SW-277

High Power GaAs SPDT Switch
DC - 2.0 GHz

Rev. V6

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

Description

M/A-COM's SW-277 is a GaAs MMIC SPDT switch in a SOIC-8 lead surface mount plastic package. The SW-277 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 SW-277 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
SW-277	Bulk Packaging
SW-277TR	1000 piece reel

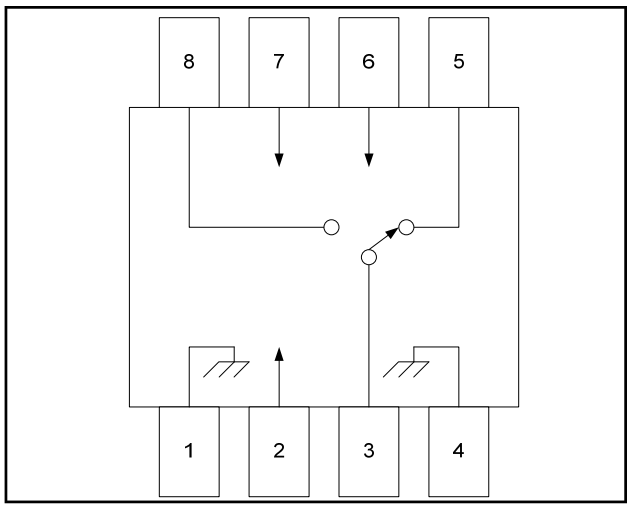
1. Reference Application Note M513 for reel size information.

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.

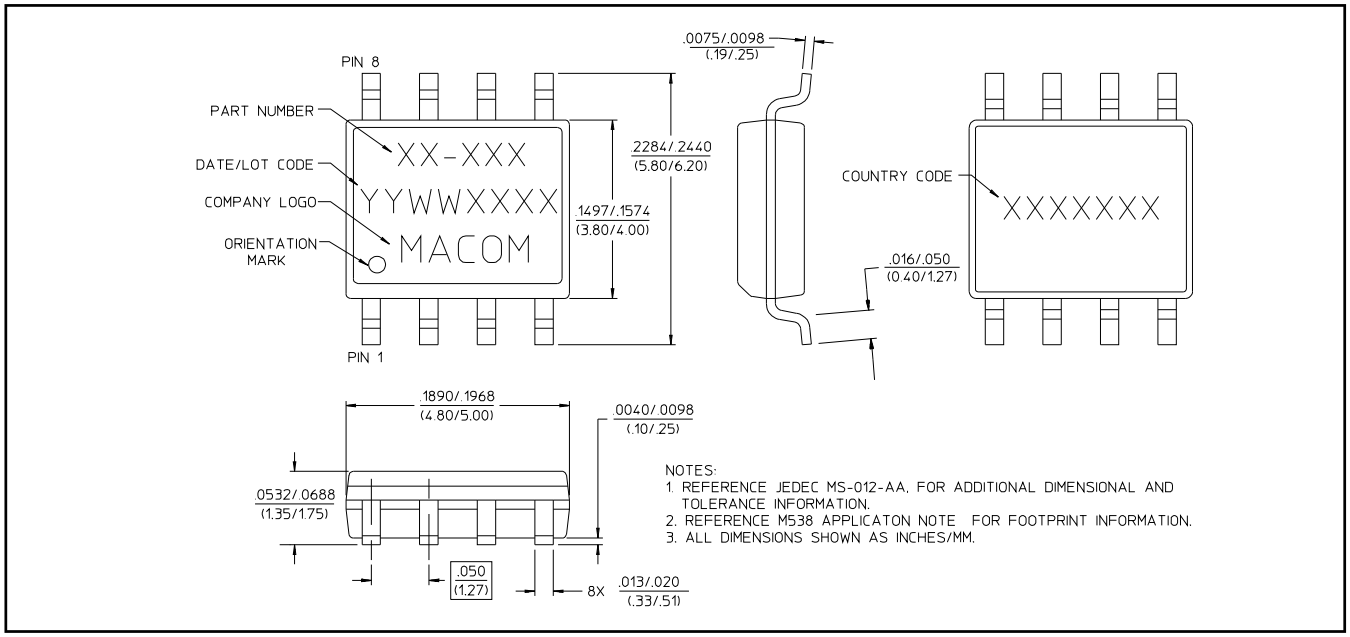
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.

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.

SOIC-8



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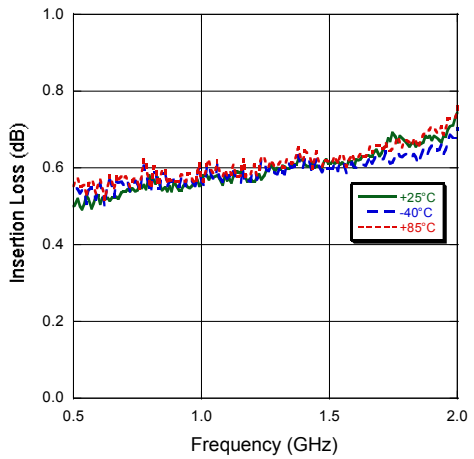
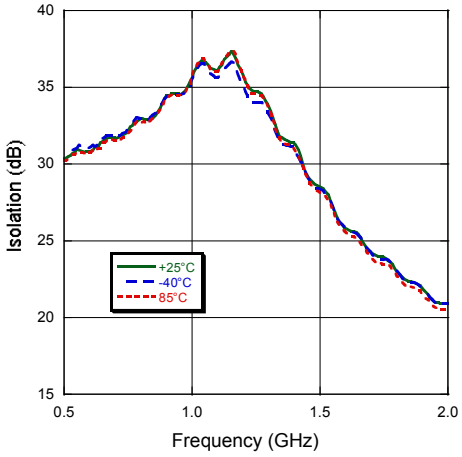
Typical Performance Curves

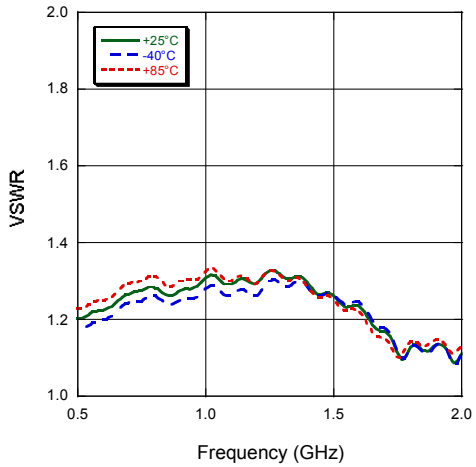
Insertion Loss



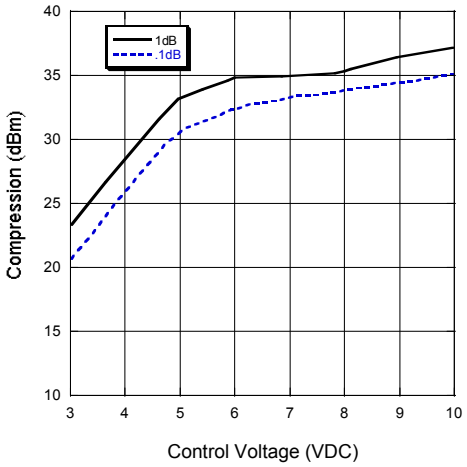
Isolation



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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