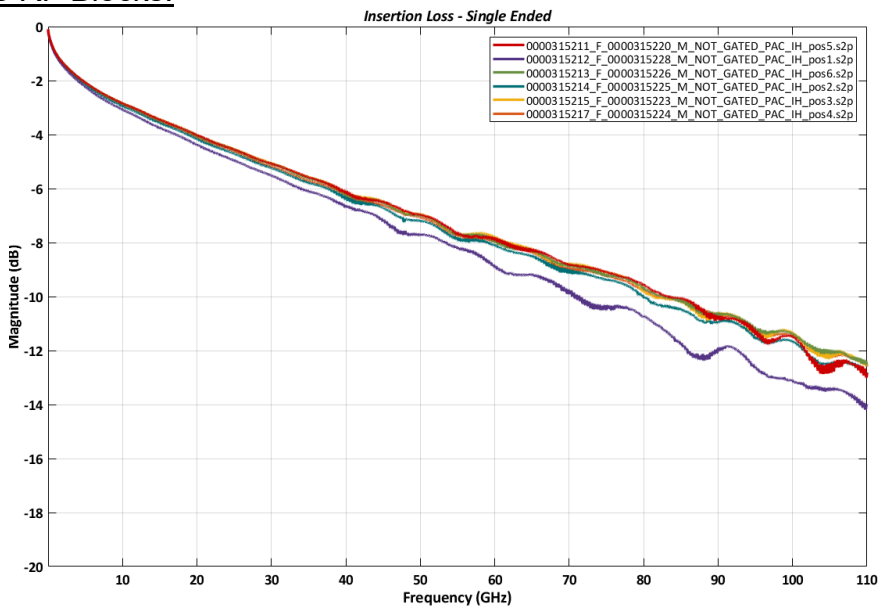
To demonstrate the effect on IL of having the cable assemblies loaded in the RF Blocks or not, the IL of the 12-inch assemblies used for the VSWR measurements was measured in and outside the blocks.

Raw IL outside the RF Blocks:



Raw IL in the RF Blocks:



The difference in loss inside and outside of the RF Blocks was negligible and no suckouts were observed.

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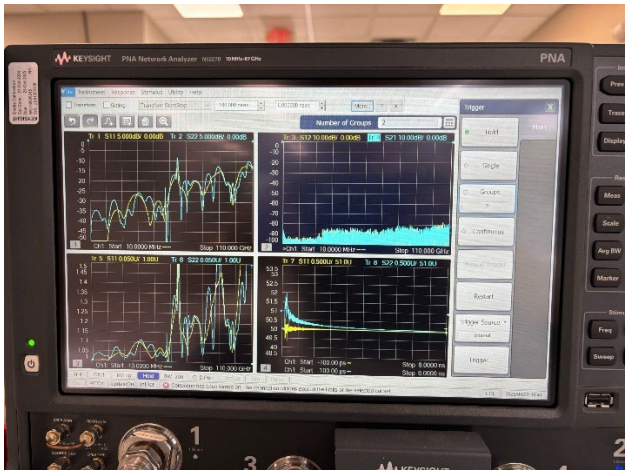
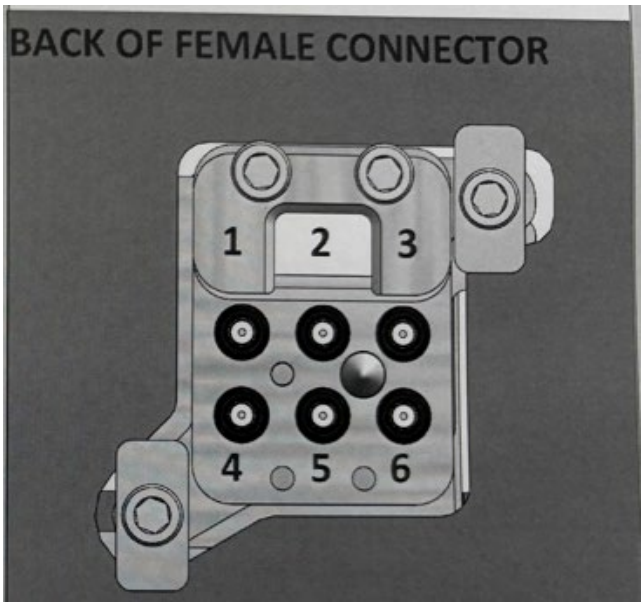
Isolation Test:

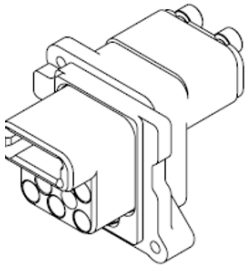
The IF bandwidth of the analyzer was reduced to 300 Hz to lower the noise floor of the measurement. The noise floor was established by terminating the ports of the 110 GHz heads with 50 Ohm loads and performing the sweep.



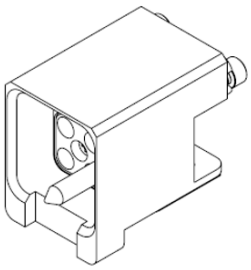
The Position Mapping of the Six Pack RF Blocks is as follows:



RSP-224881-01-ASM
GPCC BACKPLANE
BLOCK ASSEMBLY



RSP-224882-01-ASM
GPCC EDGE CARD
BLOCK ASSEMBLY



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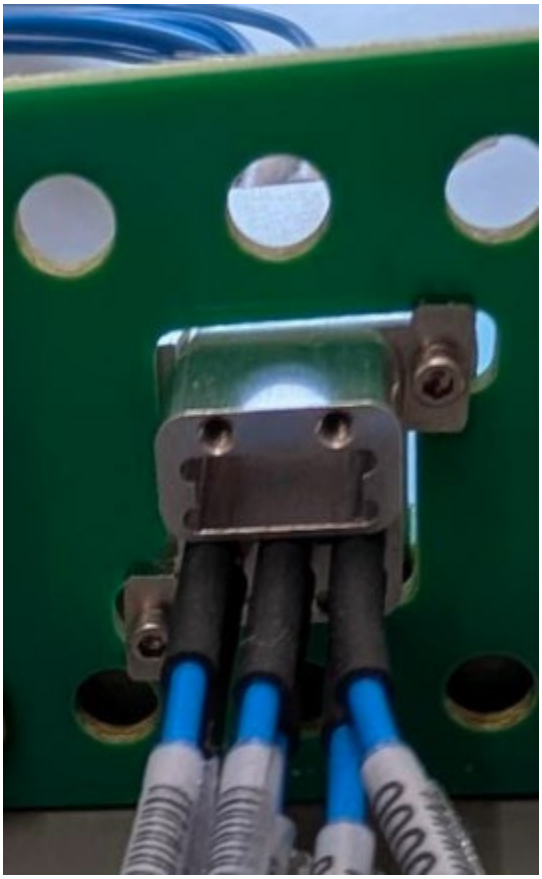

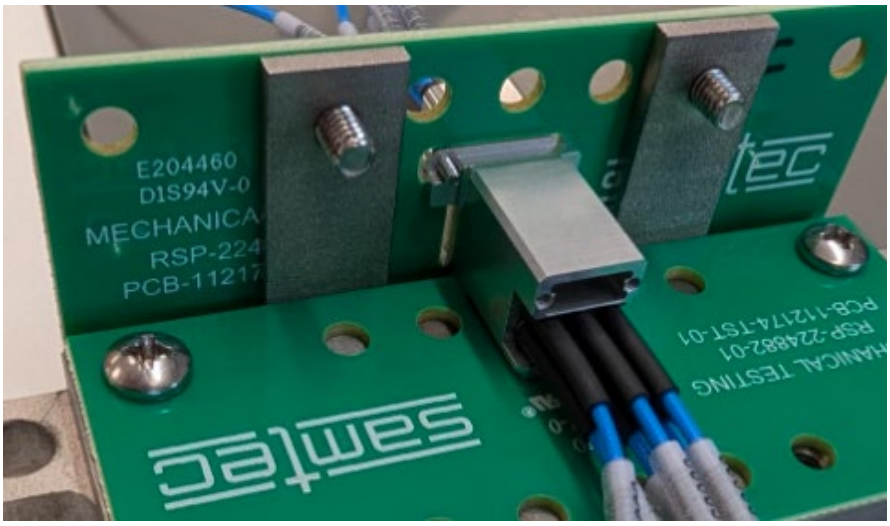

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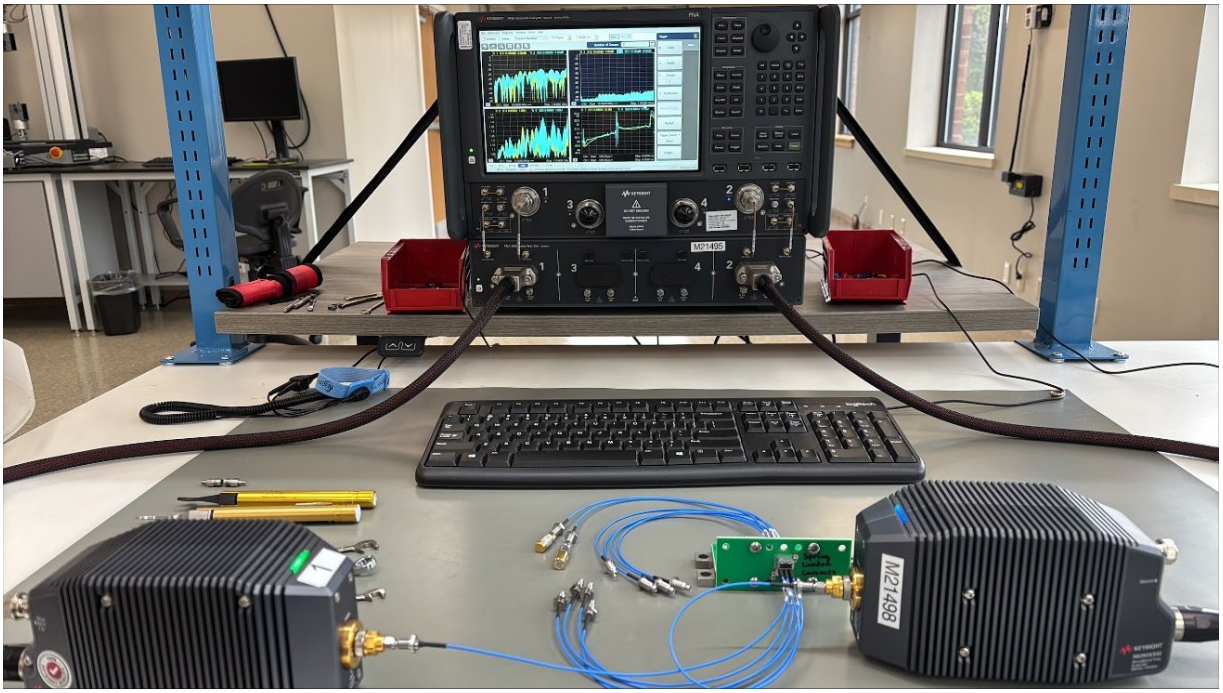
Port 1 of the VNA was connected to Position 2 for each test and Port 2 of the VNA was connected to Positions 1, 3 and 5 sequentially to test isolation for positions 2 and 1, positions 2 and 3 and positions 2 and 5. In each case the cable end that was not connected to the VNA was terminated with a 50 Ohm load from the 1mm cal kit.



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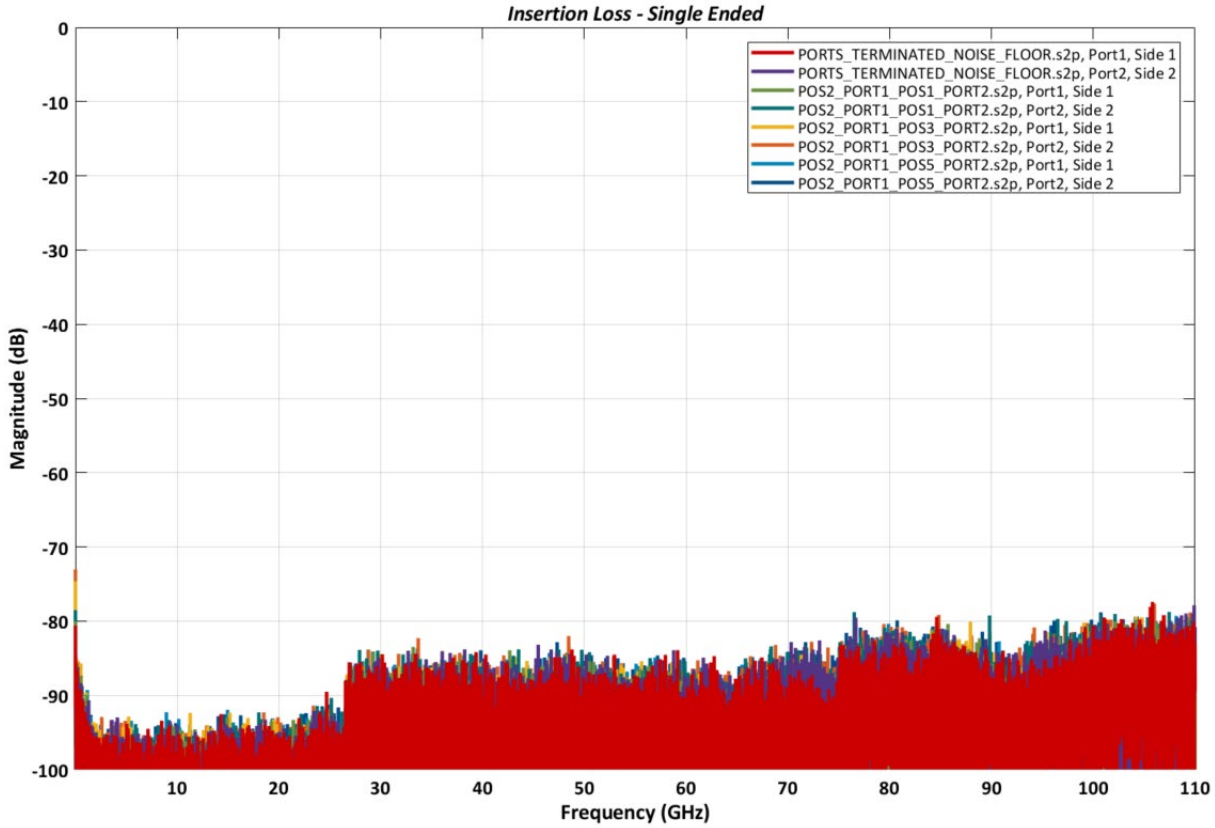

In each case the Isolation was at or below the noise floor of the measurement.