tyco Electronics

RoHS Compliant

M/ACOM

High Power GaAs SPDT Switch
DC - 2.0 GHz

MASWSS0161
V3

Features

- Positive Supply and Control Voltages
- 1 dB Compression Point: +36 dBm Typical, 8 V
- 3rd Order Intercept Point: +65 dBm Typical, 8 V
- Low Insertion Loss: 0.4 dB Typical
- Low Power Consumption: 100 µW
- Fast Switching Speed
- Lead-Free SOIC-8 Plastic Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Re-flow Compatible
- RoHS* Compliant Version of SW-277

Description

M/A-COM's MASWSS0161 is a GaAs MMIC SPDT switch in a lead free SOIC-8 lead surface mount plastic package. The MASWSS0161 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 MASWSS0161 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
MASWSS0161	Bulk Packaging
MASWSS0161TR	1000 piece reel

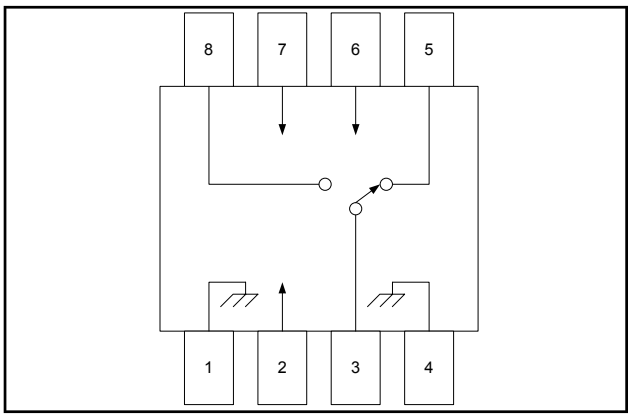
1. Reference Application Note M513 for reel size information.

Truth Table [2]

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

2. "0" = 0 to +0.2 V @ 20 µA maximum.
   "1" = +5 V @ 20 µA typical to 10 V @ 500 µA maximum.

Functional Schematic



Pin Configuration

Pin No.	Description	Pin No.	Description
1	Ground, Thermal Contact	5	RF Port 1 [3]
2	V_{DD}	6	Control A
3	RFC[3]	7	Control B
4	Ground, Thermal Contact	8	RF Port 2 [3]

3. External DC blocking capacitors required on all RF ports.

Absolute Maximum Ratings [4,5]

Parameter	Absolute Maximum
Input Power - 0.5 - 2.0 GHz 5 V Control and Supply 8 V Control and Supply 10 V Control and Supply	 +37 dBm +40 dBm +42 dBm
Power Dissipation	1.0 W
Supply Voltage	-1 V ≤ V_{DD} ≤ + 12 V
Control Voltage	-1 V ≤ V_C ≤ V_{DD} + 0.2 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Thermal Resistance [6]	θjc = 87°C/W

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. M/A-COM does not recommend sustained operation near these survivability limits.
6. Thermal resistance is given for T_A = 25°C. T_{CASE} is the temperature of leads 1 and 4.

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

- **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

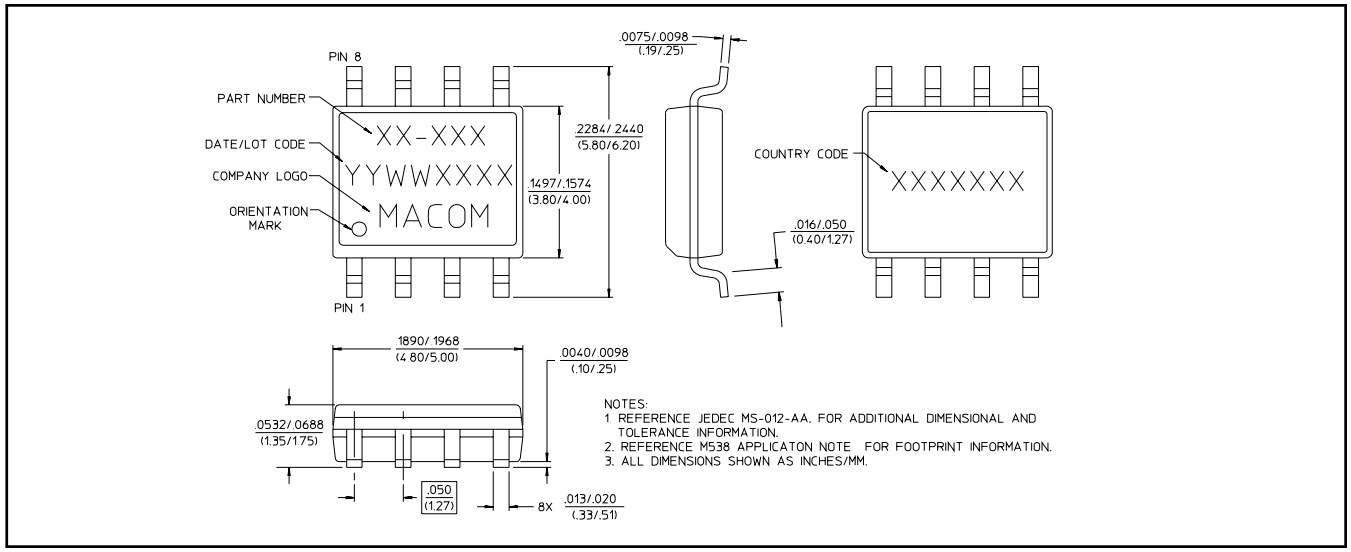
Visit www.macom.com for additional data sheets and product information.

Electrical Specifications [7]: T_A = +25°C, V_{DD} = +5 V, V_C = +5 V / 0 V, P_{IN} = +30 dBm

Parameter	Test Conditions	Units	Min.	Typ.[8]	Max.
Insertion Loss	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB	— — —	0.45 0.55 0.6	— 0.65 —
Isolation	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB	— 27 —	30 32 27	— — —
VSWR	DC - 2.0 GHz	Ratio	—	1.2:1	—
1 dB Compression	Input Power (5 V Supply/Control) 0.9 GHz Input Power (8 V Supply/Control) 0.9 GHz	dBm dBm	— —	33 35.8	— —
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	30	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	35	—
Transients	In-Band	mV	—	12	—
3rd Order Intercept	Measured Relative to Input Power, two-tone up to +10 dBm (5 V Supply/Control) 0.9 GHz (8 V Supply/Control) 0.9 GHz	 dBm dBm	 — —	 55 65	 — —
Control Current	V_C = +5 V	µA	—	—	20
Supply Current	V_{DD} = +5 V	µA	—	—	60

7. All specifications apply when operated with control voltages of 0 V for V_C low and 5 to 10 V for V_C high, and 50 Ω impedance at all RF ports, unless otherwise specified. High power (greater than 1 W) handling specifications apply to cold switching only. For input powers under 1 W, hot switching can be used. The high control voltage must be within ± 0.2 V of the supply voltage. External DC blocking capacitors are required on all RF ports.
8. Typical values listed for middle of frequency range noted.

Lead-Free SOIC-8†



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

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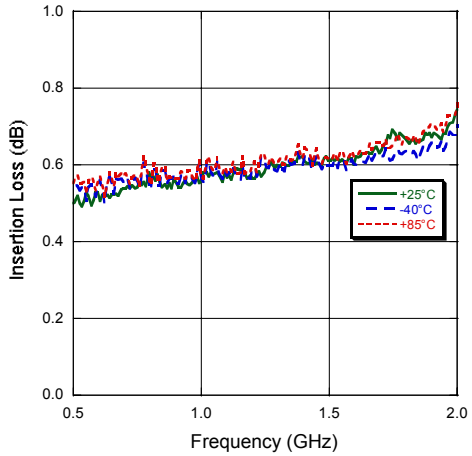
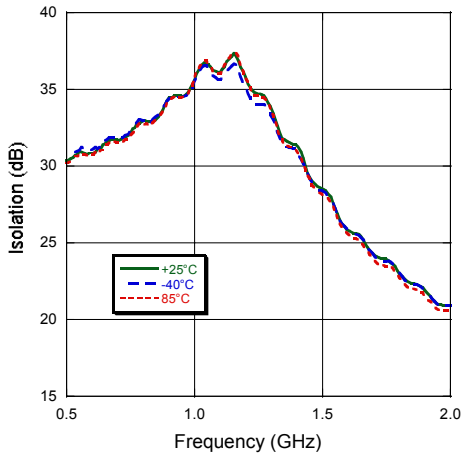
Typical Performance Curves

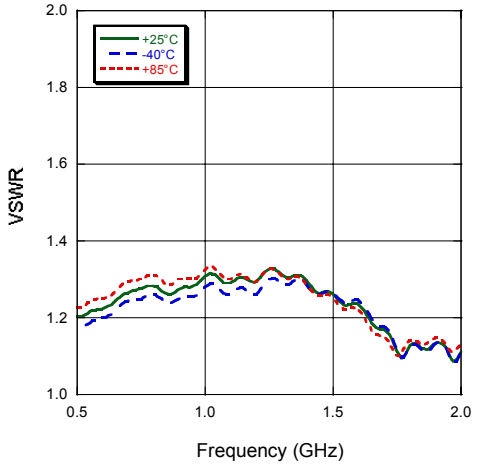
Insertion Loss



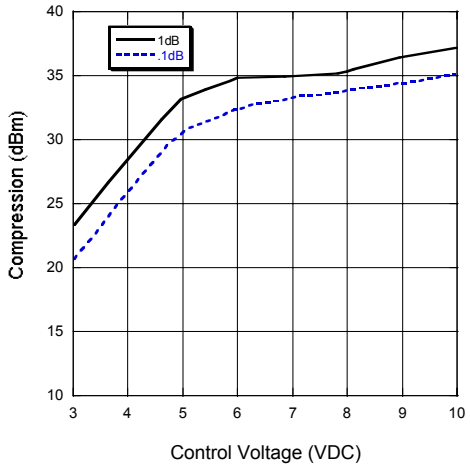
Isolation



VSWR



Compression vs. Control Voltage @ 900 MHz



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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