

## GaAs SPDT Terminated Switch DC - 2.5 GHz

Rev. V2

### 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
- Lead-Free SOIC-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of SW-338

### Description

M/A-COM's MASWSS0180 is a GaAs MMIC SPDT terminated switch in a lead-free SOIC 8-lead surface mount plastic package. The MASWSS0180 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.

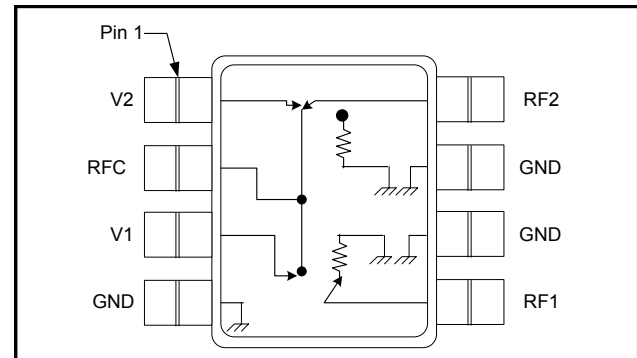
The MASWSS0180 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

### 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.

\* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

## GaAs SPDT Terminated Switch DC - 2.5 GHz

Rev. V2

**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}$	$\mu\text{A}$	—	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

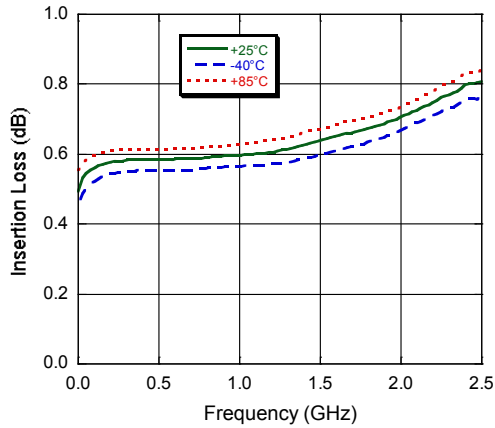
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

## GaAs SPDT Terminated Switch DC - 2.5 GHz

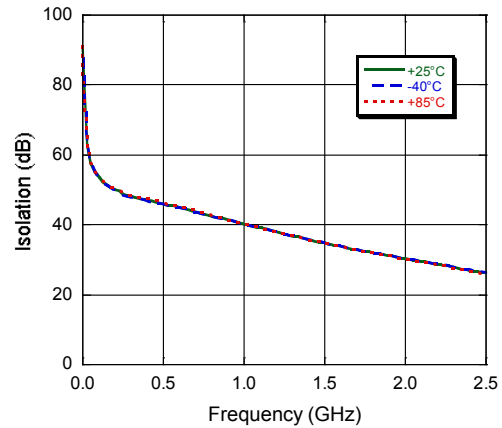
Rev. V2

### Typical Performance Curves

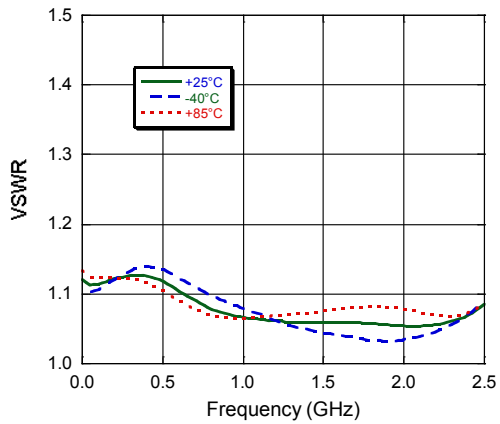
**Insertion Loss**



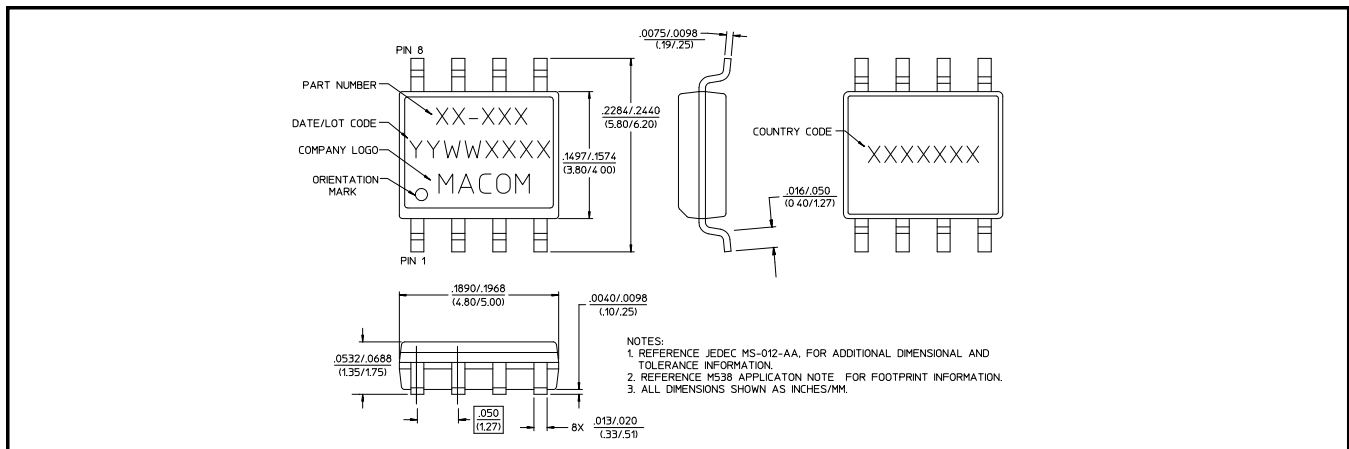
**Isolation**



**VSWR**



### Lead-Free SOIC-8†



† Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

4

---

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.  
Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.