

# High Power GaAs SPDT Switch

## DC - 2.5 GHz

# SW-279

V2.00

### Features

- +36 dBm Typ. 1 dB Compression Point, -8V Supply
- +65 dBm Typ. 3rd Order Intercept Point, -8V Supply
- Low Insertion Loss: 0.4 dB Typical
- Low Power Consumption: 100  $\mu$ W
- Fast Switching Speed
- Low Cost SOIC8 Plastic Package
- Tape and Reel Packaging Available<sup>1</sup>

### Description

M/A-COM's SW-279 is a GaAs MMIC SPDT switch in a low cost SOIC 8-lead surface mount plastic package. The SW-279 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 SW-279 is fabricated with a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

### Electrical Specifications, $T_A = +25^\circ\text{C}$

Parameter	Test Conditions <sup>2</sup>	Unit	Min.	Typ.	Max
Insertion Loss	DC – 2.0 GHz	dB		0.6	0.8
	DC – 1.0 GHz	dB		0.4	0.6
	DC – 0.5 GHz	dB		0.35	0.5
	DC – 0.1 GHz	dB		0.2	0.4
Isolation	DC – 2.0 GHz	dB	14	16	
	DC – 1.0 GHz	dB	28	32	
	DC – 0.5 GHz	dB	35	38	
	DC – 0.1 GHz	dB	35	38	
VSWR	DC – 2.0 GHz			1.2:1	
Trise, Tfall Ton, Toff Transients	10% to 90% RF, 90% to 10% RF	nS		30	
	50% Control to 90% RF, 50% Control to 10% RF	nS		35	
	In Band	mV		12	
One dB Compression Point	Input Power (5V Supply/Control)	0.9 GHz	dBm	33	
	Input Power (8V Supply/Control)	0.9 GHz	dBm	35.8	
3rd Order Intercept	Measured Relative (5V Supply/Control)	0.9 GHz	dBm	61	
	to Input Power (8V Supply/Control) (for two-tone input power up to +10 dBm)	0.9 GHz	dBm	65	

1. Refer to "Tape and Reel Packaging" Section, or contact factory.

2. All specifications apply when operated with bias voltages of 0V for Vin Low and 5 to 10V for Vin Hi, and 50 Ohm impedance at all RF ports, unless otherwise specified. High power (greater than 1W) handling specifications apply to cold switches only. For input powers under 1W, hot switching can be used. The high control voltage must be within +/- 0.2V of the supply voltage. The RF ports must be blocked outside of the package from ground or any other voltage.

Specifications Subject to Change Without Notice.

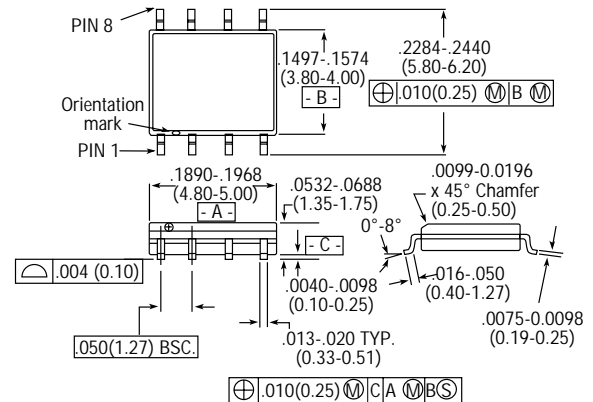
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### SO-8



8- Lead SOP outline dimensions  
Narrow body .150

(All dimensions per JEDEC No. MS-012-AA, Issue C)  
Dimensions in ( ) are in mm.

Unless Otherwise Noted: .xxx =  $\pm 0.010$  (.xx =  $\pm 0.25$ )  
.xx =  $\pm 0.02$  (.x =  $\pm 0.5$ )

### Ordering Information

Model No.	Package
SW-279 PIN	SOIC 8 Lead
SW-279TR	Forward Tape & Reel
SW-279RTR	Reverse Tape & Reel

**Absolute Maximum Ratings**

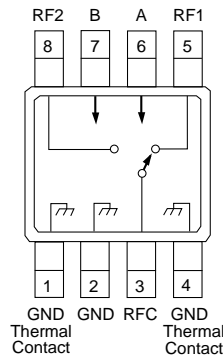
Parameter	Absolute Maximum <sup>1</sup>
Max. Input Power 0.5 – 2.0 GHz	
5V Control and Supply	+37 dBm
8V Control and Supply	+40 dBm
10V Control and Supply	+42 dBm
Power Dissipation	1.0 W
Control Voltage	-12V, +1V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Thermal Resistance <sup>2</sup> : $\theta_{JC} = 87 \text{ }^\circ\text{C/W}$	

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Thermal resistance is given for  $T_A = 25^\circ\text{C}$ .  $T_{CASE}$  is the temperature of leads 1 and 4.

**Pin Configuration**

Pin No.	Description
1	GND, Thermal Contact
2	GND
3	RF Common
4	GND, Thermal Contact
5	RF1
6	A
7	B
8	RF2

**Functional Schematic**



**Two Tone IP<sub>3</sub> Measurements**

Bias Voltage	Input Power (dBm)	3rd Order Intermodulation Products (dBC)	IP <sub>3</sub> (dBm)	Second Harmonic (dBC)
0,-5V	+27	-34	+44	-61
0,-6V	+27	-49	+51	-61
0,-7V	+27	-64	+59	-63
0,-8V	+27	-65	+59	-63
0,-10V	+27	-66	+60	-63
0,-5V	+28	-30	+43	-58
0,-6V	+28	-41	+48.5	-58
0,-7V	+28	-52	+54	-57
0,-8V	+28	-60	+58	-57
0,-10V	+28	-60	+58	-57
0,-5V	+29	-28	+43	-54
0,-6V	+29	-34	+46	-54
0,-7V	+29	-44	+51	-54
0,-8V	+29	-52	+55	-54
0,-10V	+29	-52	+55	-54
0,-5V	+30	-26	+43	-52
0,-6V	+30	-32	+46	-51
0,-7V	+30	-38	+49	-51
0,-8V	+30	-44	+52	-51
0,-10V	+30	-44	+52	-51

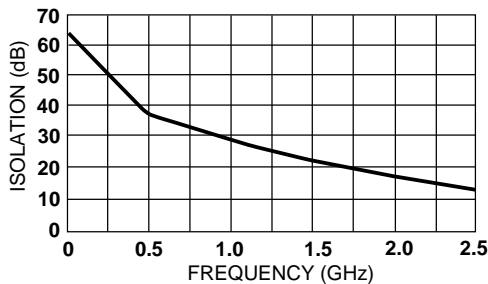
**Truth Table**

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

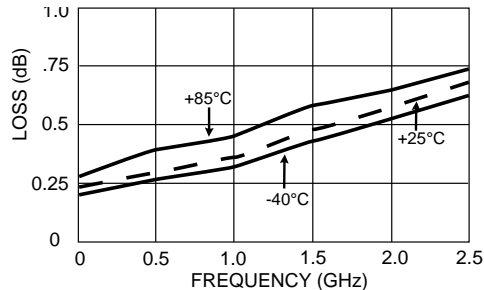
1. 0 – 0 to -0.2V @ 20  $\mu\text{A}$  max.  
1 – -5V @ 50  $\mu\text{A}$  Typ to -10V @ 800  $\mu\text{A}$  max.

**Typical Performance**

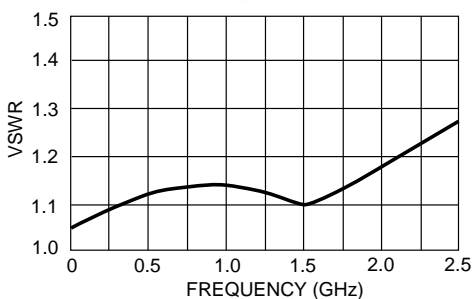
**ISOLATION vs FREQUENCY**



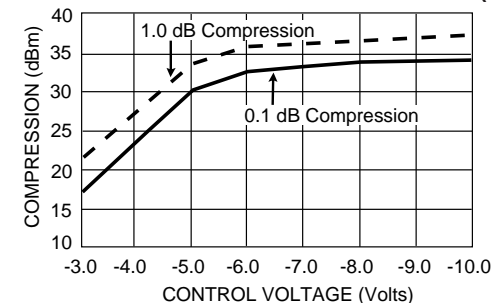
**INSERTION LOSS vs FREQUENCY**



**VSWR vs FREQUENCY**



**COMPRESSION vs CONTROL VOLTAGE (900 MHz)**



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