



# GaAs SP4T Switch, Absorptive, Single Supply, DC - 4 GHz

V 3.00

SW90-0003

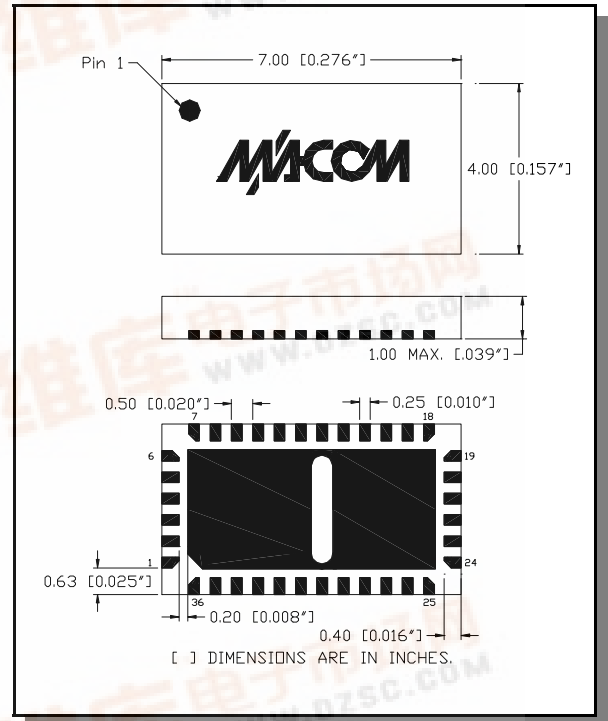
## Features

- Operates DC - 4 GHz on Single Supply
- ASIC TTL / CMOS Driver
- Leadless 4 x 7 mm Chip Scale Plastic Package
- Low DC Power Consumption
- 50 Ohm Nominal Impedance
- Test Boards are Available
- Tape and Reel are Available

## Description

M/A-COM's SW90-0003 is a SP4T absorptive pHEMT switch with integral TTL driver. This device is in an MLP plastic surface mount package. This switch offers excellent broadband performance and repeatability from DC to 4 GHz, while maintaining low DC power dissipation. The SW90-0003 is ideally suited for wireless infrastructure applications.

## CSP-2



## Electrical Specifications: $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Frequency	Units	Min.	Typ.	Max.
Insertion Loss	RFC-RF1, 2, 3, 4	DC - 4.0 GHz	dB	—	—	2.3
Isolation	—	DC - 4.0 GHz	dB	38	—	—
VSWR	On (RFC, RF1-RF4) Logic per Truth Table	DC - 4.0 GHz	Ratio	—	—	2.0:1
	Off (RF1-RF4) Logic per Truth Table	DC - 4.0 GHz	Ratio	—	—	2.0:1
1 dB Compression	—	50 MHz	dBm	—	+15	—
	—	0.5 - 4.0 GHz	dBm	—	+27	—
Input $IP_3$	Two-tone inputs up to +5 dBm	50 MHz	dBm	—	30	—
		0.5-4.0 GHz	dBm	—	40	—
Switching Speed	Ton (50% Control to 10% RF)		nS	—	35	—
	Toff (50% Control to 90% RF)		nS	—	20	—
	Trise (10% to 90% RF)		nS	—	12	—
	Tfall (90% to 10% RF)		nS	—	2	—
Vcc	—	—	V	4.5	5.0	5.5
Logic "0"	Sink Current is 20 $\mu\text{A}$ max.	—	V	0.0	—	0.8
Logic "1"	Source Current is 20 $\mu\text{A}$ max.	—	V	2.0	—	5.0
Icc	Vcc min to max, Logic "0" or "1"	—	mA	—	5	8

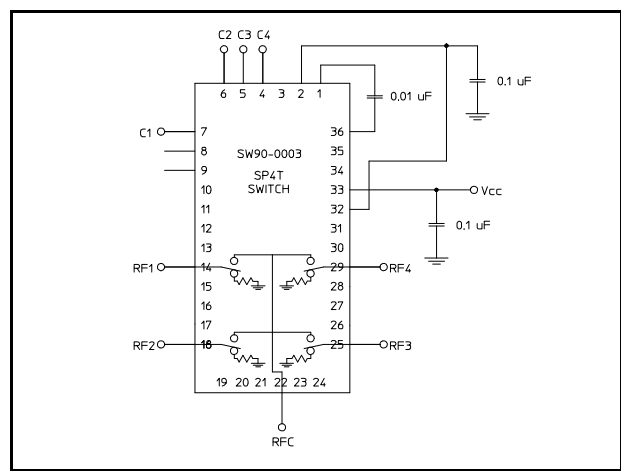


Pin Configuration <sup>1,2,3</sup>

Pin No.	Function	Pin No.	Function
1	CP2	19	GND
2	Vee	20	NC
3	NC	21	GND
4	C4	22	RFC
5	C3	23	GND
6	C2	24	NC
7	C1	25	RF3
8	NC	26	GND
9	NC	27	NC
10	NC	28	GND
11	NC	29	RF4
12	NC	30	GND
13	GND	31	NC
14	RF1	32	Vee
15	GND	33	Vcc
16	NC	34	NC
17	GND	35	NC
18	RF2	36	CP1

1. NC = No Connection
2. VEE is internally generated and must remain isolated from external power supplies.
3. Connections and external components shown in functional schematic are required. 0.1 $\mu$ F Capacitors need to be located near pins 32 & 33.

## Functional Schematic

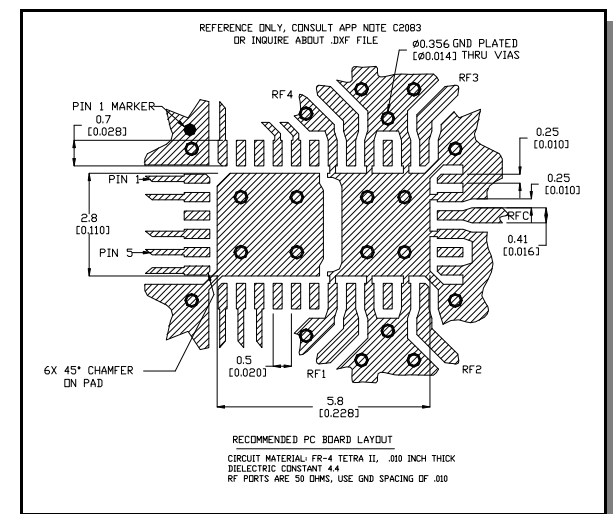
Absolute Maximum Ratings <sup>4,5</sup>

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 4.0 GHz	+27 dBm +34 dBm
Bias Voltages V <sub>CC</sub> Control Voltage <sup>6</sup>	+5.5V -0.5V to V <sub>CC</sub> +0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

4. Operation of this device above any one of these parameters may cause permanent damage.
5. When the RF input is applied to the terminated port, the absolute maximum power is +30 dBm.
6. Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

## Truth Table

C1	C2	C3	C4	RFC- RF1	RFC- RF2	RFC- RF3	RFC- RF4
1	0	0	0	On	Off	Off	Off
0	1	0	0	Off	On	Off	Off
0	0	1	0	Off	Off	On	Off
0	0	0	1	Off	Off	Off	On

Recommended PCB Layout <sup>7</sup>

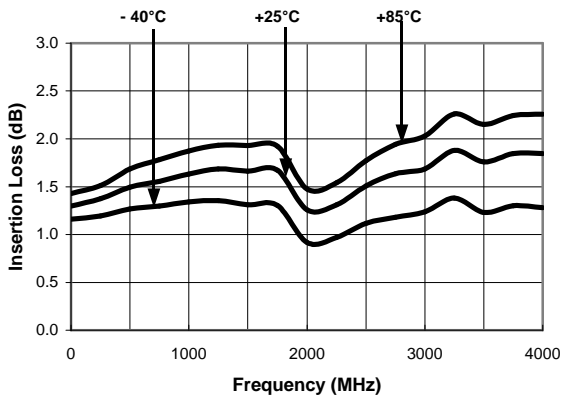
7. Application Note C2083 is available on line at [www.macom.com](http://www.macom.com)

Specifications subject to change without notice.

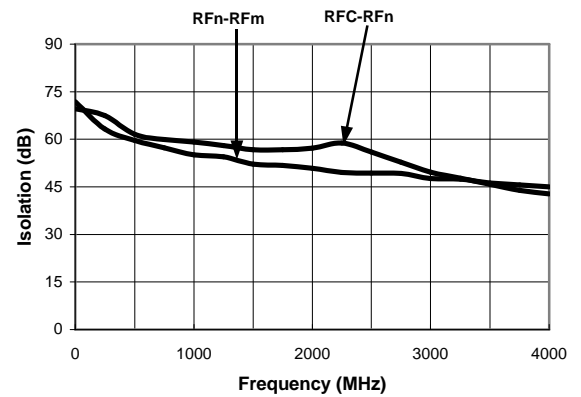
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Typical Performance Curves

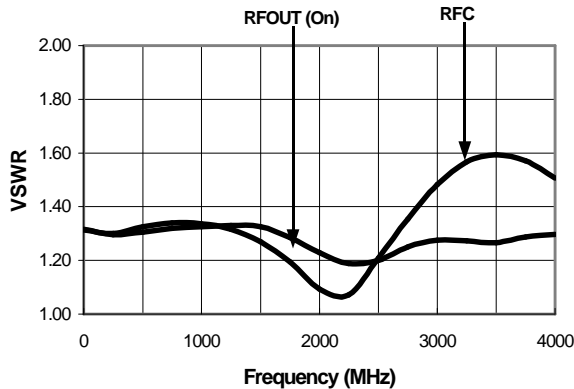
Insertion Loss vs. Frequency



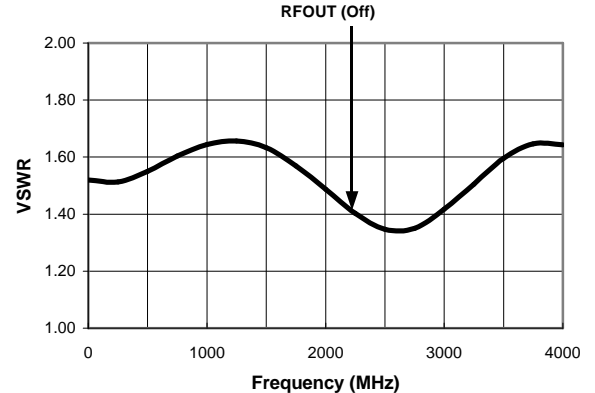
Isolation (dB) vs. Frequency



On VSWR vs. Frequency



VSWR (Terminations) vs. Frequency



Ordering Information

Part Number	Package
SW90-0003	Bulk Packaging
SW90-0003TR	Tape and Reel (1K Reel)
SW90-0003-TB	Units Mounted on Test Board

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