

**GaAs SPDT Switch  
DC - 2.5 GHz**

**SW-239  
V6**

**Features**

- Very Low Power Consumption: 100  $\mu$ 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
- Temperature Range: -40°C to +85°C
- Low Cost SOIC-8 Plastic Package
- Tape and Reel Packaging Available

**Description**

M/A-COM's SW-239 is a GaAs MMIC SPDT switch in a low cost SOIC-8 lead surface mount plastic package. The SW-239 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.

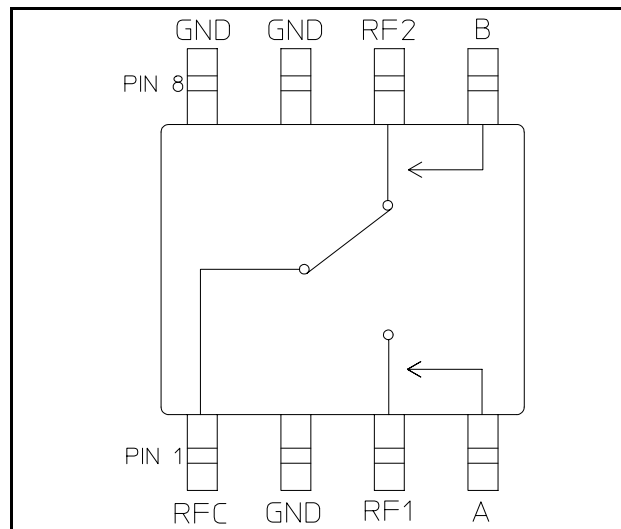
The SW-239 is fabricated using a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

**Ordering Information**

Part Number	Package
SW-239	Bulk Packaging
SW-239TR	1000 piece reel

Note: Reference Application Note M513 for reel size information.

**Functional Schematic**



**Pin Configuration**

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

**Absolute Maximum Ratings <sup>1,2</sup>**

Parameter	Absolute Maximum
Input Power 0.05 GHz 0.5-2.0 GHz	+27 dBm +34 dBm
Control Voltage	-8.5 V $\leq$ V <sub>C</sub> $\leq$ +5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. M/A-COM does not recommend sustained operation near these survivability limits.

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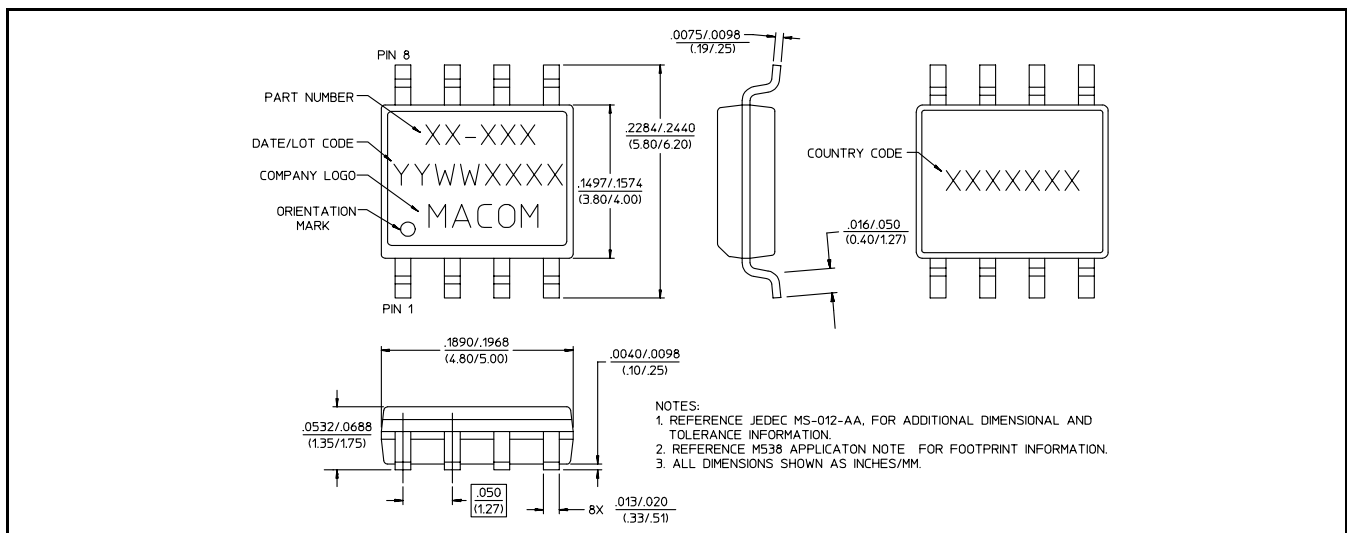
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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $V_C = 0\text{ V} / -5\text{ V}$ ,  $Z_0 = 50\text{ Ohms}^3$**

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	DC - 0.1 GHz	dB	—	0.4	—
	DC - 0.5 GHz	dB	—	0.4	—
	DC - 1.0 GHz	dB	—	0.5	0.8
	DC - 2.0 GHz	dB	—	0.6	—
Isolation	DC - 0.1 GHz	dB	—	56	—
	DC - 0.5 GHz	dB	—	43	—
	DC - 1.0 GHz	dB	30	33	—
	DC - 2.0 GHz	dB	—	24	—
VSWR	DC - 2.0 GHz	Ratio	—	1.2:1	—
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	dBm	—	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	dBm	—	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	dBm	—	45	—
Control Current	$ V_C  = 5\text{ V}$	$\mu\text{A}$	—	20	25

3. For positive voltage control, external DC blocking capacitors are required on all RF ports.

**SOIC-8**



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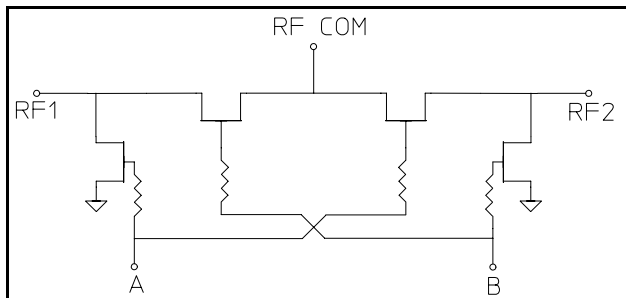
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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**Electrical Schematic**



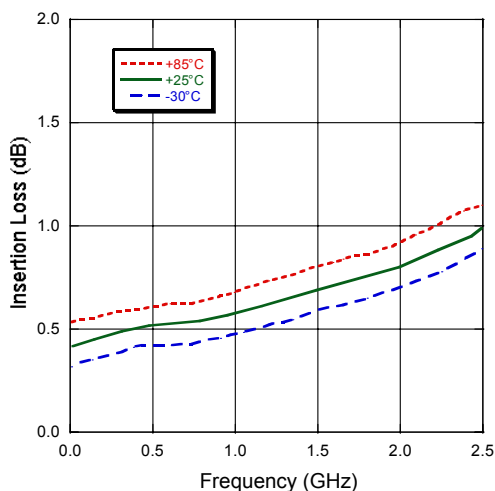
**Truth Table <sup>4</sup>**

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

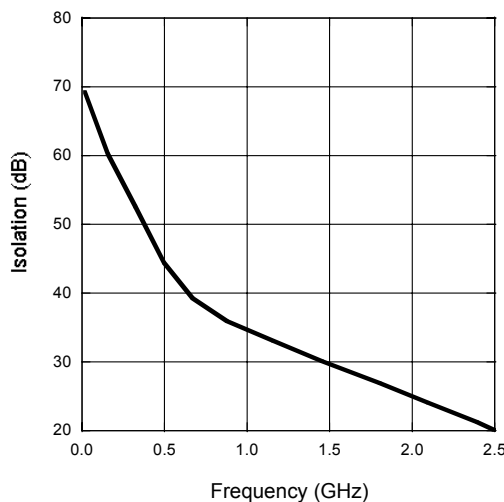
4. 0 = 0 V to -0.2 V, 1 = -5 V to -8 V

**Typical Performance Curves**

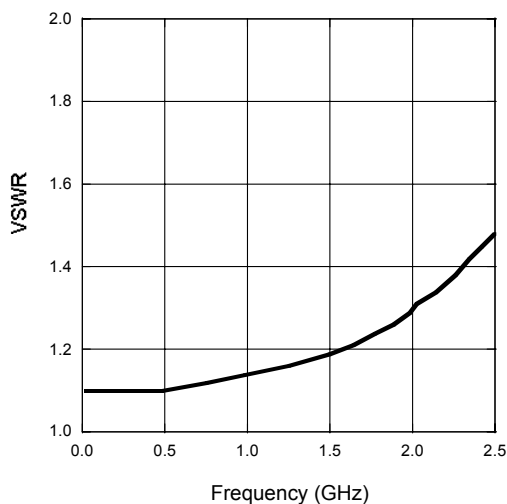
**Insertion Loss**



**Isolation**



**VSWR**



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