

GaAs SPST Switch DC - 2.5 GHz

Rev. V7

Features

- Very Low Power Consumption: 50 μ W
- Low Insertion Loss: 1.0 dB
- High Isolation: 35 dB up to 2 GHz
- Very High Intercept Point: 46 dBm IP3
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Low Cost SOIC-8 Plastic Package
- Tape and Reel Packaging Available

Description

M/A-COM's SW-259 is a GaAs MMIC SPST switch in a low cost SOIC-8 lead surface mount plastic package. The SW-259 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.

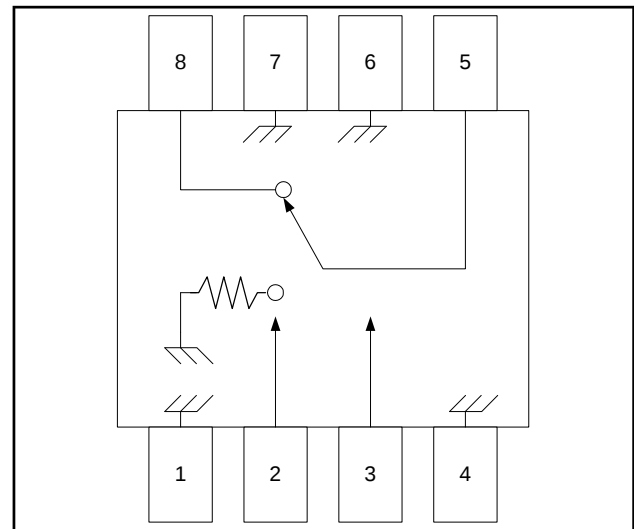
The SW-259 is fabricated using a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information ¹

Part Number	Package
SW-259 PIN	Bulk Packaging
SW-259TR	1000 piece reel

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

PIN No.	Description	PIN No.	Description
1	Ground	5	RF2
2	A	6	Ground
3	B	7	Ground
4	Ground	8	RF1

Absolute Maximum Ratings ²

Parameter	Absolute Maximum
Input Power ³ 0.05 GHz 0.5-2.0 GHz	+27 dBm +34 dBm
Control Voltage	+5 V, -8.5 V
Storage Temperature	-65°C to +150°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.

3. When the RF Input power is applied to a terminated port, the absolute maximum is +32 dBm.

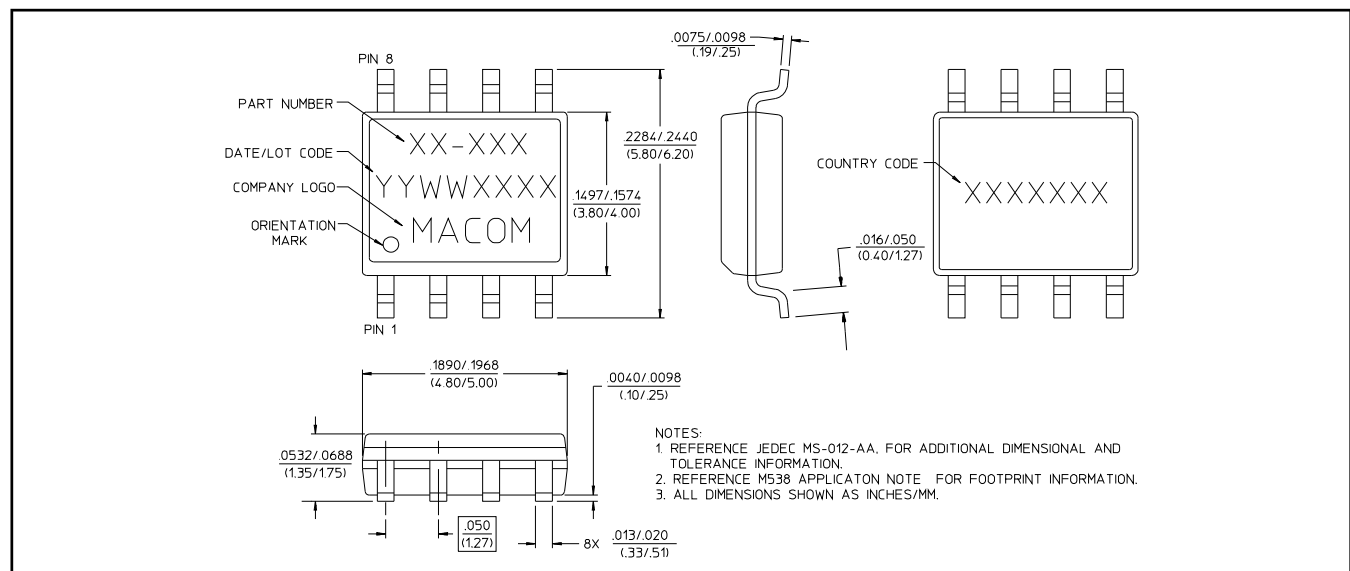
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Electrical Specifications: $T_A = +25^\circ\text{C}$ ⁴

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	DC - 0.1 GHz	dB	—	0.5	0.6
	DC - 0.5 GHz	dB	—	0.8	1.0
	DC - 1.0 GHz	dB	—	1.0	1.2
	DC - 2.0 GHz	dB	—	1.4	1.6
Isolation	DC - 0.1 GHz	dB	62	65	—
	DC - 0.5 GHz	dB	55	58	—
	DC - 1.0 GHz	dB	45	48	—
	DC - 2.0 GHz	dB	32	35	—
VSWR On VSWR Off	DC - 2.0 GHz	Ratio	1.2:1	—	—
	DC - 2.0 GHz	Ratio	1.2:1	—	—
1 dB Compression	Input Power	dBm	—	18	—
	0.05 GHz 0.5-2.0 GHz	dBm	—	23	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	4	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	8	—
Transients	In-Band	mV	—	35	—
2nd Order Intercept	Measured Relative to Input Power, two-tone up to +5 dBm	dBm	—	55	—
	0.05 GHz 0.5 - 2.0 GHz	dBm	—	68	—
3rd Order Intercept	Measured Relative to Input Power, two-tone up to +5 dBm	dBm	—	40	—
	0.05 GHz 0.5 - 2.0 GHz	dBm	—	46	—

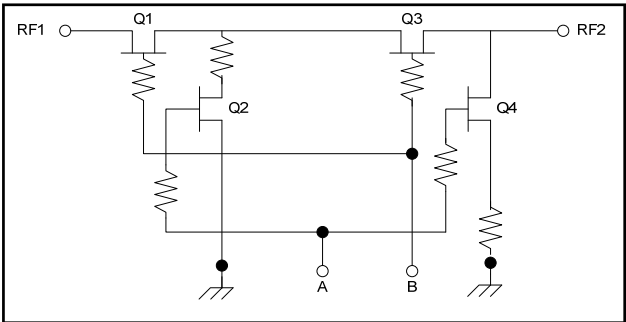
4. All measurements with 0, -5 V control voltages at 1 GHz in a 50 Ω system, unless otherwise specified.

SOIC-8


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Electrical Schematic



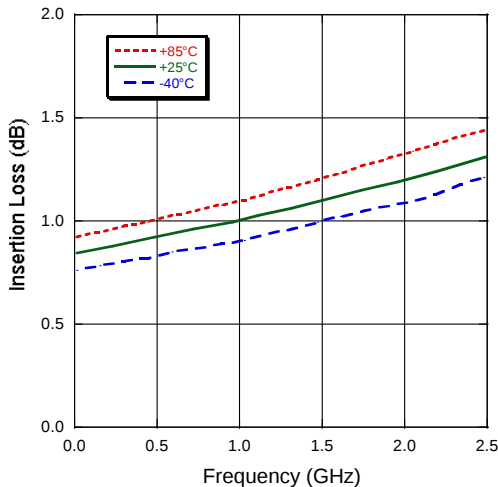
Truth Table^{5,6}

Control Inputs		Condition of Switch
A	B	RF State
1	0	On
0	1	Off

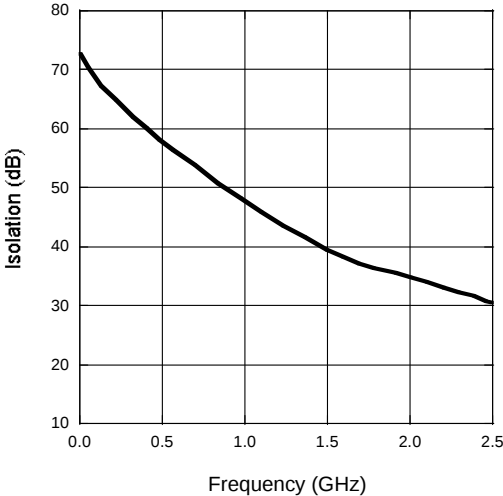
5. "0" = 0 to -0.2 V @ 20 mA max.
6. "1" = -5 V @ 20 mA Typ to -8V @ 600 mA max.

Typical Performance Curves

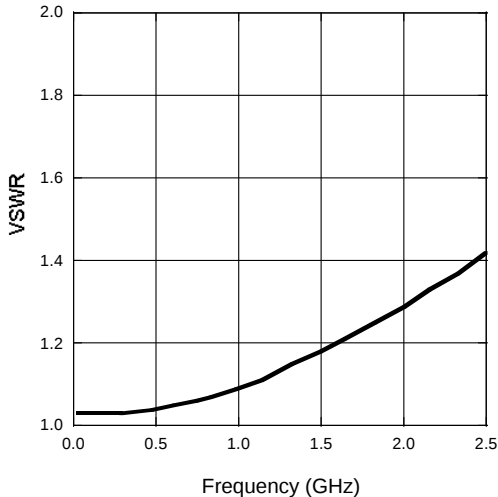
Insertion Loss



Isolation



VSWR

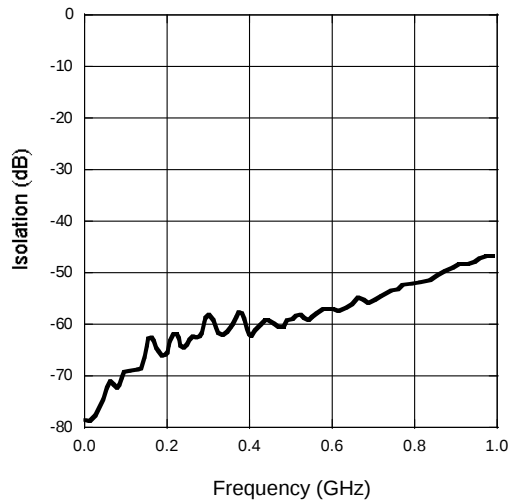


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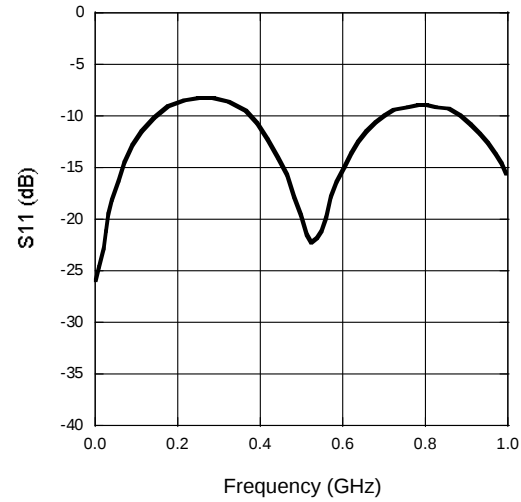
Rev. V7

Swept Data Characterized in 75 Ohms

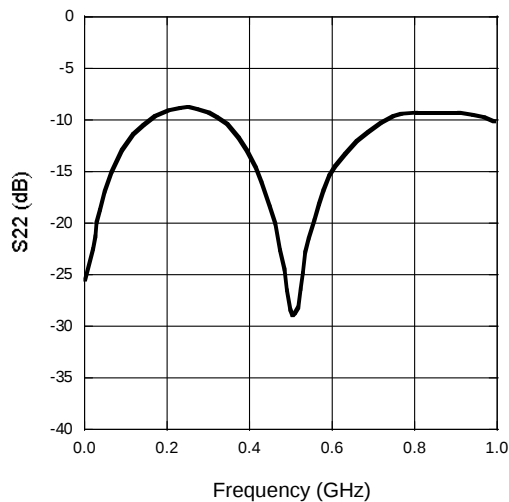
Isolation



Input Return Loss - On



Output Return Loss - On



Output Return Loss - Off

