RF Characterization Report

RF23S Series Cable Assemblies

RF23S-35SJP-35SJP-0250

RF23S-35SPP-35SPP-0250

RF23S-35SJP-35SJP-1000

RF23S-35SPP-35SPP-1000

Description:
Microwave Cable Assembly, 3.5mm Connector End
23 AWG, 50 Ohm, Solid Dielectric

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Report Revision: 2/13/2018

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Test Setup Information

Scope

To perform characterization tests, Insertion Loss, Return Loss, TDR and Voltage Standing Wave Ratio (VSWR).

Product Description

The table below presents a description of the RF23S series cable assemblies that were tested.

Part Number	Length	Termination – End 1	Termination – End 2
RF23S-35SJP-35SJP-0250	250mm	SMA, 3.5mm Jack	SMA, 3.5mm Jack
RF23S-35SPP-35SPP-0250	250mm	SMA, 3.5mm Plug	SMA, 3.5mm Plug
RF23S-35SJP-35SJP-1000	1000mm	SMA, 3.5mm Jack	SMA, 3.5mm Jack
RF23S-35SPP-35SPP-1000	1000mm	SMA, 3.5mm Plug	SMA, 3.5mm Plug

Summary

Test Summary	RF23S-35SJP-35SJP-0250	RF23S-35SPP-35SPP-0250
Return Loss	>18.82 dB to 34GHz	>17.61 dB to 34GHz
Insertion Loss	<-1.24 dB to 34GHz	<-1.32 dB to 34GHz
Maximum Voltage Standing Wave Ratio	1.26 @26.31 GHz	1.3 @29.17 GHz
Maximum Impedance	50.82 Ohm @ 30ps	50.59 Ohm @ 30ps
Minimum Impedance	49.78 Ohm @ 30ps	49.72 Ohm @ 30ps

Test Summary	RF23S-35SJP-35SJP-1000	RF23S-35SPP-35SPP-1000
Return Loss	>19.77 dB to 34GHz	>18.76 dB to 34GHz
Insertion Loss	<-5.10 dB to 34GHz	<-5.68 dB to 34GHz
Maximum Voltage Standing Wave Ratio	1.23 @23.06 GHz	1.26 @27.58 GHz
Maximum Impedance	50.82 Ohm @ 30ps	50.51 Ohm @ 30ps
Minimum Impedance	49.85 Ohm @ 30ps	49.73 Ohm @ 30ps

Cable Series: RF23S
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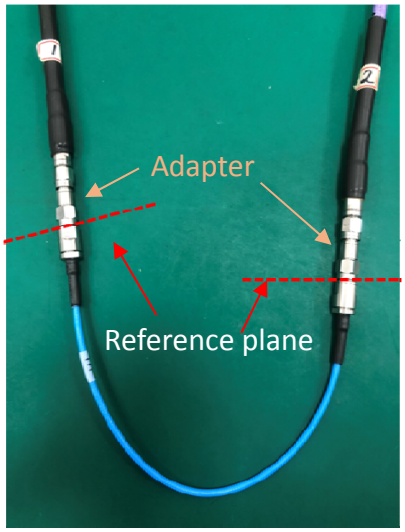
Test Calibration

The Calibration was performed under SOLT in the measurements



(Sample setup of adapters, actual setup not depicted.)

Adapter Use

Each port uses at least one precision adapter capable of mating to the assembly under test. Any supplementary adapter will contribute additional electrical characteristics to the measured data. Utilizes Pasternack Enterprises's and Fairview Microwave's RF type adapters PE9651 and SM3175 at each test port.

Definition of Assembly under Test

Performance characteristics include effects of the whole cable assembly

Port Designations

The connector attached to port 1 of the VNA is "End 1" from the part number callout. Insertion Loss is measured using S21 and Return Loss / VSWR is measured using S11 and S22.

Legend for Plots

12 samples were tested. Base on the insertion loss, plots are shown for clarity in this report.

Cable Series: RF23S
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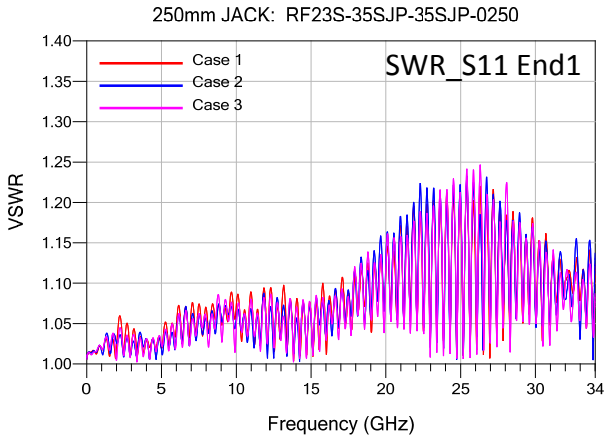
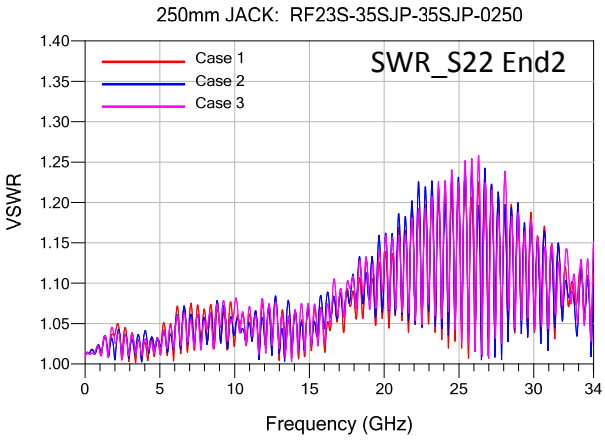
Results

RF23S-35SJP-35SJP-0250

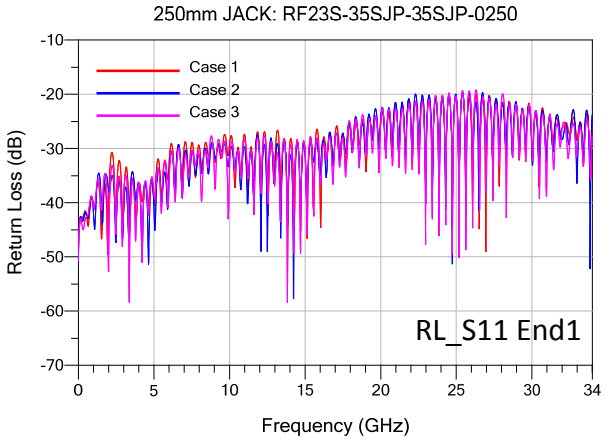
Description: 3.5mm Jack to RF23S Microwave Cable 3.5mm Jack			
	10 MHz to 34.0 GHz		
DUT	**SWR (max)**	**RL (max)**	**IL (min)**
1 (S11, S21)	1.23 @ 25.41 GHz	-19.77 @ 25.41 GHz	-1.20 @ 30.72 GHz
(S22, S12)	1.23 @ 25.40 GHz	-19.66 @ 25.40 GHz	-1.20 @ 30.72 GHz
2 (S11, S21)	1.23 @ 25.41 GHz	-19.63 @ 25.41 GHz	-1.23 @ 31.62 GHz
(S22, S12)	1.24 @ 25.41 GHz	-19.34 @ 25.41 GHz	-1.24 @ 31.62 GHz
3 (S11, S21)	1.25 @ 26.31 GHz	-19.18 @ 26.31 GHz	-1.21 @ 31.17 GHz
(S22, S12)	1.26 @ 26.31 GHz	-18.82 @ 26.31 GHz	-1.22 @ 31.17 GHz

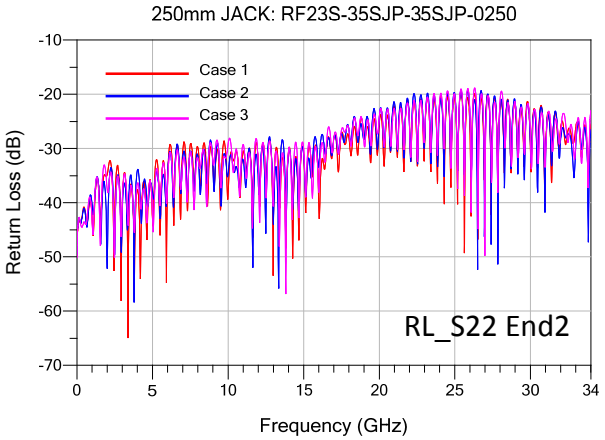
Standing Wave Ratio





Return Loss





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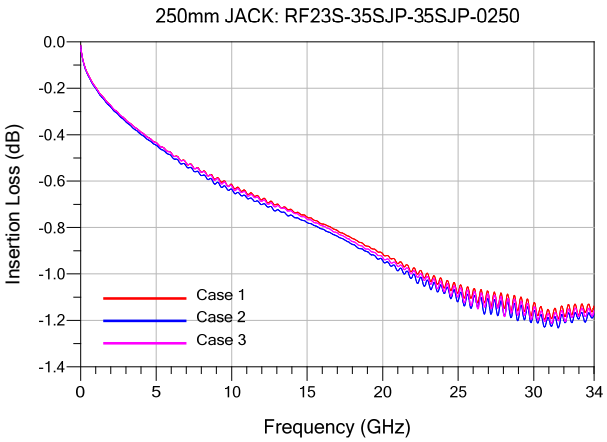
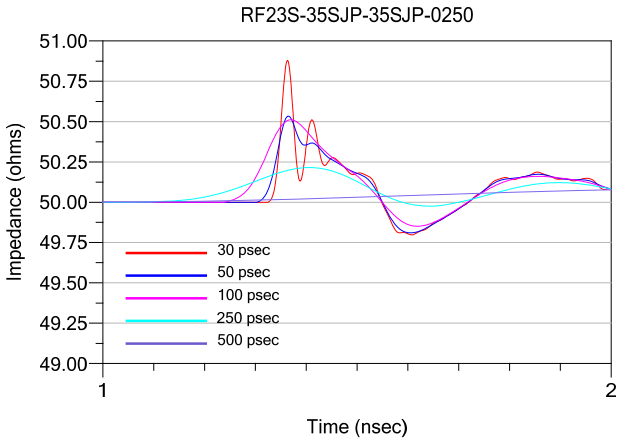
Insertion Loss / TDR



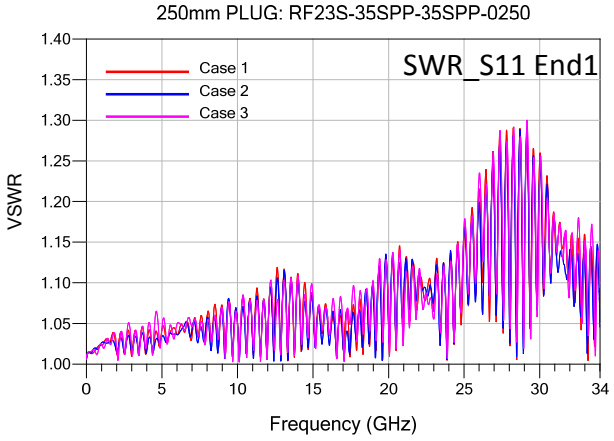


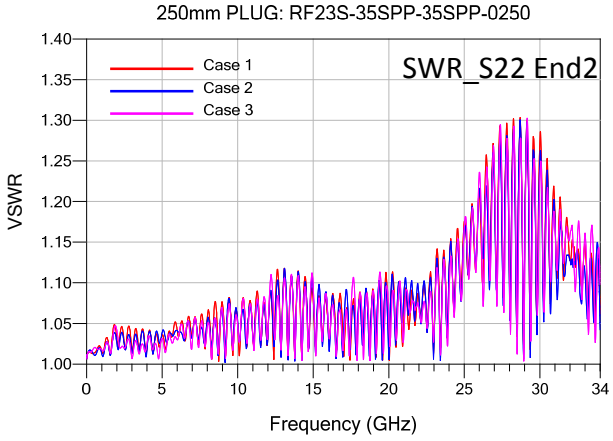
Cable Series: RF23S
Description: Microwave Cable Assembly, 3.5mm Connector Ends, 23 AWG, 50 Ohm, Solid Dielectric

RF23S-35SPP-35SPP-0250

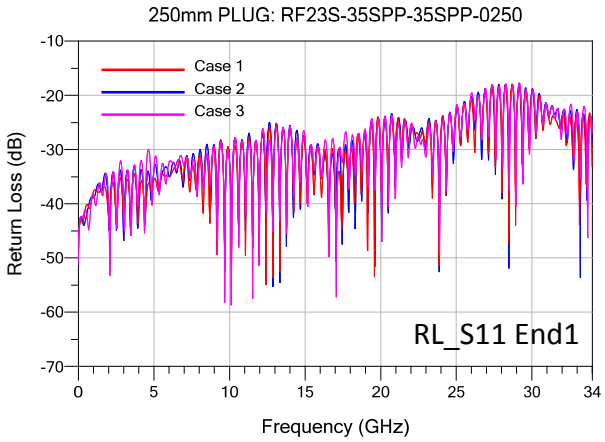
Description: 3.5mm Plug to RF23S Microwave Cable to 3.5mm Plug			
	10 MHz to 34.0 GHz		
DUT	**SWR (max)**	**RL (max)**	**IL (min)**
1 (S11, S21)	1.29 @ 28.26 GHz	-17.92 @ 28.26 GHz	-1.28 @ 33.91 GHz
(S22, S12)	1.30 @ 28.71 GHz	-17.61 @ 28.71 GHz	-1.28 @ 33.91 GHz
2 (S11, S21)	1.29 @ 29.15 GHz	-17.90 @ 29.15 GHz	-1.29 @ 33.85 GHz
(S22, S12)	1.30 @ 28.70 GHz	-17.67 @ 28.70 GHz	-1.29 @ 33.85 GHz
3 (S11, S21)	1.30 @ 29.17 GHz	-17.68 @ 29.17 GHz	-1.33 @ 33.91 GHz
(S22, S12)	1.30 @ 29.17 GHz	-17.62 @ 29.17 GHz	-1.32 @ 33.91 GHz

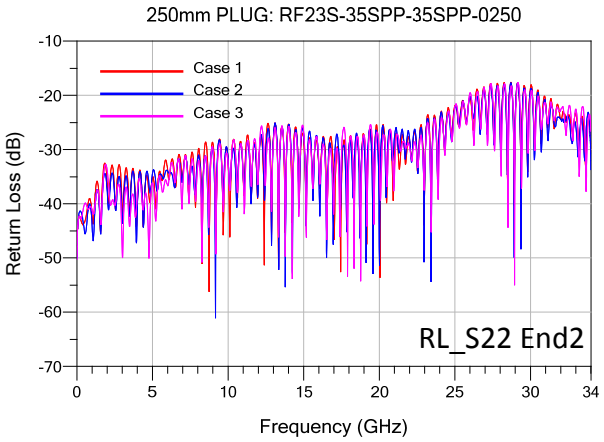
Standing Wave Ratio





Return Loss





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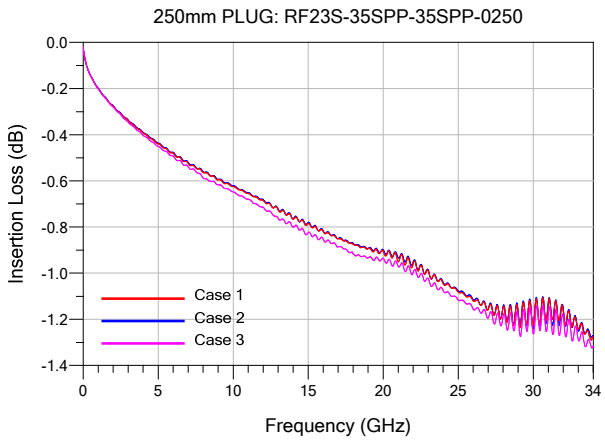
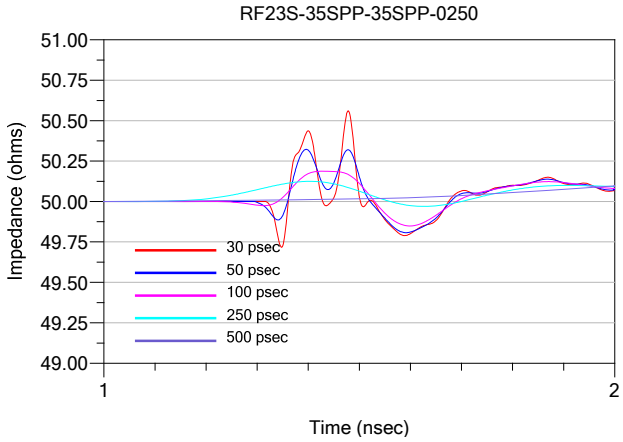
Insertion Loss / TDR





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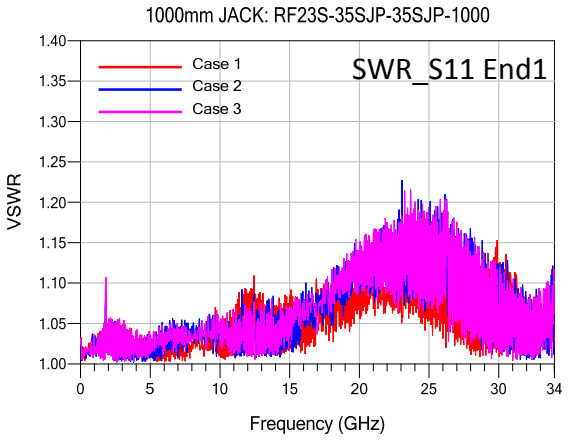
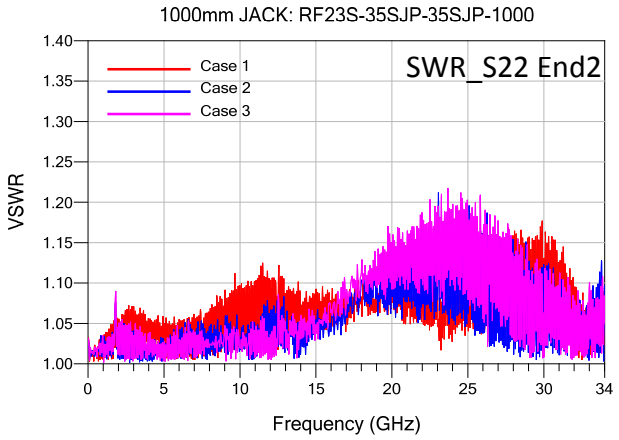
Description: Microwave Cable Assembly, 3.5mm Connector Ends, 23 AWG, 50 Ohm, Solid Dielectric

RF23S-35SJP-35SJP-1000

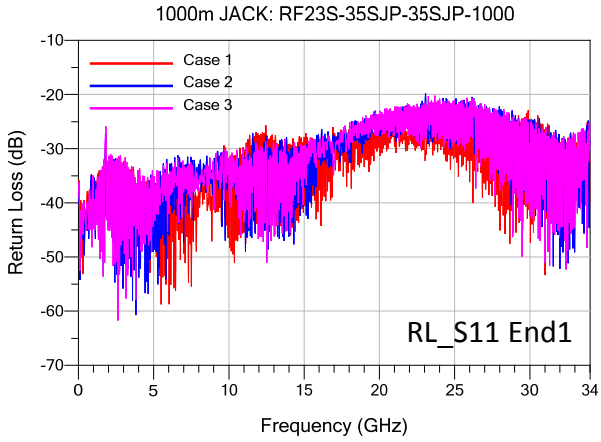
Description: 3.5mm Jack to RF23S Microwave Cable to 3.5mm Jack			
	10 MHz to 34.0 GHz		
DUT	**SWR (max)**	**RL (max)**	**IL (min)**
1 (S11, S21)	1.15 @ 29.89 GHz	-22.95 @ 29.89 GHz	-4.94 @ 33.96 GHz
(S22, S12)	1.18 @ 29.89 GHz	-21.78 @ 29.89 GHz	-4.95 @ 33.96 GHz
2 (S11, S21)	1.23 @ 23.06 GHz	-19.77 @ 23.06 GHz	-4.82 @ 33.95 GHz
(S22, S12)	1.21 @ 23.06 GHz	-20.28 @ 23.06 GHz	-4.82 @ 33.95 GHz
3 (S11, S21)	1.22 @ 23.68 GHz	-20.15 @ 23.68 GHz	-5.09 @ 33.82 GHz
(S22, S12)	1.22 @ 23.68 GHz	-20.08 @ 23.68 GHz	-5.10 @ 33.82 GHz

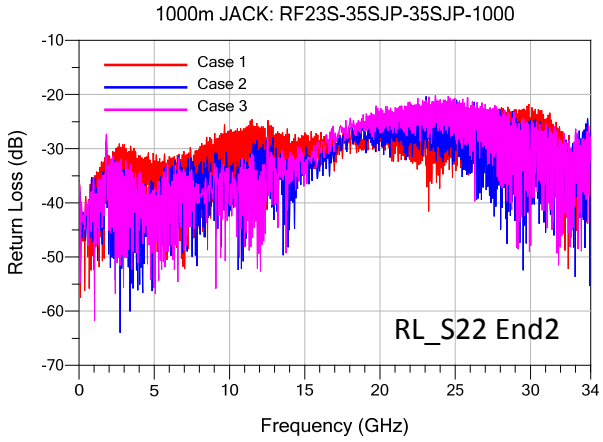
Standing Wave Ratio





Return Loss





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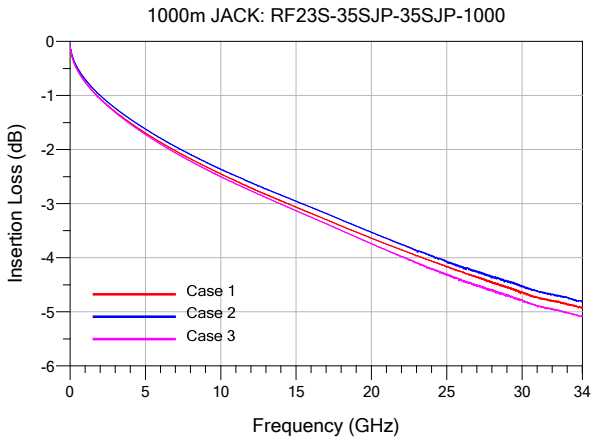
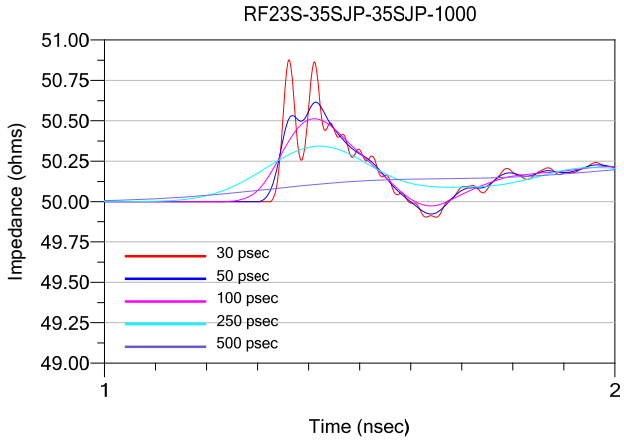
Insertion Loss / TDR





Cable Series: RF23S
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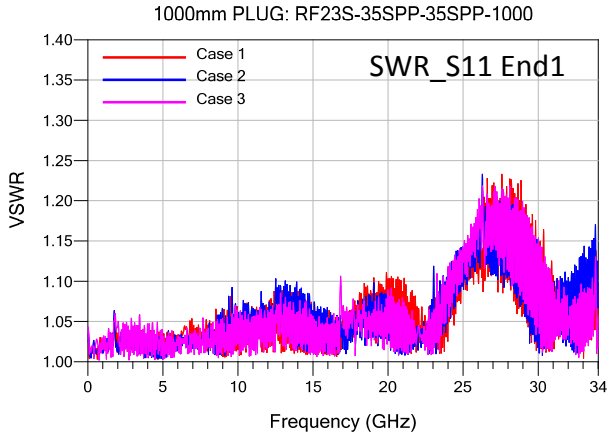
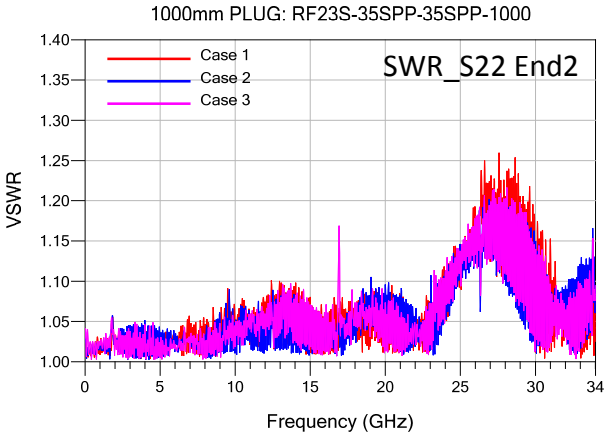
RF23S-35SPP-35SPP-1000

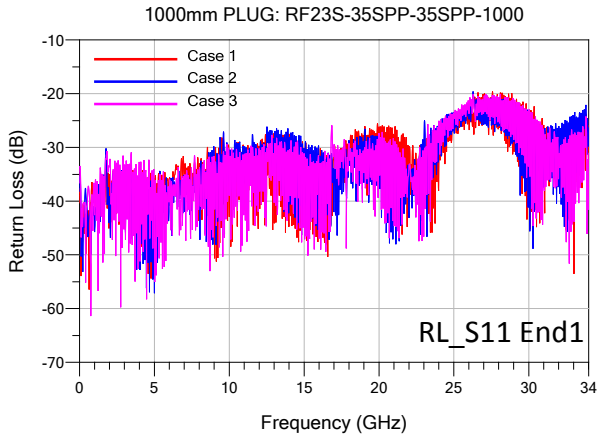
Description: 3.5mm Plug to RF23S Microwave Cable to 3.5mm Plug			
	10 MHz to 34.0 GHz		
DUT	**SWR (max)**	**RL (max)**	**IL (min)**
1 (S11, S21)	1.23 @ 27.58 GHz	-19.58 @ 27.58 GHz	-4.83 @ 32.07 GHz
(S22, S12)	1.26 @ 27.58 GHz	-18.76 @ 27.58 GHz	-4.84 @ 33.84 GHz
2 (S11, S21)	1.23 @ 26.28 GHz	-19.61 @ 26.88 GHz	-5.19 @ 33.82 GHz
(S22, S12)	1.20 @ 27.88 GHz	-20.68 @ 27.88 GHz	-5.17 @ 33.82 GHz
3 (S11, S21)	1.22 @ 28.10 GHz	-20.05 @ 28.10 GHz	-5.68 @ 33.84 GHz
(S22, S12)	1.22 @ 28.10 GHz	-20.15 @ 28.10 GHz	-5.68 @ 33.84 GHz

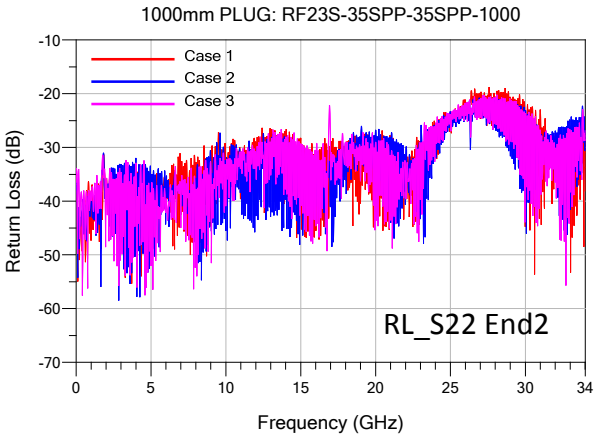
Standing Wave Ratio





Return Loss





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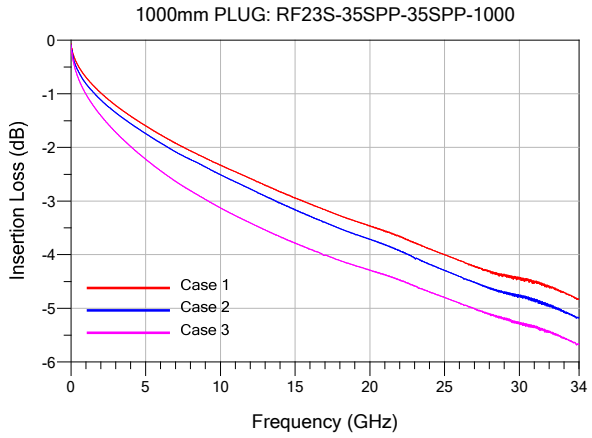
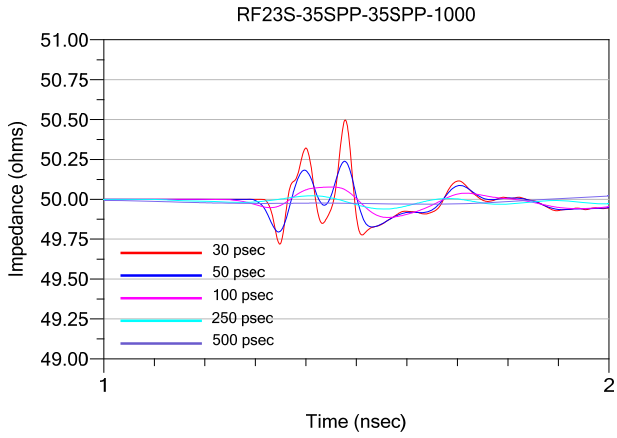
Insertion Loss / TDR





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Instrument Setup

Network analyzer (Keysight N5227A) was used for the measurements and setup as below:

Network Analyzer	Keysight N5227A PNA-L Series (10 MHZ - 67 GHz)
Mechanical Calibration Kit	Maury Microwave 8770CK Economy Cal Kit
Averaging Factor	1
Smoothing	Off
IF Bandwidth	1 kHz
Sweep Start	10 MHz
Sweep End	34 GHz
Points	3400

Test Instrument

N5227A (Typical set-up, actual part not depicted.)