T/R Diversity Switch
DC–2.5 GHz

NEW July '93 **SW-923**

Features

- +36 dBm Typ. 1 dB Compression Point, 8V Supply
- Two Tone IP_3 @ 1 Watt – each tone 44 dBm
- Low Insertion Loss: 0.7 dB Typical
- Low Power Consumption: 100µW
- Low Cost SSOP20 Plastic Package

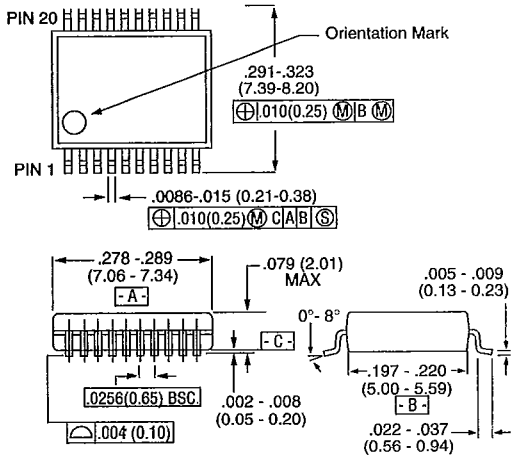
Description

M/A-COM's SW-923 is a GaAs MMIC transmit/receive antenna diversity switch for applications up to 2.5 GHz, with power levels up to 2 watts.

The SW-923 is ideally suited for use where very low power consumption is required. Typical applications include transmit/receive diversity switching in land mobile and portable transceiver applications and other battery powered radio equipment.

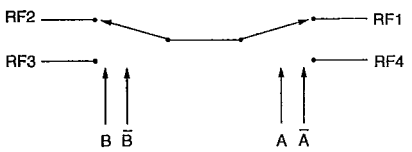
The SW-923 is fabricated with a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

SSOP-20



Dimensions in ( ) are in mm.
Unless Otherwise Noted: .xxx = ± .010 (.xx = ±0.25)
.xx = ± 0.02 (.x = ± 0.5)

Functional Diagram



Ordering Information

Model No.	Package
SW-923 PIN	SSOP 20 Lead

Electrical Specifications, T_A = 25°C

Parameter	Test Conditions		Unit	Min.	Typ.	Max
Insertion Loss		DC – 0.1 GHz	dB		0.55	0.6
		DC – 0.5 GHz	dB		0.65	0.7
		DC – 1.0 GHz	dB		0.7	0.9
		DC – 2.0 GHz	dB		0.9	1.2
Isolation		DC – 0.1 GHz	dB	36	38	
		DC – 0.5 GHz	dB	36	38	
		DC – 1.0 GHz	dB	32	36	
		DC – 2.0 GHz	dB	22	25	
VSWR		DC – 0.1 GHz			1.3:1	
		DC – 0.5 GHz			1.5:1	
		DC – 1.0 GHz			1.5:1	
		DC – 2.0 GHz			2.0:1	
Trise, Tfall	10% to 90% RF, 90% to 10% RF		nS		5	
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF		nS		8	
Transients	In Band		mV		12	
One dB Compression Point	Input Power (5V Supply/Control)	0.9 GHz	dBm		32	
	Input Power (8V Supply/Control)	0.9 GHz	dBm		36	
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	

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 (+V)	-1, +12
Control Voltage (+V)	-1, Vsupply to 0.2V
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C

Notes: 1. Operation of this device above any one of these parameters may cause permanent damage.

IP3 Measurements with Two Tones

F1 = 0.9 GHz, F2 = 0.905 GHz			
Input Power (Each Tone)	Control Voltage	3rd Order Intermodulation Product (dBc)	IP3 (dBm)
+24 dBm	0, +5	-32	+40
	0, +6	-46	+47
	0, +7	-66	+57
	0, +8	-66	+57
+25 dBm	0, +5	-28	+ 39
	0, +6	-38	+44
	0, +7	-56	+53
	0, +8	-65	+57.5
+26 dBm	0, +5	-25	+38.5
	0, +6	-32	+42
	0, +7	-46	+49
	0, +8	-64	+58
+27 dBm	0, +5	-24	+39
	0, +6	-46	+41.5
	0, +7	-66	+45
	0, +8	-66	+50.5
+28 dBm	0, +8	-40	+48
+29 dBm	0, +8	-34	+46
+30 dBm	0, +8	-28	+44

Pin Configuration

Pin No.	Description	Pin No.	Description
1	+V Supply	11	+V Supply
2	GND	12	GND
3	RF1	13	RF3
4	GND	14	GND
5	CTL A	15	CTL B
6	CTL A	16	CTL B
7	GND	17	GND
8	RF4	18	RF2
9	GND	19	GND
10	GND	20	GND

Notes: 1. +V Supply voltage = +3V to +8V: +control voltage = +3V to +8V.
2. The high control voltage must be within ± 0.2V of the supply voltage.
3. The RF ports must be DC blocked outside of the package from ground or any other voltage.

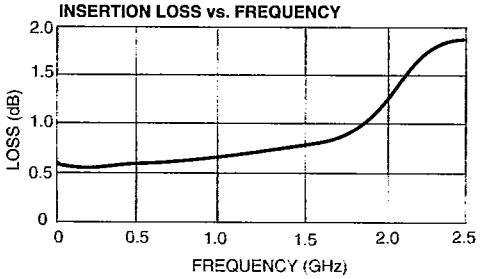
Truth Table

Control Input				RF Port			
A	Ā	B	B̄	RF1	RF2	RF3	RF4
0	1	0	1	ON	ON	OFF	OFF
0	1	1	0	ON	OFF	ON	OFF
1	0	0	1	OFF	ON	OFF	ON
1	0	1	0	OFF	OFF	ON	ON

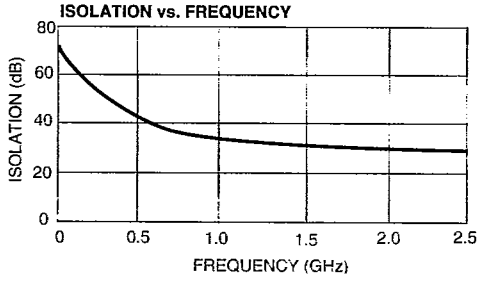
"0" = 0 to 0.2V @ 20 µA Max.
"1" = +3V @ 30 µA Typ. to +10V @ 800 µA Max.

Typical Performances

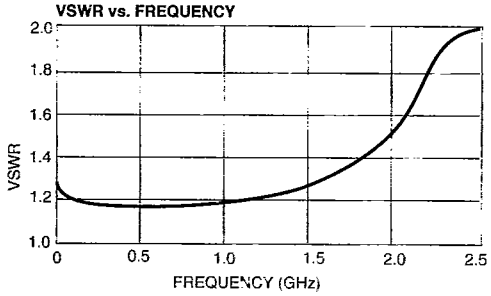
INSERTION LOSS vs. FREQUENCY



ISOLATION vs. FREQUENCY



VSWR vs. FREQUENCY



COMPRESSION vs. CONTROL VOLTAGE (0.9 GHz)