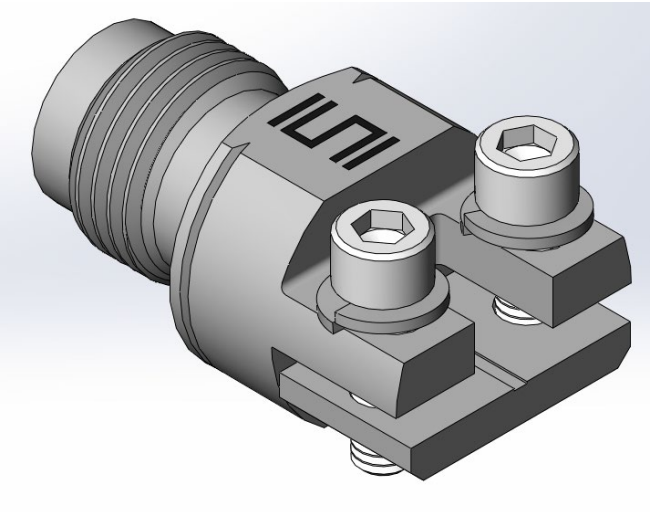
RF Characterization Report

185-J-P-EP-ST-EL-01



Test Date: Apr 2023

Description
50 Ohm 1.85 mm Jack, Compression Mount, Edge Launch

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Report Revision: 6/14/2023

Series: 185
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Test Setup Information

Scope:

Provide standing wave ratio, return loss and insertion loss performance parameters for the Samtec 50 Ohm 1.85 mm Jack, Compression Mount, Edge Launch connector.

Instrument Setup & Test Accessories:

Network Analyzer	Keysight PNA N5227B
Averaging Factor	1
Smoothing	Off
IF Bandwidth	1 KHz
Sweep Start	10 MHz
Sweep End	67 GHz
Points	6700
Test Cables	Gore 0F0CACB036.0-LF(DC to 67 GHz)

Calibration Type:

A Keysight mechanical calibration is performed using the Keysight 85058B Standard Mechanical Calibration kit.

Calibration Kit	Keysight 85058B Standard Mechanical Calibration Kit

Adapter Use:

PCB-240MM-112613-SIG-0 RF board was used for the measurements of 185-J-P-EP-ST-EL-01.

Test System Description

The test fixture is composed of a four-layer MT40 material with 50Ω signal trace and varying launch designs to reflect performance on different routing layers. Optimization of the RF launch was performed using full wave simulation tools to minimize reflections. These launch designs were implemented on PCB-240MM-112613-SIG-0.

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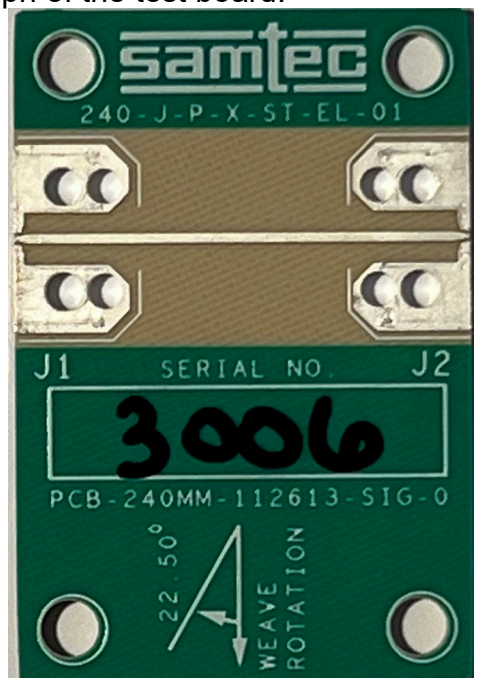
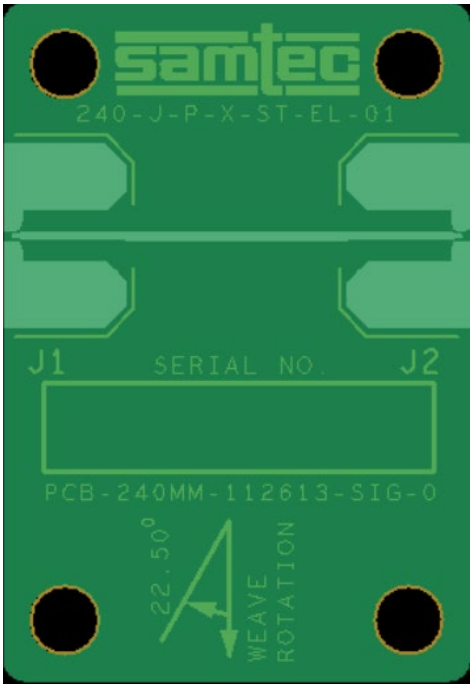
PCB-240MM-112613-SIG-0 Test Fixtures

Shown below is a photograph of the test board.



PCB-240MM-112613-SIG-0 PCB Layout

Artwork of the PCB design is shown below.



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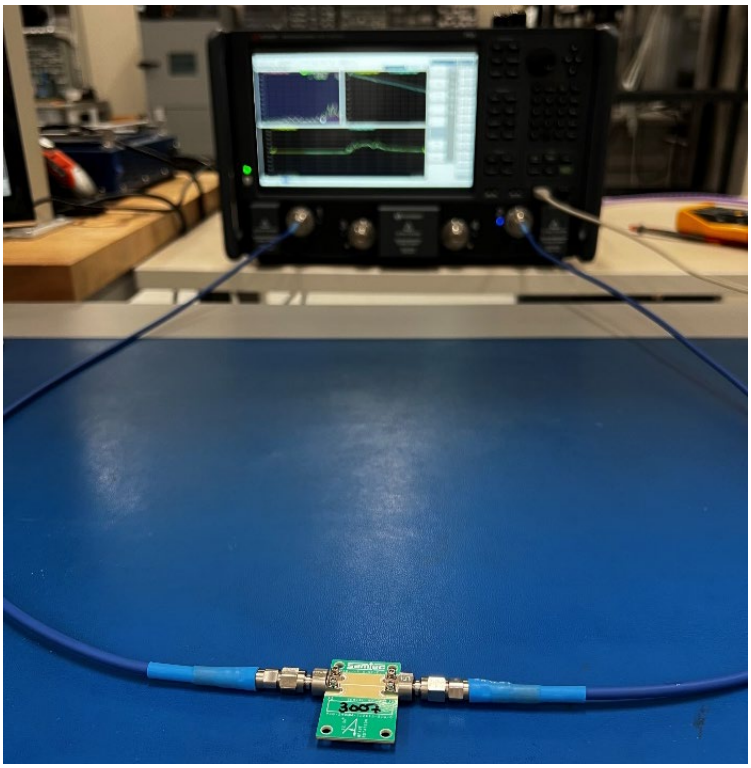
185-J-P-EP-ST-EL-01 Test Definition

Part Number	End 1
185-J-P-EP-ST-EL-01	1.85 mm

Connector Under Test:



Series: 185
Description: 50 Ohm 1.85 mm Jack, Compression Mount, Edge Launch

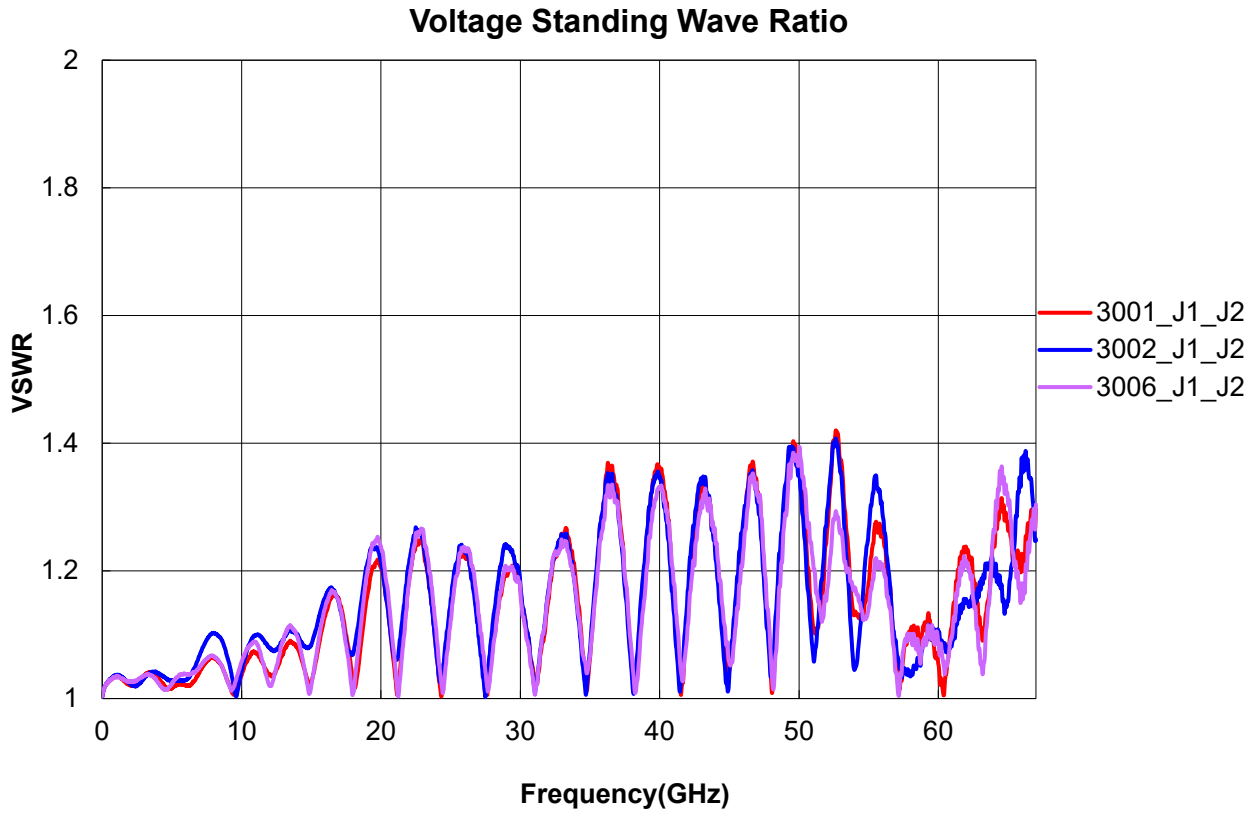
Results: 185-J-P-EP-ST-EL-01(2 connectors + 1 inch trace)

The following results include two 185-J-P-EP-ST-EL-01 connectors and 1 inch of PCB trace.

A straight microstrip topology identified 3 sensitivities with insertion loss. 46 GHz was sensitive to any gap between the connector and PCB which can be suppressed by minimizing and eliminating any gap when mounting to the PCB. 52 GHz and 58 GHz were sensitive to coupling of the microstrip trace to the 2.06mm and 1.90mm thru vias, which could be suppressed with GCPW structure fencing vias. No in-band suck outs exist in the connectors as verified by single ended connector measurements.

Description: 50 Ohm 1.85 mm Jack, Edge Launch			
Sample	**VSWR(max)**	**RL(max)**	**IL(min)**
3001_J1_J2	1.42@52.65GHz	-15.21@52.65GHz	-4.49@67.00GHz
3002_J1_J2	1.41@52.63GHz	-15.43@52.63GHz	-4.81@67.00GHz
3006_J1_J2	1.39@50.03GHz	-15.67@50.03GHz	-4.51@67.00GHz

VSWR



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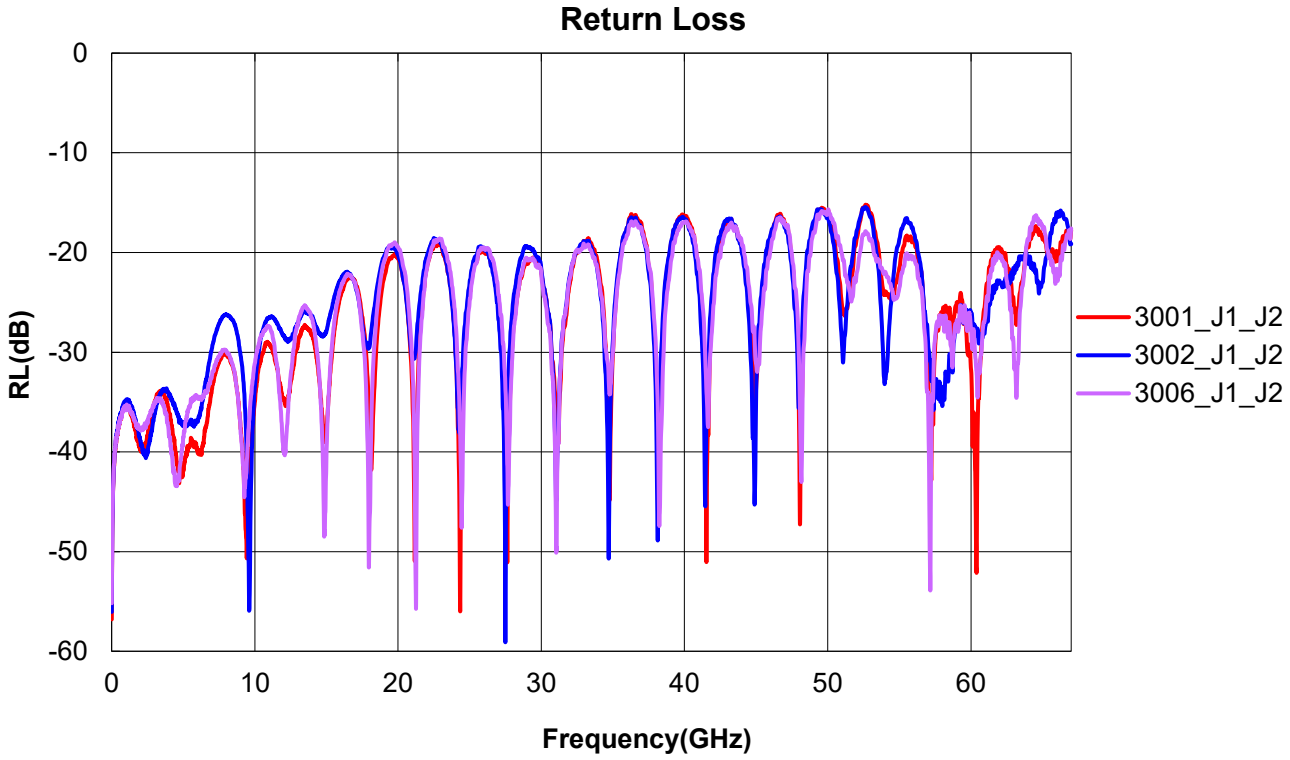
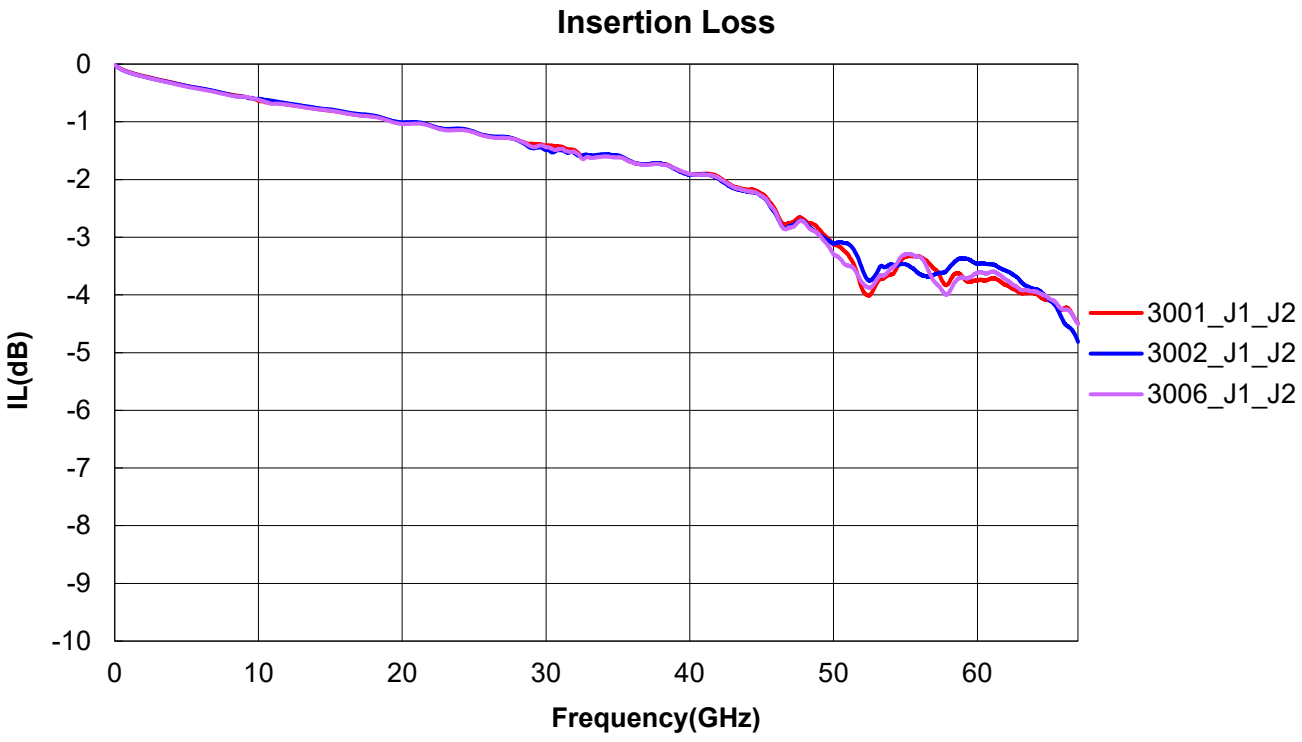
Return Loss



Insertion Loss



Series: 185
Description: 50 Ohm 1.85 mm Jack, Compression Mount, Edge Launch

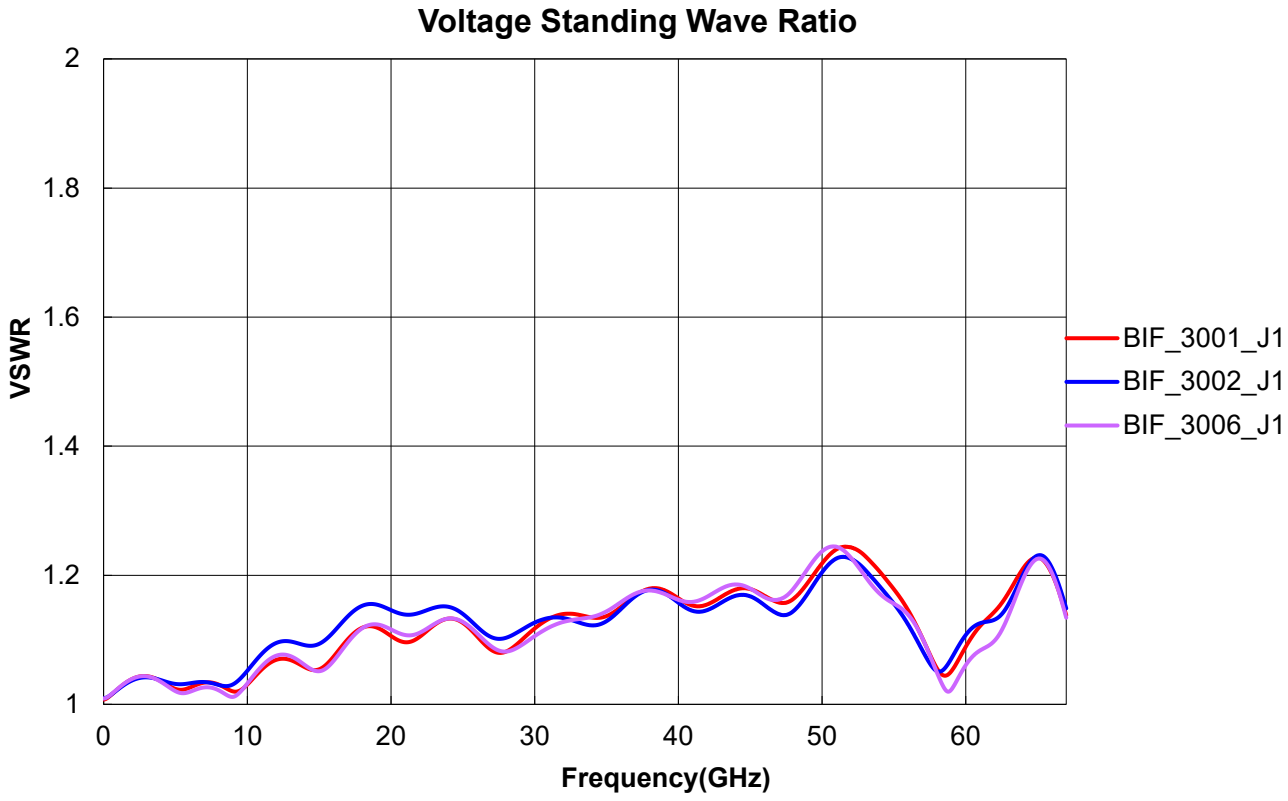
Results: 185-J-P-EP-ST-EL-01(1 connector + 500 mils trace)

The following results include one 185-J-P-EP-ST-EL-01 connector and 500 mils of PCB trace.

A straight microstrip topology identified 3 sensitivities with insertion loss. 46 GHz was sensitive to any gap between the connector and PCB which can be suppressed by minimizing and eliminating any gap when mounting to the PCB. 52 GHz and 58 GHz were sensitive to coupling of the microstrip trace to the 2.06mm and 1.90mm thru vias, which could be suppressed with GCPW structure fencing vias. No in-band suck outs exist in the connectors as verified by single ended connector measurements.

Description: 50 Ohm 1.85 mm Jack, Edge Launch			
Sample	**VSWR(max)**	**RL(max)**	**IL(min)**
BIF_3001_J1	1.24@51.59GHz	-19.26@51.59GHz	-2.19@66.94GHz
BIF_3002_J1	1.23@65.17GHz	-19.69@65.17GHz	-2.34@67.00GHz
BIF_3006_J1	1.24@50.76GHz	-19.25@50.76GHz	-2.19@66.95GHz

VSWR



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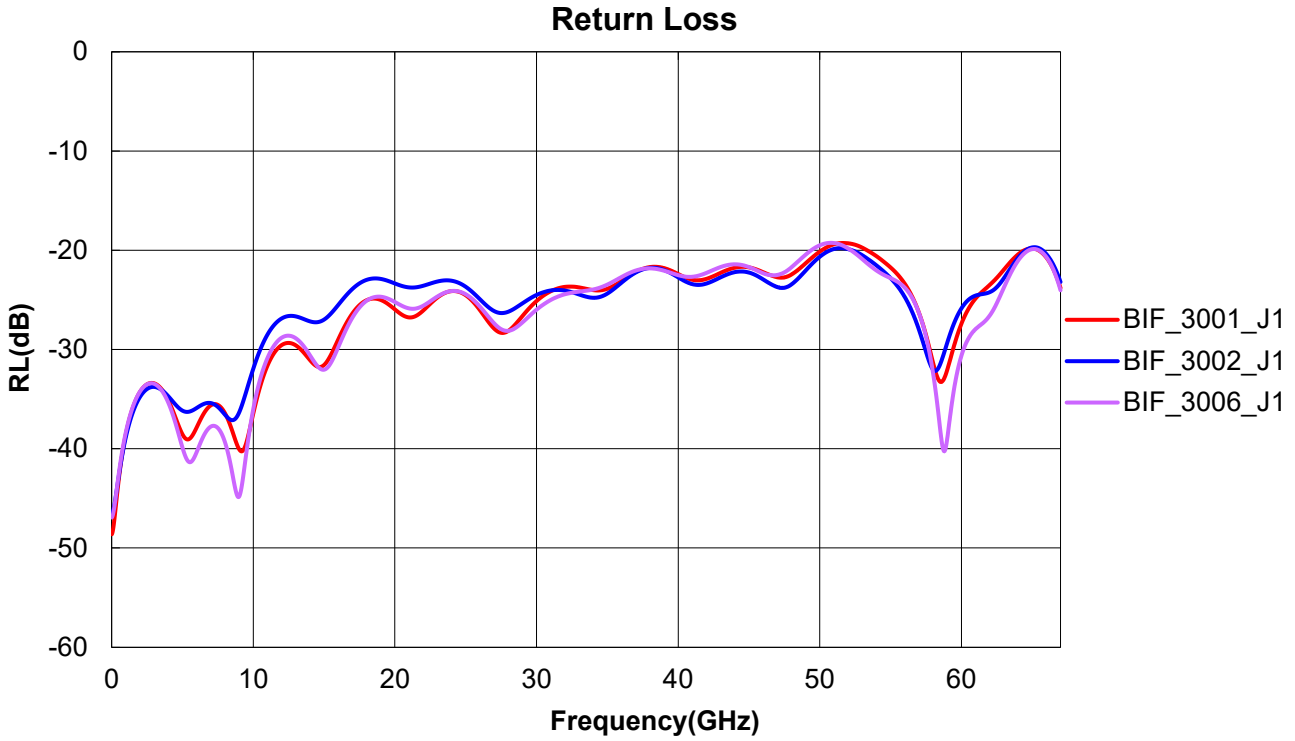
Return Loss



Insertion Loss