T/R Diversity Switch
DC - 2.5 GHz

SW-923

V 2.00

Features

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

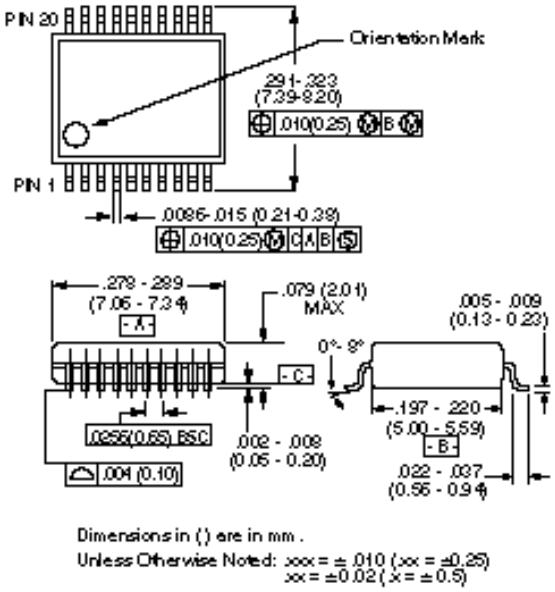
Description

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.

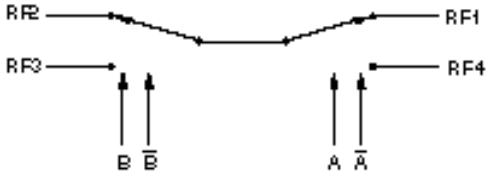
The SW-923 is ideally suited for use where very low power consumption is required.Typical applications include transmit/receive diversity switching in land mobile and portable transceiver applications and other battery powered radio equipment.

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



Functional Diagram



Ordering Information

Part Number	Package
SW-923 PIN	SSOP 20-Lead Plastic Package

Electrical Specifications, T_A = +25°C

Parameter	Test Conditions		Unit	Min.	Typ.	Max
Insertion Loss		DC – 0.1 GHz DC – 0.5 GHz DC – 1.0 GHz DC – 2.0 GHz	dB dB dB dB		0.55 0.65 0.7 0.9	0.6 0.7 0.9 1.2
Isolation		DC – 0.1 GHz DC – 0.5 GHz DC – 1.0 GHz DC – 2.0 GHz	dB dB dB dB	36 36 32 22	38 38 36 25	
VSWR		DC – 0.1 GHz DC – 0.5 GHz DC – 1.0 GHz DC – 2.0 GHz			1.3:1 1.5:1 1.5:1 2.0:1	
Trise, Tfall Ton, Toff Transients	10% to 90% RF, 90% to 10% RF 50% Control to 90% RF, 50% Control to 10% RF In Band		nS nS mV		5 8 12	
One dB Compression	Input Power (5 V Supply/Control) Input Power (8 V Supply/Control)	0.9 GHz 0.9 GHz	dBm dBm		32 36	
IP_3	Measured Relative (5 V Supply/Control) to Input Power (8 V Supply/Control) (for two-tone input power up to +10 dBm)	0.9 GHz 0.9 GHz	dBm dBm		61 65	

V 2.00

Absolute Maximum Ratings[1]

Parameter	Absolute Maximum
Max. Input Power	
0.5 – 2.0 GHz	
5 V Control and Supply	+37 dBm
8 V Control and Supply	+40 dBm
10 V Control and Supply	+42 dBm
Power Dissipation	1.0 W
Supply Voltage (+V)	-1, +12
Control Voltage (+V)	-1, V supply to 0.2 V
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C

1.Operation of this device above any one of these parameters may cause pemanent damage.

IP_3 Measurements with Two Tones

F1 = 0.9 GHz,F2 = 0.905 GHz			
Input Power (Each Tone)	**Control Voltage**	**3rd Order Intermodulation Product (dBc)**	**IP_3 (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 $\overline{B}$
6	CTL $\overline{A}$	16	CTL B
7	GND	17	GND
8	RF4	18	RF2
9	GND	19	GND
10	GND	20	GND

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

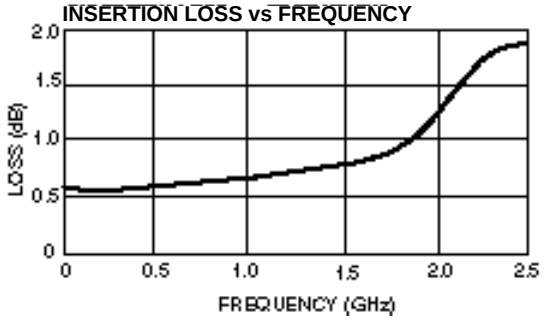
Truth Table

Control Input				RF Port			
A	$\overline{A}$	B	$\overline{B}$	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

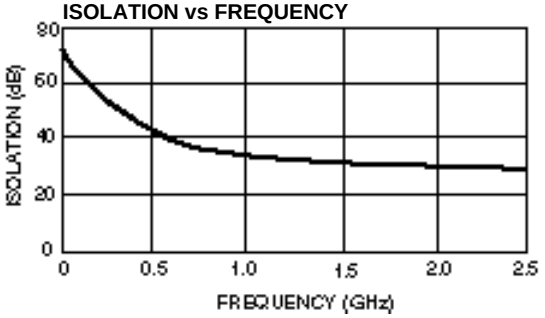
"0" = 0 to 0.2 V @ 20 µA Max.
"1" = +3 V @ 30 µA Typ. to +10 V @ 800 µA Max.

Typical Performance

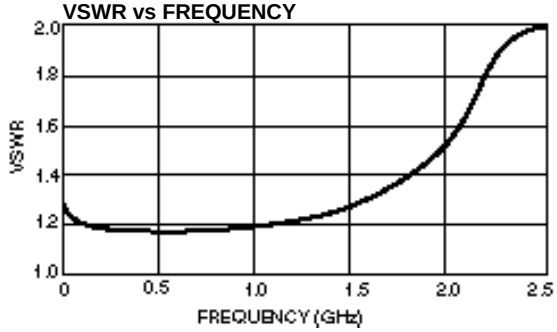
INSERTION LOSS vs FREQUENCY



ISOLATION vs FREQUENCY



VSWR vs FREQUENCY



COMPRESSION vs CONTROL VOLTAGE (0.9 GHz)