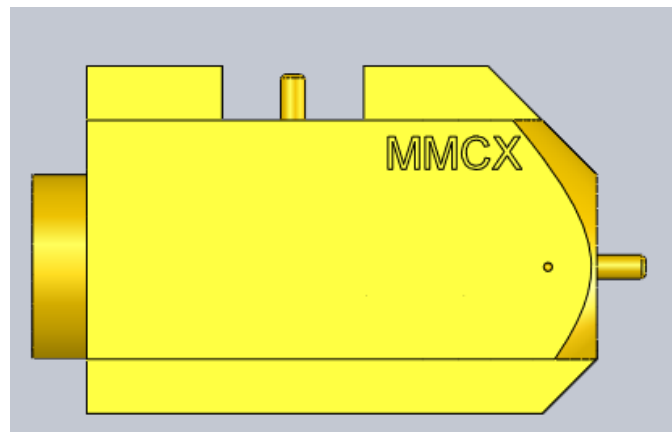




RF Characterization Report

MMCX Switch

MMCX-J-P-X-SW-EM1



Description:
MMCX Switch Edge-Card Receptacle for SMT

Series: MMCX

Description: MMCX Switch Edge-Card Receptacle for SMT

Table of Contents

Test Setup Information.....	1
Scope:	1
Product Description:	1
Test Calibration:.....	1
Adapter Use:.....	3
Definition of Assembly under Test:	3
Port Designations:	3
Legend for Plots:.....	3
Results Summary.....	4
MMCX-J-P-X-SW-EM1, MMCX Jack to PIN 2	4
MMCX-J-P-X-SW-EM1, PIN 2 to PIN 3	5
Instrument Setup:.....	6
Test Fixtures:	6

Series: MMCX

Description: MMCX Switch Edge-Card Receptacle for SMT

Test Setup Information

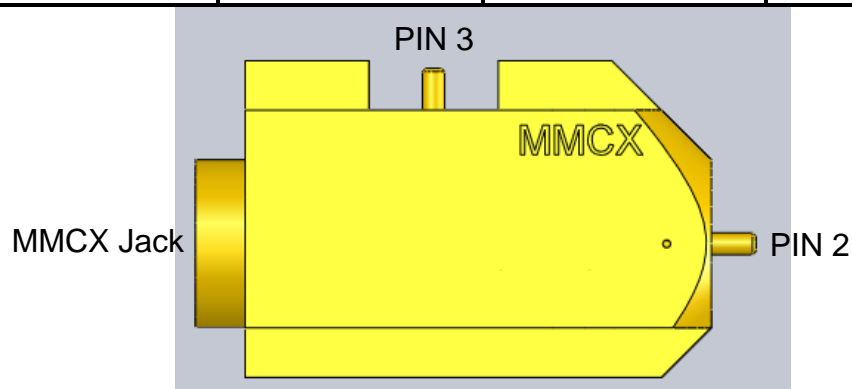
Scope:

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

Product Description:

The table below presents a description of the MMCX switch that was tested.

Part Number	Termination – End 1	Termination – End 2	Termination – End 3
MMCX-J-P-X-SW-EM1	MMCX, Straight, Jack	PIN 2	PIN 3

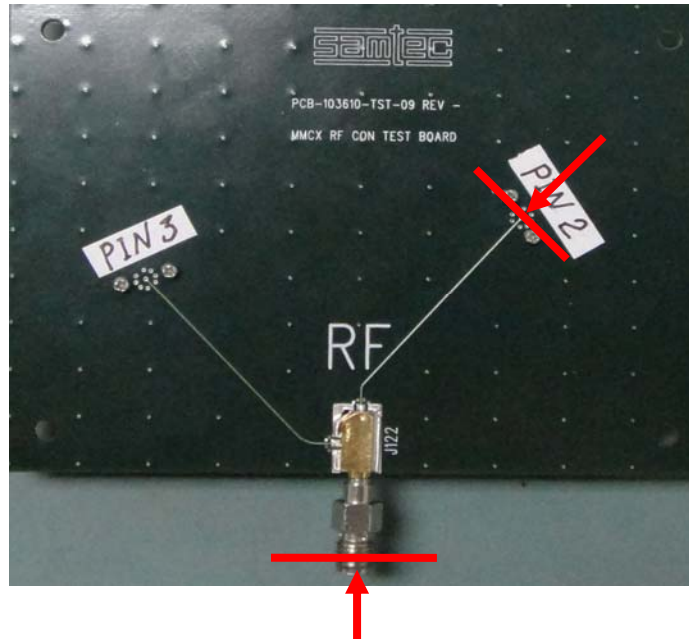


Test Calibration:

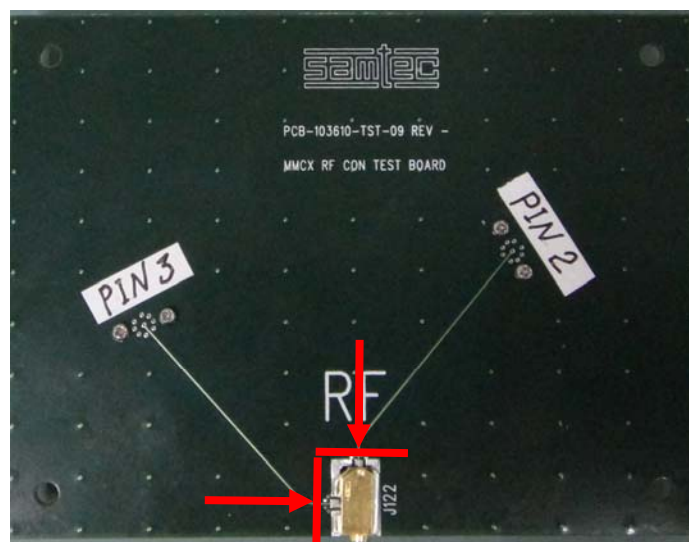
In this report, the system under test (SUT) includes the MMCX switch and footprint effects on a typical multi-layer PCB. Some PCB effects (i.e. trace loss) were de-embedded from the resultant test data. Other board related effects, such as pad-to-ground capacitance, are included in the data presented in this report.

Additionally, because intermediate test signal connections can mask the true performance of the connectors, high performance test cables and adapters were used to minimize the connection effects. Where appropriate, calibration and de-embedding routines were also used to reduce residual effects.

For the MMCX Jack to Pin 2 path, a calibration was performed using the Agilent mechanical calibration kit, PN 85052D, to shift the reference plane as shown below. The SMA Jack to MMCX Plug adapter beyond this point in the overall path is included in the measurement. The trace loss from SMA to MMCX has been de-embedded from the test data by using Matlab to post-process the measured data.

Series: MMCX**Description:** MMCX Switch Edge-Card Receptacle for SMT

For the Pin 2 to Pin 3 path, a TRL calibration (PN PCB-103610-TST-08) was performed to shift the reference plane as shown below. TRL calibration is efficient at removing the effects of the PCB test fixture and providing a more accurate depiction of the MMCX switch. This approach does rely on the use of on-board calibration standards, which by nature, are imperfect. Reason being, mainstream PCB manufacturing can only maintain a trace impedance of +/- 5% and this variation has a slight effect on the MMCX switch test results. At 800 MHz there is a step in the return loss profile that is due to the impedance variation of the TRL calibration standards. This effect only shows up at the calibration standard transition frequencies and only for high values of return loss (>20 dB).



Series: MMCX

Description: MMCX Switch Edge-Card Receptacle for SMT

Adapter Use:

Any supplementary adapter will contribute additional electrical characteristics to the measured data. Any use of additional adapters is noted.

Product Part Number	Used Adapter Part Number	Adapter End 1	Adapter End 2	Vender	Used Quantity
MMCX-J-P-X-SW-EM1	PE9475	SMA Jack	MMCX Plug	Pasternack	1

Definition of Assembly under Test:

The performance characteristics include the interface with adapters.

Port Designations:

The connector attached to port 1 of the VNA is "End 1" from the part number callout. Insertion loss is represented by S21 and Return Loss/VSWR, S11.

Legend for Plots:

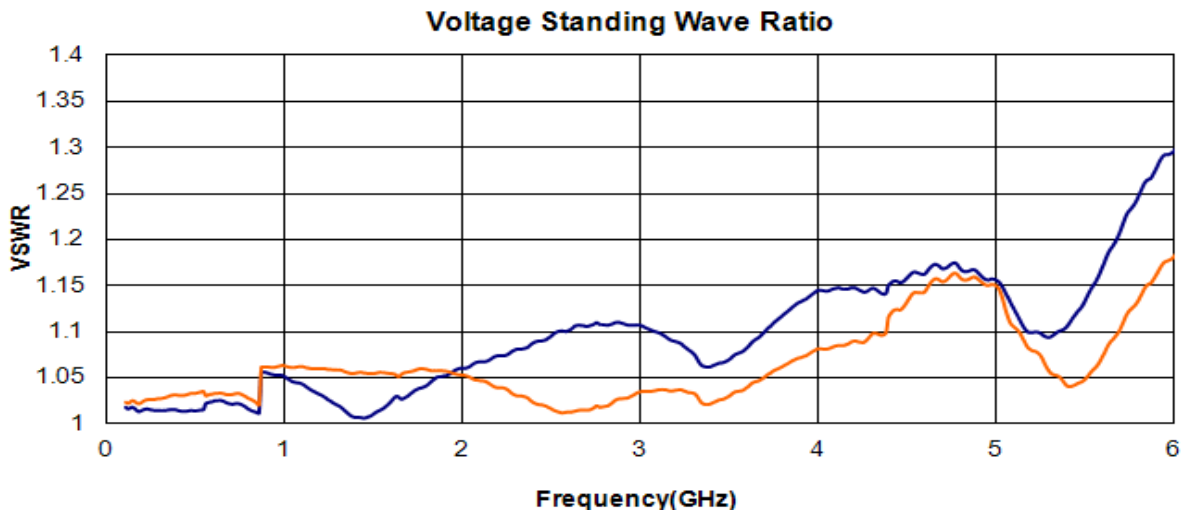
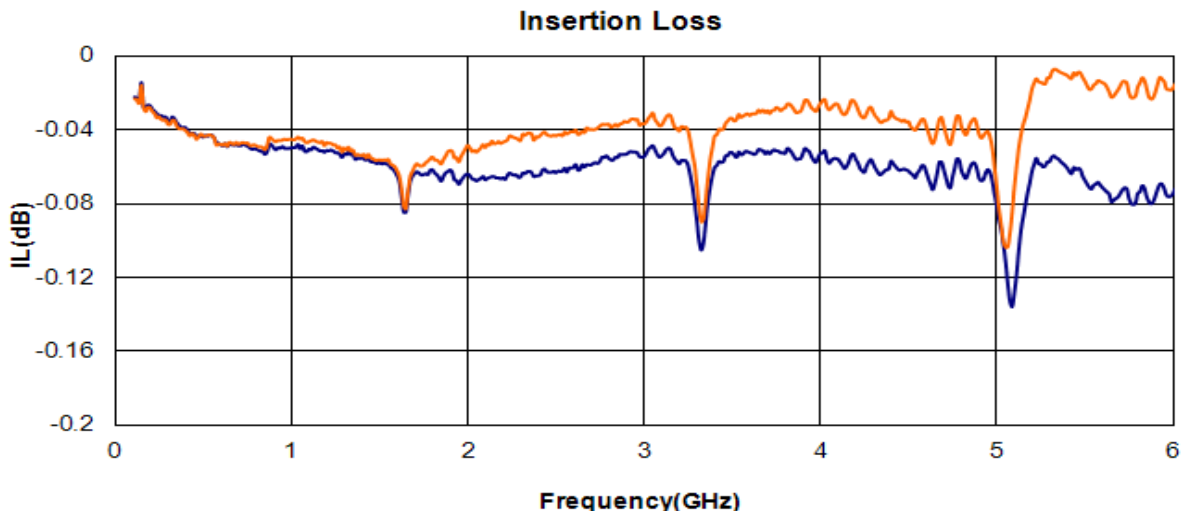
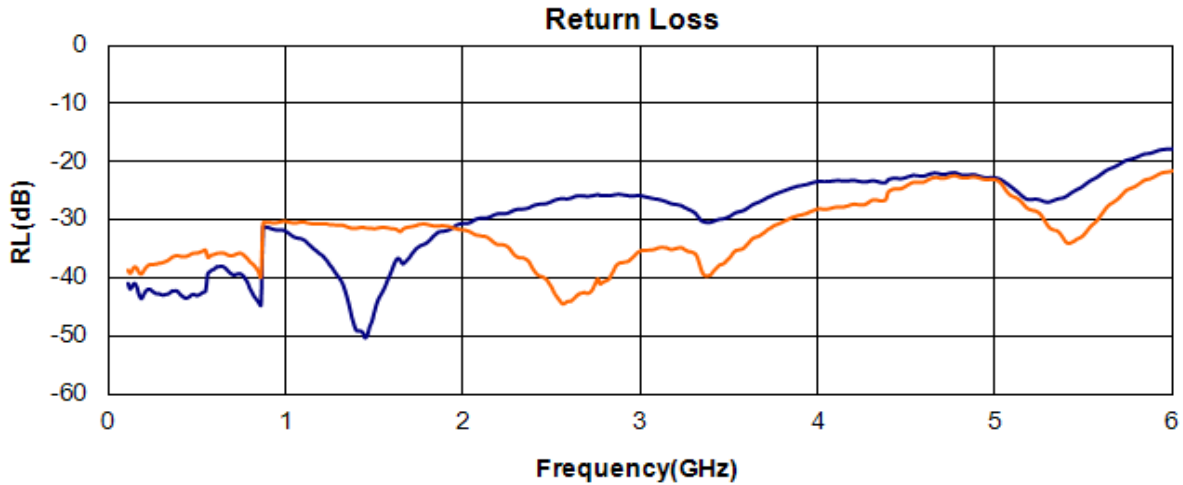
Five samples were tested. Based on the insertion loss, the min/max plots are shown for clarity in this report.

Series: MMCX

Description: MMCX Switch Edge-Card Receptacle for SMT

Results Summary:

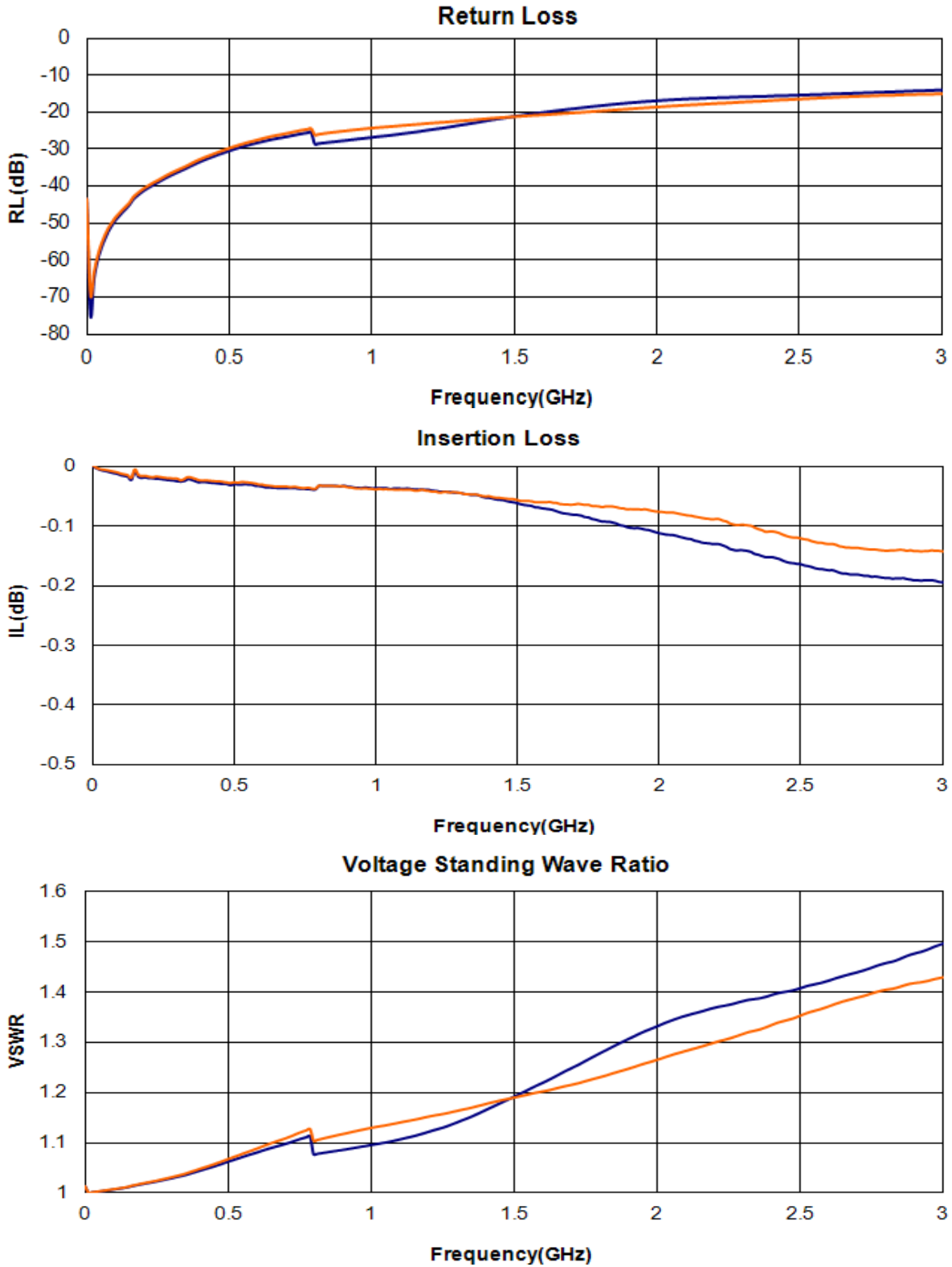
MMCX-J-P-X-SW-EM1, MMCX Jack to PIN 2



Series: MMCX

Description: MMCX Switch Edge-Card Receptacle for SMT

MMCX-J-P-X-SW-EM1, PIN 2 to PIN 3



Series: MMCX

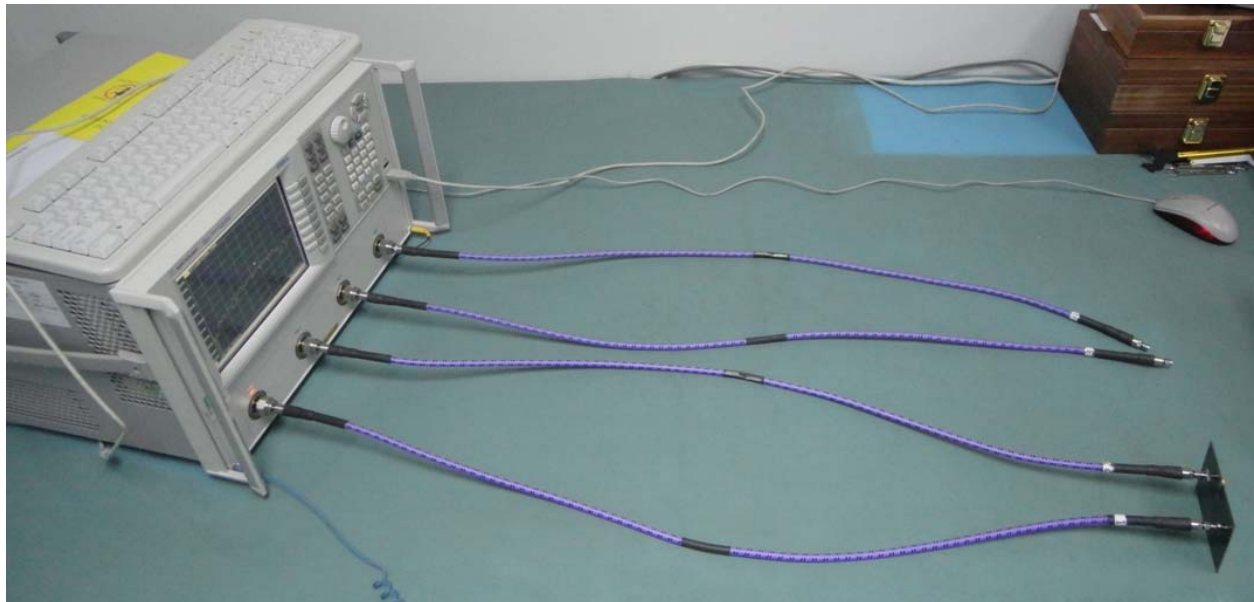
Description: MMCX Switch Edge-Card Receptacle for SMT

Instrument Setup:

An Agilent N5230C network analyzer was used for the measurements in this report and setup as below:

Network Analyzer	Agilent N5230C PNA-L Series (300 KHz - 20 GHz)
Mechanical Calibration Kit	85052D
TRL Calibration Kit	PCB-103610-TST-08
Averaging Factor	0
Smoothing	Off
IF Bandwidth	1 KHz
Sweep Start	300 KHz
Sweep End	20 GHz
Points	1601

Test Fixtures:



N5230C (Typical set-up)