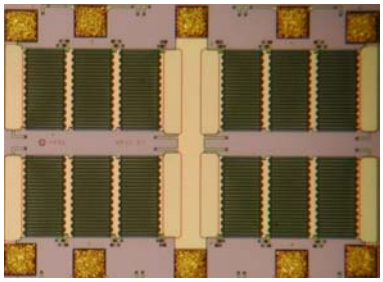
SP4T Reflective pHEMT MMIC Switch

Description



The FMS2003 is a linear high power Single-Pole Four-Throw MMIC Antenna Switch designed for use in Dual-band handsets GSM900 and GSM1800/1900 combinations. The switch is designed with one antenna port that can be routed to any one of the four RF ports.

Features

- Low insertion loss (0.5 dB @ 900 MHz)
- Operation down to 2V
- 4 control lines. Single positive voltage supply
- Low harmonics (Typical -67dBc at Pin=+34.5dBm)
- High Isolation (30 dB @ 900 MHz)
- Filtronic Advanced GaAs pHEMT Technology

Electrical Characteristics (at 25C°, [V_{ctrl} 0,+2.7V], 50 Ohm system, under CW)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Insertion Loss	IL	1		0.5		dB
		2		0.6		dB
		3		0.6		dB
Isolation – Ant on.	ISO	1		35		dB
		2		26		dB
S11	S11	1		-25		dB
S11	S11	2		-25		dB
Harmonics	2fo	3		-78		dBc
	3fo	3		-72		dBc
Leakage Current - Tx	I_{lkTx}	3		3.2		µA
Leakage Current – Rx	I_{lkRx}	3		3.4		µA

Condition

1 Small signal, DC – 1GHz, Vctrl = 2.7V/0V
2 Small signal, 1-2 GHz, Vctrl = 2.7V/0V
3 Input power=34.5dBm, EGSM Tx 880-915MHz, Vctrl=2.7V/0V

GaAs MMIC's are ESD sensitive devices. Special handling precautions are required.

Truth Table

Operation	Control Voltage			
	Vctrl 1	Vctrl 2	Vctrl 3	Vctrl 4
RF1-Ant	High	Low	Low	Low
RF2-Ant	Low	High	Low	Low
RF3-Ant	Low	Low	High	Low
RF4-Ant	Low	Low	Low	High

Control values

Control	Min	Typ.	Max	Unit
High		2.7		V
Low		0.0		V

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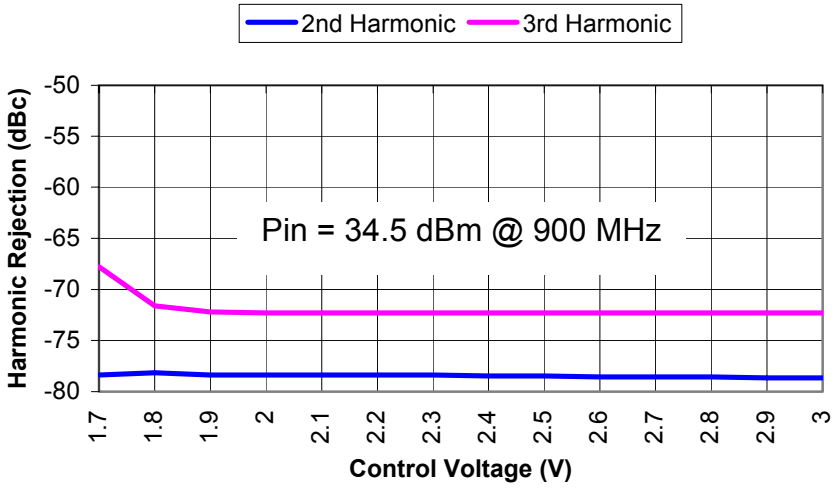
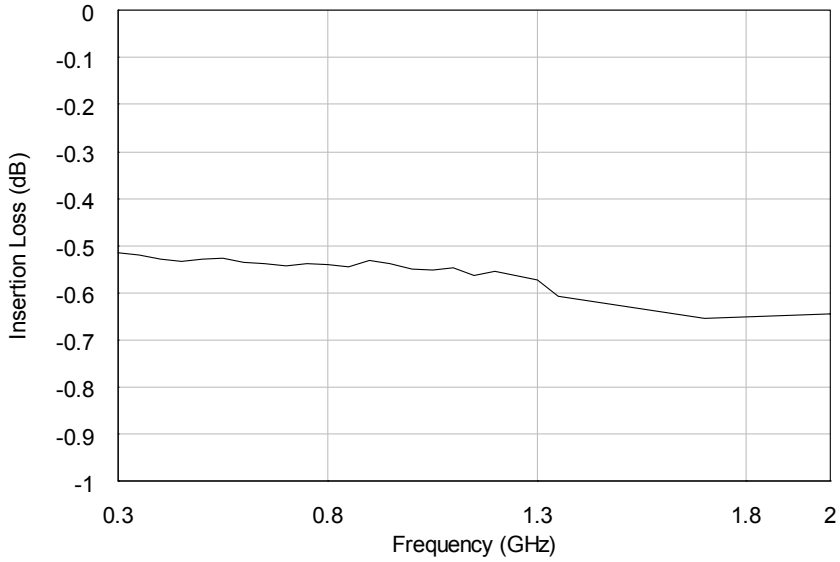
Typical Jig Measurements

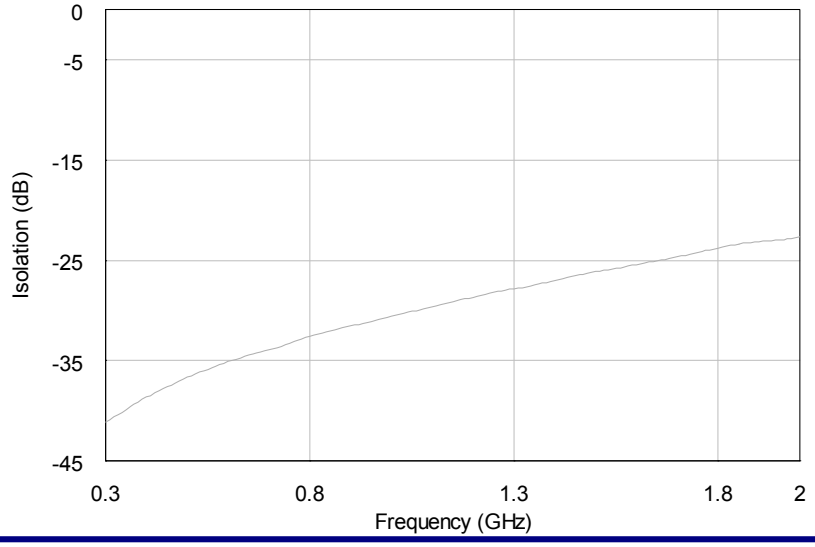
Harmonic Rejection vs. Control Voltage



Insertion Loss vs. Frequency



Isolation vs. Frequency



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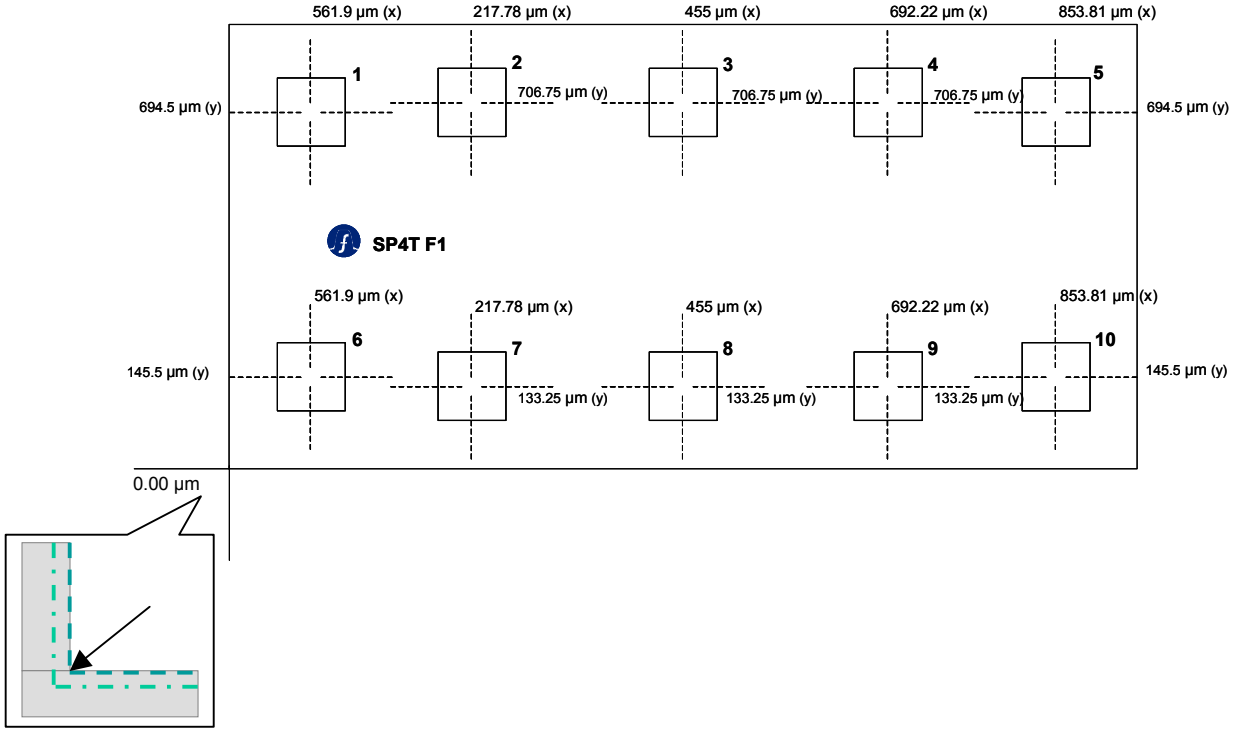
SP4T Bonding Configuration

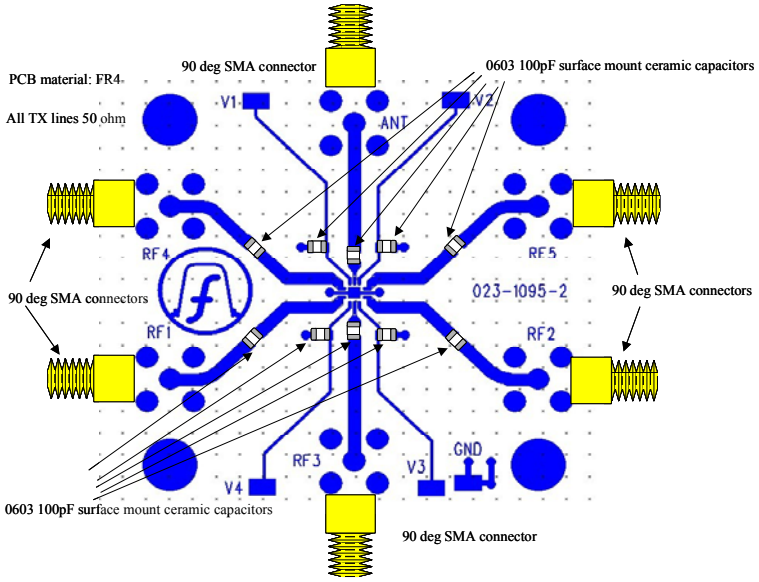
Pad Number	Port	Symbol	Connection on Board
1	RF input port 1	RF 1	RF4
2	DC Control line 1	Vctrl 1	V1
3	Antenna*	ANT	ANT
4	DC Control line 3	Vctrl 3	V2
5	RF input port 3	RF 3	RF5
6	RF input port 2	RF 2	RF1
7	DC Control line 2	Vctrl 2	V4
8	Antenna*	ANT	RF3*
9	DC Control line 4	Vctrl 4	V3
10	RF input port 4	RF 4	RF2

* Either or both of the antenna pads can be bonded. They are electrically the same.

Bonding Pad Layout



Suggested Application Board Layout



Generic SPDT, 3T and 4T Evaluation Board Layout