

Features

- Very Low DC Power Consumption: 100 μ W
- Low Insertion Loss: 0.5 dB
- High Isolation: 25 dB up to 2 GHz
- Very High Intercept Point: 45 dBm IP₃
- Nanosecond Switching Speed
- Lead-Free SOIC-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of the SW-239

Description

The MASWSS0157 is a GaAs MMIC SPDT switch in a lead-free SOIC 8-lead surface mount plastic package. This device is ideally suited for use where low power consumption is required.

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

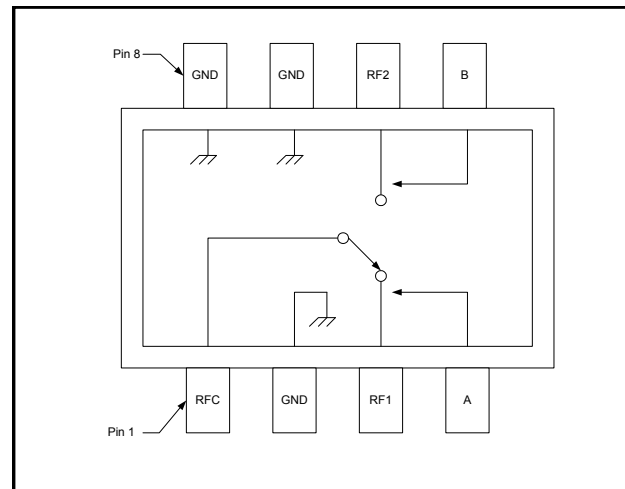
The MASWSS0157 is fabricated using a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information ¹

Part Number	Package
MASWSS0157	Bulk Packaging
MASWSS0157TR	1000 piece reel
MASWSS0157TR-3000	3000 piece reel
MASWSS0157SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Function
1	RF Common
2	Ground
3	RF Port 1
4	Control A
5	Control B
6	RF Port 2
7	Ground
8	Ground

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

GaAs SPDT Switch DC - 2.5 GHz

Rev. V4

Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_c = 0\text{ V} / -5\text{ V}$, $Z_0 = 50\ \Omega$ ²

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	DC - 0.1 GHz	dB	—	0.4	—
	DC - 0.5 GHz		—	0.4	—
	DC - 1.0 GHz		—	0.5	0.8
	DC - 2.0 GHz		—	0.6	—
Isolation	DC - 0.1 GHz	dB	—	56	—
	DC - 0.5 GHz		—	43	—
	DC - 1.0 GHz		30	33	—
	DC - 2.0 GHz		—	24	—
VSWR	DC - 2.0 GHz	Ratio	—	1.4:1	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	—	2	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	ns	—	4	—
Transients	In-Band	mV	—	15	—
1 dB Compression Point	Input Power, 0.05 GHz	dBm	—	21	—
	Input Power, 0.5 - 2.0 GHz		—	27	—
2nd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +6 dBm) 0.05 GHz	dBm	—	55	—
	0.5 - 2.0 GHz		—	68	—
3rd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +6 dBm) 0.05 GHz	dBm	—	40	—
	0.5 - 2.0 GHz		—	45	—
Control Current	$\frac{1}{2}V_c\frac{1}{2} = 5\text{ V}$	μA	—	20	25

2. For positive voltage control, external DC blocking capacitors are required on all RF ports as well as the Ground ports which should be pulled up to the positive voltage control level. (Refer to Application Note M521 - "Positive Voltage Control of GaAs MMIC Control Devices").

Absolute Maximum Ratings^{3,4}

Parameter	Absolute Maximum
Input Power 0.05 GHz 0.5 - 2.0 GHz	+27 dBm +34 dBm
Control Voltage	$-8.5\text{ V} \leq V_c \leq +5\text{ V}$
Operating Temperature	-40°C to $+85^\circ\text{C}$
Storage Temperature	-65°C to $+150^\circ\text{C}$

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.

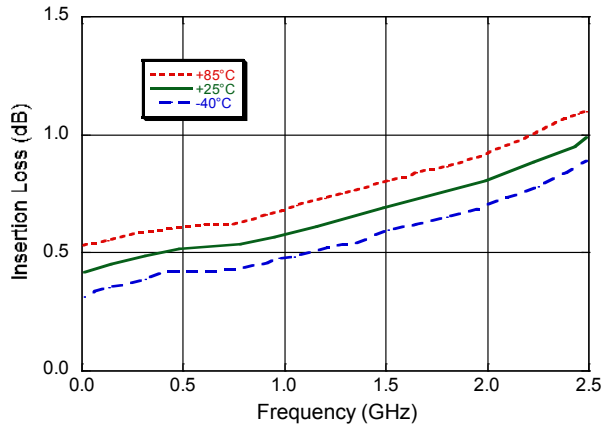
Truth Table⁵

Control Inputs		Condition of Switch RF Common to each RF Port	
A	B	RF1	RF2
1	0	On	Off
0	1	Off	On

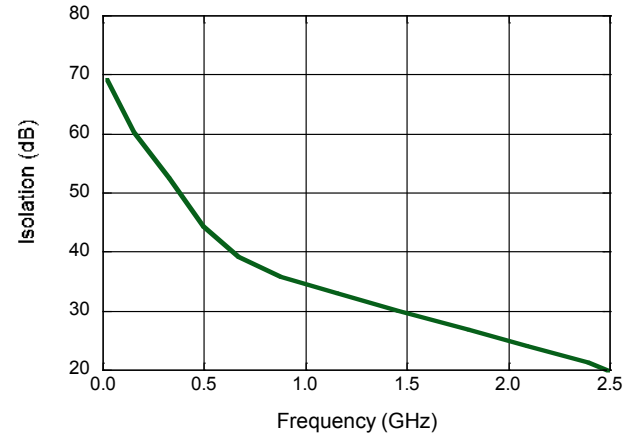
5. 0 = 0 V to -0.2 V, 1 = -5 V to -8 V

Typical Performance Curves

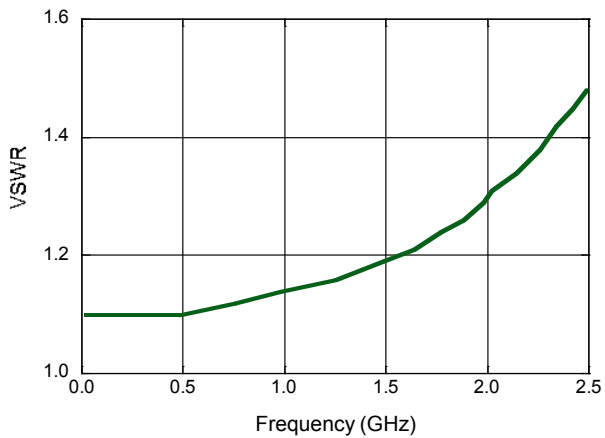
Insertion Loss



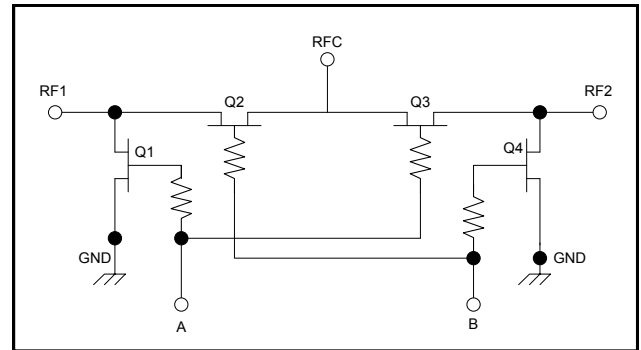
Isolation



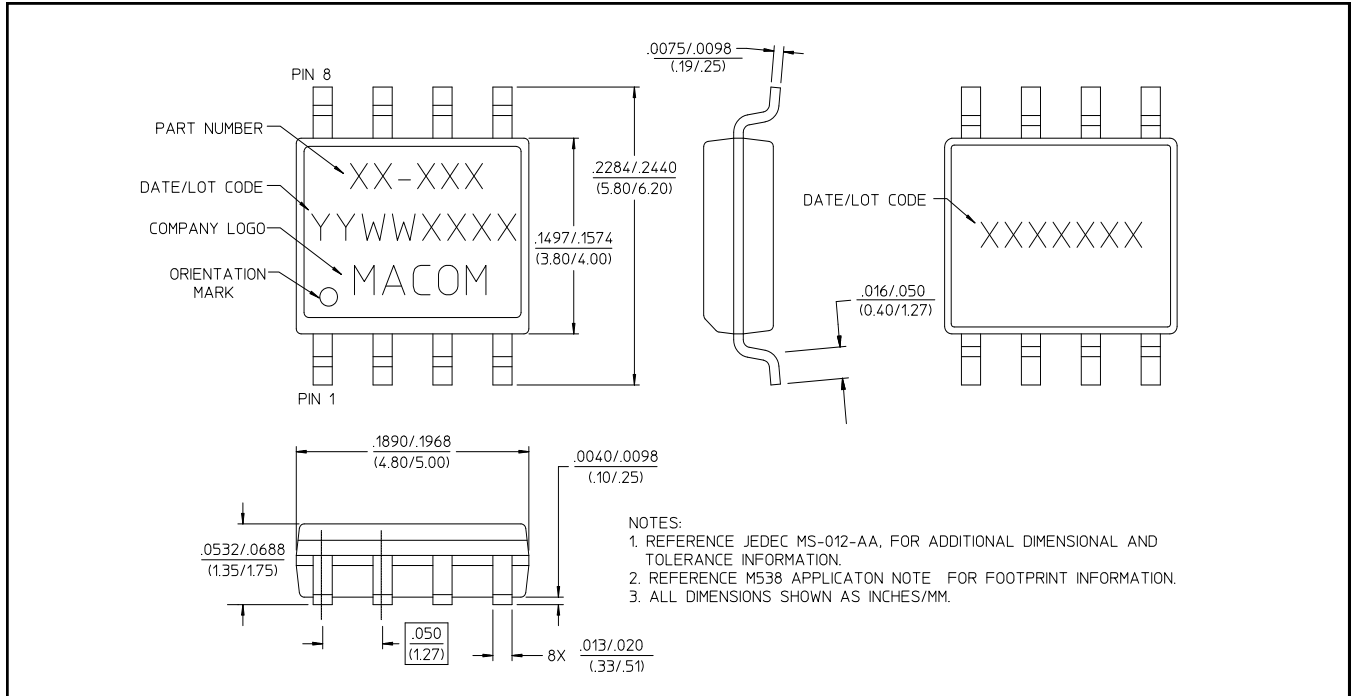
VSWR



Electrical Schematic



Lead-Free SOIC-8†



† Reference Application Note M538 for lead-free solder reflow recommendations.

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.

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.