High Power GaAs SPDT Switch
DC - 2.5 GHz

SW-277

V3.00

Features

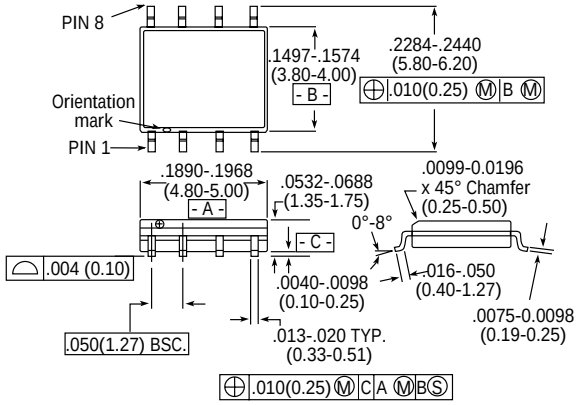
- Positive Supply and Control Voltages
- +36 dBm Typ. 1 dB Compression Point, 8V Supply
- +65 dBm Typ. 3rd Order Intercept Point, 8V Supply
- Low Insertion Loss: 0.4 dB Typical
- Low Power Consumption: 100 µW
- Fast Switching Speed
- Tape and Reel Packaging Available[1]

Description

M/A-COM's SW-277 is a GaAs MMIC SPDT switch in a low cost SOIC 8-lead surface mount plastic package. The SW-277 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-277 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

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 = ± 0.010 (.xx = ± 0.25)
.xx = ± 0.02 (.x = ±0.5)

Ordering Information

Model Number	Package
SW-277 PIN	SOIC 8-Lead Plastic Package
SW-277TR	Forward Tape and Reel
SW-277RTR	Reverse Tape and Reel

Electrical Specifications, T_A = +25°C

Parameter	Test Conditions[2]		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	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	
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) to Input Power (8V Supply/Control) (for two-tone input power up to +10 dBm)	0.9 GHz	dBm		61	
		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.

North America: Tel. (800) 366-2266 Fax (800) 618-8883 ■ Asia/Pacific: Tel. +81 3 3263 8761 Fax +81 3 3263 8769 ■ Europe: Tel. +44 (1344) 869 595 Fax +44 (1344) 300 020

Absolute Maximum Ratings

Parameter	Absolute Maximum
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
Supply Voltage	-1V, +12V
Control Voltage	-1V, Vsupply + 0.2V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Thermal Resistance[2]: θ_{jc} = 87 °C/W	

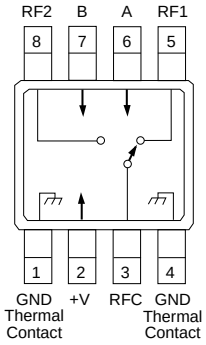
1. Operation of this device above any one of these parameters may cause permanent damage.
2. Thermal resistance is given for T_A = 25°C. T_{CASE} is the temperature of leads 1 and 4.

Pin Configuration

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

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

Functional Schematic



Two Tone IP_3 Measurements

Supply & Control Voltage	Input Power (dBm)	3rd Order Intermodulation Products (dBc)	IP_3 (dBm)	Second Harmonic (dBc)
0,5V	+27	-32	+43	-74
0,6V	+27	-45	+49.5	-77
0,7V	+27	-58	+56	-79
0,8V	+27	-72	+63	-79
0,10V	+27	-72	+63	-81
0,5V	+28	-30	+43	-69
0,6V	+28	-40	+48	-76
0,7V	+28	-53	+54.5	-78
0,8V	+28	-64	+60	-79
0,10V	+28	-72	+64	-80
0,5V	+29	-28	+43	-59
0,6V	+29	-37	+47.5	-74
0,7V	+29	-49	+53.5	-75
0,8V	+29	-50	+54	-75
0,10V	+29	-50	+54	-75
0,5V	+30	-36	+43	-67
0,6V	+30	-46	+48	-73
0,7V	+30	-50	+53	-75
0,8V	+30	-50	+55	-75
0,10V	+30	-50	+55	-75

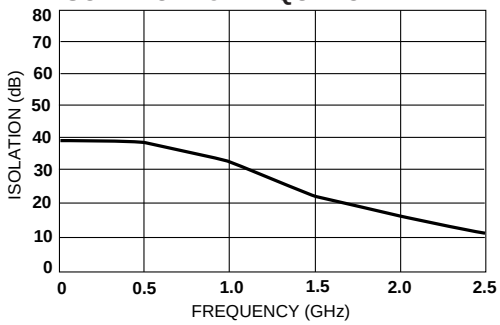
Truth Table

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

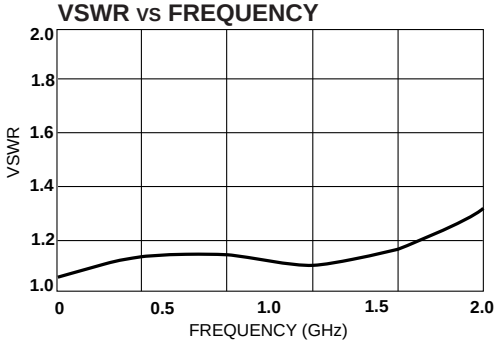
"0" – 0 to +0.2V @ 20 µA max.
"1" – +5V @ 20 µA Typ to 10V @ 500 µA max.

Typical Performance

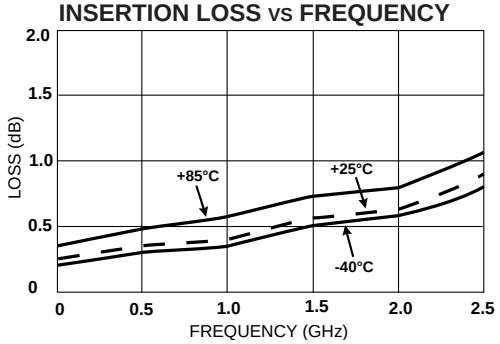
ISOLATION vs FREQUENCY



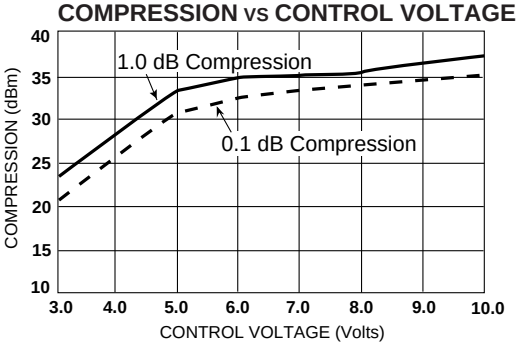
VSWR vs FREQUENCY



INSERTION LOSS vs FREQUENCY



COMPRESSION vs CONTROL VOLTAGE (900MHz)



Specifications Subject to Change Without Notice.

North America: Tel. (800) 366-2266 Fax (800) 618-8883 ■ Asia/Pacific: Tel. +81 3 3263 8761 Fax +81 3 3263 8769 ■ Europe: Tel. +44 (1344) 869 595 Fax +44 (1344) 300 020