

GaAs SP4T Absorptive Switch

DC - 3 GHz

SW-314

V3.00

Features

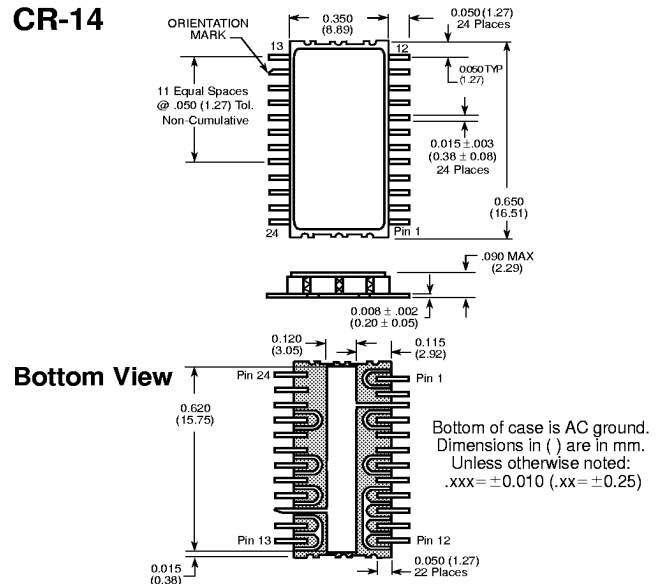
- Integral Silicon Driver
- Isolation: 50dB Typ. at 1 GHz
- Ultra Low DC Power Consumption
- Hermetic Surface Mount Package
- TTL and CMOS Input Compatible
- 50Ω Nominal Impedance

Description

M/A-COM's SW-314 is a GaAs MMIC SP4T absorptive switch with an integral silicon ASIC driver. This device is in a 24 lead ceramic surface mount package. These switches exhibit excellent performance and repeatability from DC to 3 GHz, with very low DC power dissipation. The SW-314 is ideally suited for RF/IF communications applications.

Environmental screening is available. Contact the factory for information.

CR-14



Electrical Specifications, TA = +25°C^{1,2}

Parameter	Test Conditions	Units	Minimum	Typical	Maximum
Reference Insertion Loss	DC - 0.5 GHz	dB			1.3
	DC - 1.0 GHz	dB			1.4
	DC - 2.0 GHz	dB			1.6
	DC - 3.0 GHz	dB			1.8
Isolation	DC - 0.5 GHz	dB	50		
	DC - 1.0 GHz	dB	45		
	DC - 2.0 GHz	dB	35		
	DC - 3.0 GHz	dB	30		
VSWR	DC - 0.5 GHz	RFC, RF1 - RF4 (On)		RF1 - RF4 (Off)	
	DC - 1.0 GHz	1.6:1 Max.		1.3:1 Max.	
	DC - 2.0 GHz	1.6:1 Max.		1.5:1 Max.	
	DC - 3.0 GHz	1.6:1 Max.		1.9:1 Max.	
Trise, Tfall Ton, Toff Transients	10% to 90% 50% Control to 90%/10% RF In-band (peak-peak)	nS nS mV		7 25 20	
1 dB Compression ³	Input Power	0.05 GHz		+20	
	Input Power	0.5 - 3.0 GHz		+27	
Input IP ₃ ³	For two-tone input power up to +5 dBm	0.05 GHz		+35	
		0.5 - 3.0 GHz		+46	
Input IP ₂ ³	For two-tone input power up to +5 dBm	0.05 GHz		+45	
		0.5 - 3.0 GHz		+60	
V _{CC} ⁵		V	4.5	5.0	5.5
V _{EE} ⁵		V	-8.0		-5.0
I _{CC} ⁴	V _{CC} = 4.5 to 5.5 V V _{ctl} = 0 to 0.8 V, or V _{CC} - 2.1 V to V _{CC}	mA			4.0
I _{EE}	V _{EE} = -5.0 to -8.0 V	mA			1.0
V _{ctl}	Logic 0 (TTL)	V	0.0		0.8
V _{ctl}	Logic 1 (TTL)	V	2.0		5.0
Input Leakage Current (Low)	0 to 0.8 V	μA			1.0
Input Leakage Current (High)	2.0 to 5.0 V	μA			1.0

1. All specifications apply when operated with bias voltages of +5V for V_{CC} and -5.0V to -8.0V for V_{EE} and 50Ω impedance at all RF ports unless otherwise specified.

2. For this switch to meet the guaranteed specifications, it is necessary to have a DC return on

either RF1 or RF2. The DC return can be either a 10 KΩ resistor, or an RF choke.

3. V_{EE} = -5V for the typical numbers given.

4. For CMOS control levels, V_{CC} current is 2 μA typ. and V_{EE} current is <100 μA typ.

Specifications Subject to Change Without Notice.

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Absolute Maximum Ratings¹

Parameter	Absolute Maximum
Max. Input Power	
0.05 GHz	+27 dBm
0.5 - 3.0 GHz ²	+34 dBm
Bias Voltages	
V _{CC}	-0.5 to +5.5V
V _{EE}	-8.5V to +0.5V
Control Voltage	-0.5V to V _{CC} +0.5V
Operating Temperature	-55°C to +125°
Storage Temperature	-65°C to +150°C

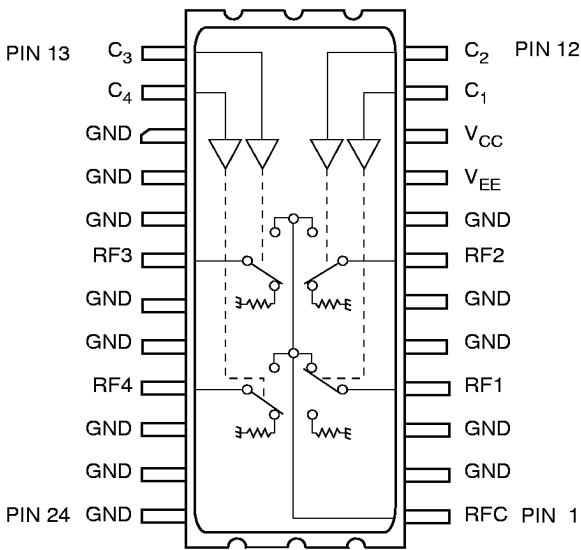
1. Operation of this device above any one of these parameters may cause permanent damage.
2. When the input power is applied to the terminated port, the absolute maximum is +30 dBm.

Truth Table

				Condition of Switch			
TTL Control Inputs				RF Common to Each RF Port			
C1	C2	C3	C4	RF1	RF2	RF3	RF4
1	0	0	0	On	Off	Off	Off
0	1	0	0	Off	On	Off	Off
0	0	1	0	Off	Off	On	Off
0	0	0	1	Off	Off	Off	On

0= TTL Low 1= TTL High

Functional Schematic



Ordering Information⁵

Part No.	Package
SW-314 PIN	Ceramic

5. Contact the factory for standard or custom screening requirements.

Typical Performance @ +25°C

