

## GaAs SPDT Terminated Switch DC - 2.5 GHz

M/A-COM Products  
Rev. V7

### Features

- Very Low Power Consumption
- High Isolation: 30 dB up to 2 GHz
- Very High Intercept Point: 46 dBm IP<sub>3</sub>
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Low Cost SOIC-8 Plastic Package
- Tape and Reel Packaging Available

### Description

M/A-COM's SW-338 is a GaAs MMIC SPDT terminated switch in a low cost SOIC 8-lead surface mount plastic package. The SW-338 is ideally suited for use where very low power consumption is required.

Typical applications include transmit/receive switching, switch matrices, and filter banks in systems such as radio and cellular equipment, PCM, GPS, fiber optic modules, and other battery powered radio equipment.

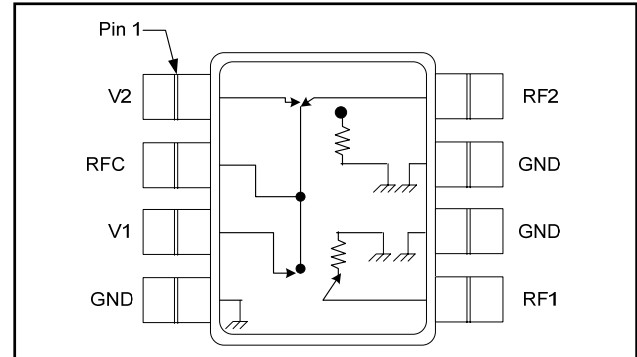
The SW-338 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

### Ordering Information <sup>1,2</sup>

Part Number	Package
MASWSS0180	Bulk Packaging
MASWSS0180TR	1000 piece reel
MASWSS0180SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

### Functional Schematic



### Pin Configuration

Pin No.	Function	Pin No.	Function
1	V2	5	RF Port 1
2	RF Common	6	Ground
3	V1	7	Ground
4	Ground	8	RF Port 2

### Absolute Maximum Ratings <sup>3,4</sup>

Parameter	Absolute Maximum
Input Power 0.05 GHz 0.5 - 2.0 GHz	+27 dBm +34 dBm
Control Voltage	-8.5 V ≤ V <sub>C</sub> ≤ +5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM does not recommend sustained operation near these survivability limits.

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• **North America** Tel: 800.366.2266 / Fax: 978.366.2266

• **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300

• **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $V_C = 0\text{ V} / -2.9\text{ V}$ ,  $Z_0 = 50\ \Omega$**

Parameter	Test Conditions	Units	Min.	Typ. <sup>5</sup>	Max.
Insertion Loss	DC - 0.5 GHz	dB	—	0.55	—
	0.5 - 1.0 GHz	dB	—	0.60	0.7
	1.0 - 2.0 GHz	dB	—	0.65	—
Isolation	DC - 0.5 GHz	dB	—	50	—
	0.5 - 1.0 GHz	dB	36	43	—
	1.0 - 2.0 GHz	dB	—	35	—
VSWR On/Off	DC - 2.0 GHz	Ratio	—	1.1:1	—
Trise, Tfall	10% to 90% RF, 90% to 10 % RF	nS	—	10	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	20	—
Transients	In-Band	mV	—	25	—
1 dB Compression Point	Input Power	dBm	—	15	—
	50 MHz @ 2.9V	dBm	—	16	—
	1.0 GHz @ 2.9V	dBm	—	26	—
	50 MHz @ 5.0V	dBm	—	27	—
2nd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm)				
	50 MHz @ 2.9V	dBm	—	46	—
	1.0 GHz @ 2.9V	dBm	—	52	—
	50 MHz @ 5.0V	dBm	—	63	—
3rd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm)				
	50 MHz @ 2.9V	dBm	—	27	—
	1.0 GHz @ 2.9V	dBm	—	27	—
	50 MHz @ 5.0V	dBm	—	47	—
Control Current	$ V_C  = 2.9\text{ V}$		—	15	35

5. Typical values represent performance at middle of frequency range noted.

### Truth Table <sup>6</sup>

Control Inputs		Condition of Switch RF Common to Each RF Port	
V1	V2	RFC-RF1	RFC-RF2
1	0	ON	OFF
0	1	OFF	ON

6. 0 = 0 V  $\pm$  0.2 V, 1 = -2.9 V to -5.0 V

### Handling Procedures

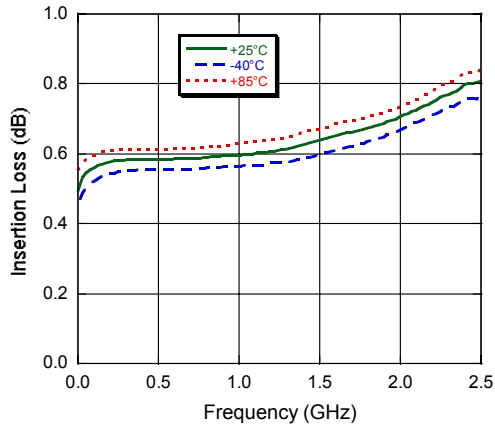
Please observe the following precautions to avoid damage:

### Static Sensitivity

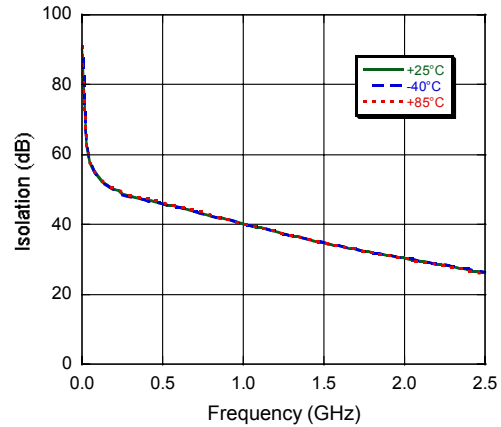
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

## Typical Performance Curves

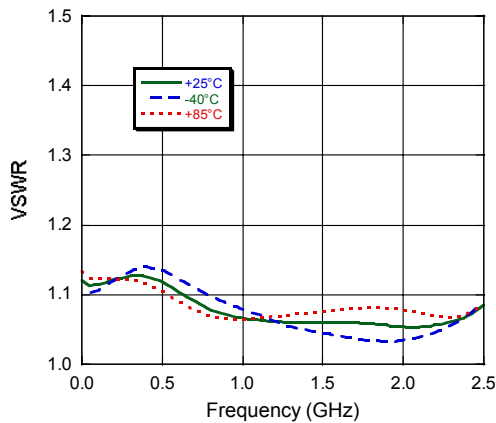
**Insertion Loss**



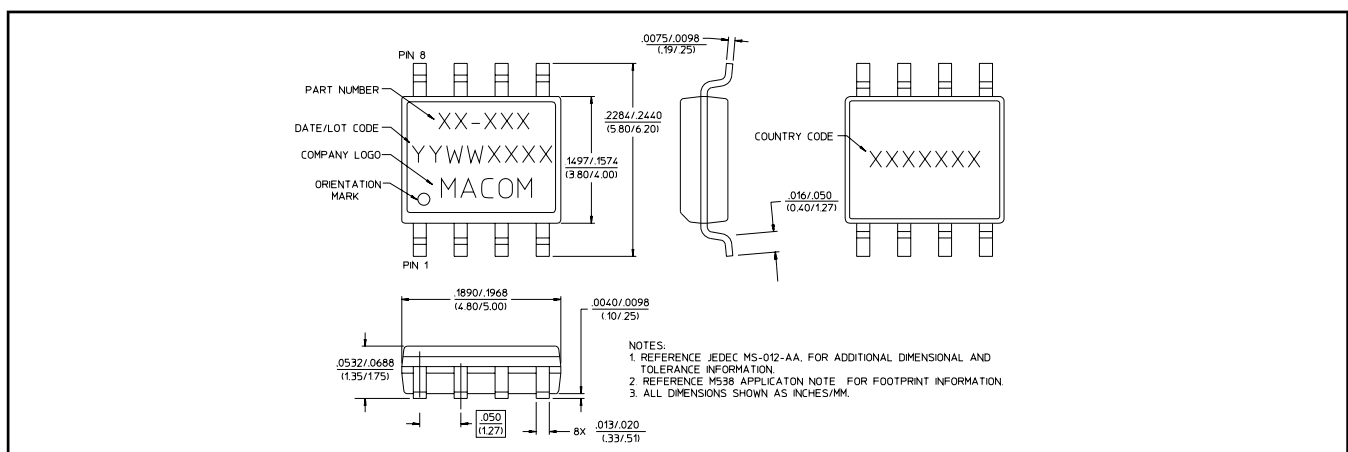
**Isolation**



**VSWR**



## SOIC-8<sup>†</sup>



<sup>†</sup> Meets JEDEC moisture sensitivity level 1 requirements.

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