MASWSS0180

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_3
- 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.

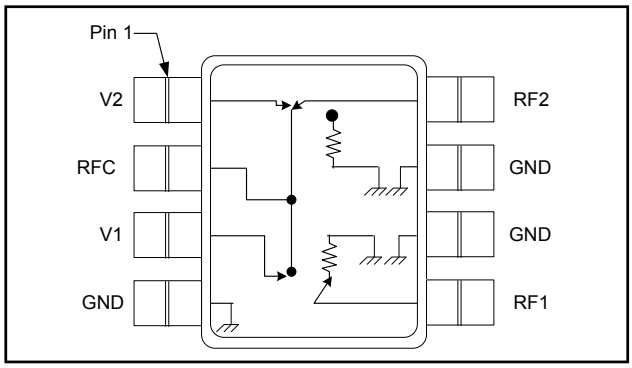
The MASWSS0180 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information [1,2]

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 [3,4]

Parameter	Absolute Maximum
Input Power 0.05 GHz 0.5 - 2.0 GHz	 +27 dBm +34 dBm
Control Voltage	-8.5 V $\leq V_C \leq$ + 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.

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- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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Electrical Specifications: T_A = 25°C, V_C = 0 V / -2.9 V, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ. [5]	Max.
Insertion Loss	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB	— — —	0.55 0.60 0.65	— 0.7 —
Isolation	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB	— 36 —	50 43 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 50 MHz @ 2.9V 1.0 GHz @ 2.9V 50 MHz @ 5.0V 1.0 GHz @ 5.0V	 dBm dBm dBm dBm	 — — — —	 15 16 26 27	 — — — —
2nd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm) 50 MHz @ 2.9V 1.0 GHz @ 2.9V 50 MHz @ 5.0V 1.0 GHz @ 5.0V	 dBm dBm dBm dBm	 — — — —	 46 52 63 82	 — — — —
3rd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm) 50 MHz @ 2.9V 1.0 GHz @ 2.9V 50 MHz @ 5.0V 1.0 GHz @ 5.0V	 dBm dBm dBm dBm	 — — — —	 27 27 47 50	 — — — —
Control Current	$\lvert V_C \rvert$ = 2.9 V	µA	—	15	35

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

Truth Table [6]

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 ± 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.

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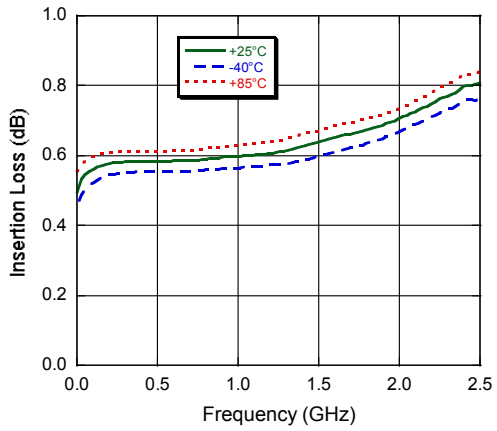
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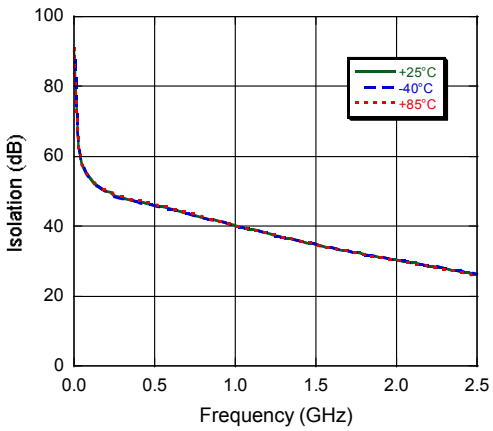
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Typical Performance Curves

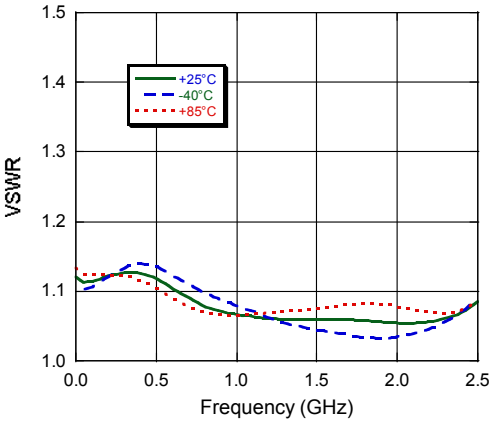
Insertion Loss



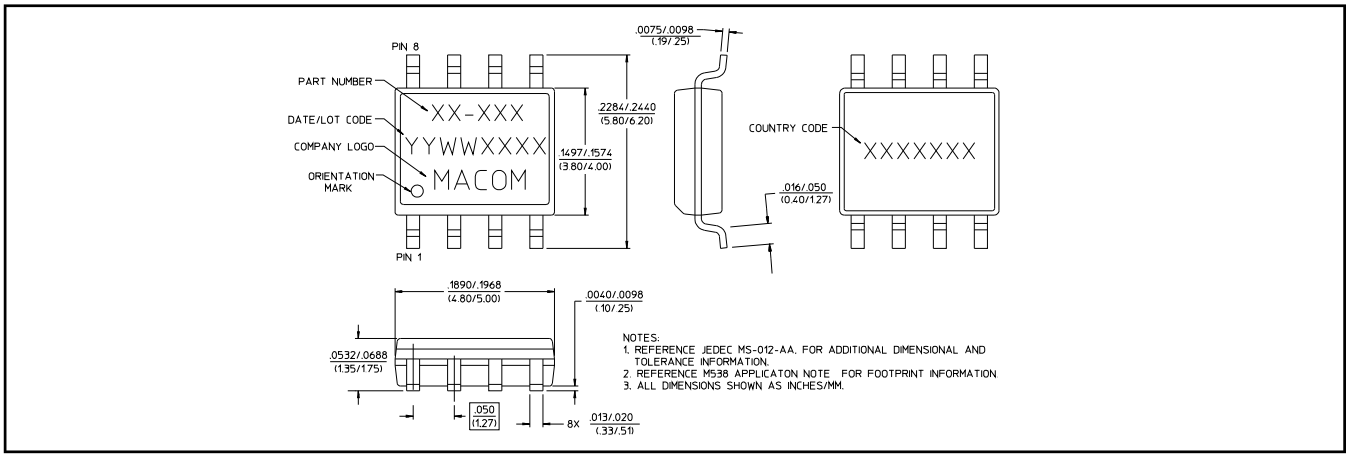
Isolation



VSWR



Lead-Free SOIC-8†



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

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