

GaAs SPDT High Isolation Terminated Switch 0.5 - 2.0 GHz

Rev. V5

Features

- Terminated RF Output
- High Isolation: 35 dB up to 2 GHz
- Positive Control
- Nanosecond Switching Speed
- CMOS Compatible Logic
- SOIC-8 Plastic Package

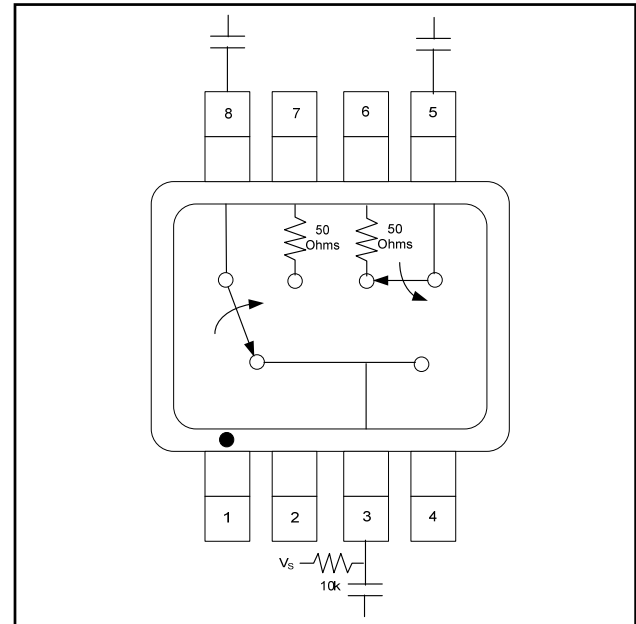
Description

M/A-COM's SW-394 is a GaAs monolithic SPDT terminated switch in a low cost SOIC 8-lead plastic package. The SW-394 is ideally suited for use where low power consumption and high isolation are required.

Typical applications include transmit/receive switching, switch matrices and switched filter banks in systems such as radio and cellular equipment.

The SW-394 is fabricated using a mature 1-micron gate length GaAs MESFET process. The process features full chip passivation for increased performance and reliability.

Functional Schematic



Ordering Information ¹

Part Number	Package
SW-394-PIN	Bulk Packaging
SW-394TR	1000 piece reel
SW-394SMB	Sample Board

1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum
Input Power	+34 dBm
Operating Voltage (V_S , V_A , V_B)	+8.5 Volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- M/A-COM does not recommend sustained operation near these survivability limits.

Pin Configuration ⁴

Pin No.	Function	Pin No.	Function
1	B	5	RF1
2	GND	6	GND
3	RFC	7	GND
4	A	8	RF2

4. Blocking capacitors are required on all RF ports. V_S can be applied at any RF port using 10K or greater pull-up resistor.

Truth Table ^{5,6,7}

Control Input A	Control Input B	RFC-RF2	RFC-RF1
0	1	Off	On
1	0	On	Off

- $0 = 0 \pm 0.2$ VDC
- $1 = +5 \pm 0.2$ VDC,
- $V_S = +5 \pm 0.2$ VDC, 25 μ A Max. Current Total

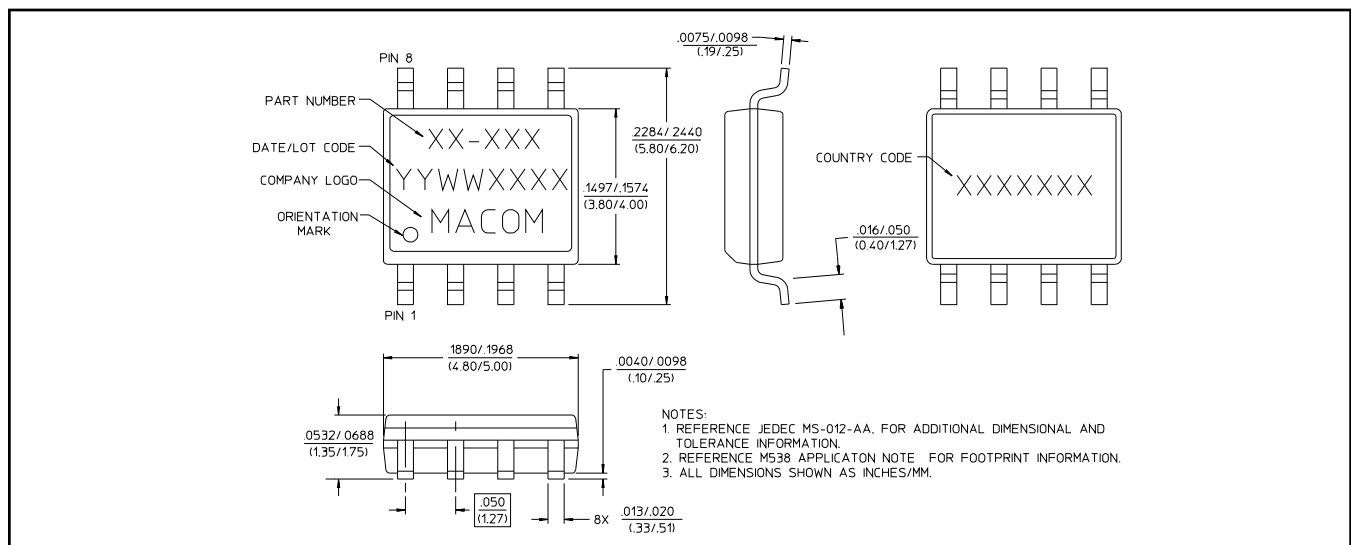
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Electrical Specifications: $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5 - 1.0 GHz	dB	—	1.3	1.5
	1.0 - 2.0 GHz	dB	—	1.4	1.6
Isolation	0.5 - 1.0 GHz	dB	37	40	—
	1.0 - 2.0 GHz	dB	32	35	—
VSWR	0.5 - 1.5 GHz	Ratio	—	1.6:1	—
1 dB Compression	Input Power, +5 V Control/Supply	dBm	—	24	—
	0.5 GHz	dBm	—	24	—
	0.9 GHz	dBm	—	24	—
	1.5 GHz	dBm	—	25	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	—	34	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	ns	—	36	—
Transients	In-Band	mV	—	22	—
Input IP_2	2-Tone, 5 MHz spacing, +10 dBm each	dBm	—	67	—
	0.5 GHz	dBm	—	72	—
	0.9 GHz	dBm	—	72	—
Input IP_3	2-Tone, 5 MHz spacing, +10 dBm each	dBm	—	47	—
	0.5 GHz	dBm	—	47	—
	0.9 GHz	dBm	—	47	—
Control Current	—	μA	—	10	25

SOIC-8[†]



[†]Meets JEDEC moisture sensitivity level 1 requirements.

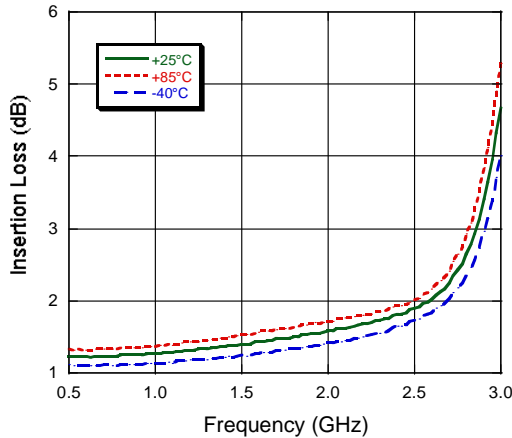
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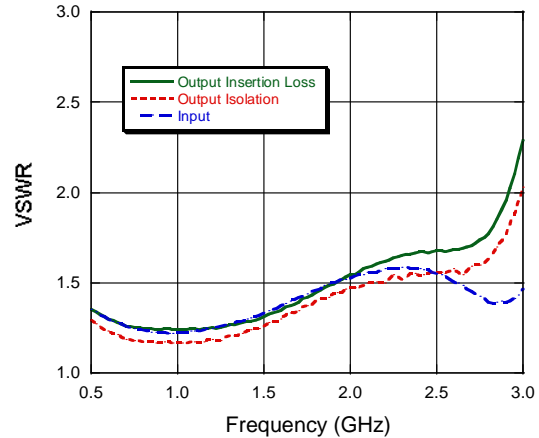
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Typical Performance Curves

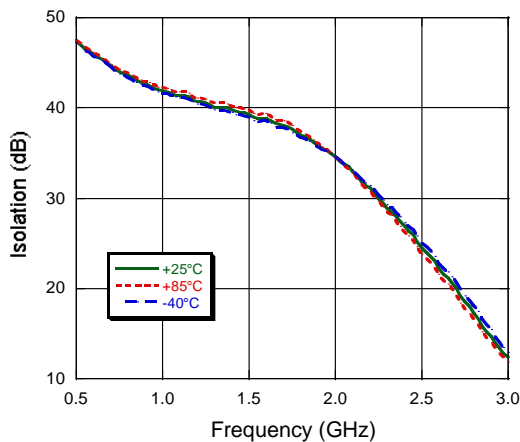
Insertion Loss vs. Frequency



VSWR vs. Frequency



Isolation vs. Frequency



Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.