

GaAs SPST High Isolation Terminated Switch 0.5 - 2.0 GHz

Rev. V4

Features

- Terminated RF Output
- High Isolation: 42 dB up to 2.0 GHz
- Single Positive Control
- CMOS Compatible Logic
- SOIC-8 Plastic Package

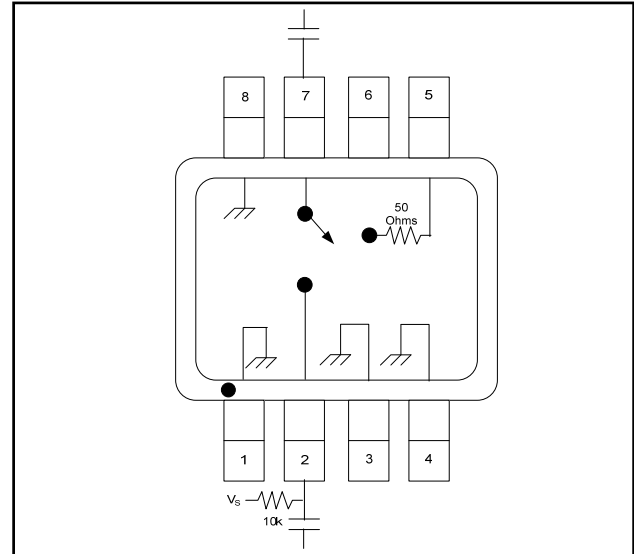
Description

M/A-COM's SW-393 is a GaAs monolithic SPST terminated switch in a low cost SOIC 8-lead plastic package. The SW-393 is ideally suited for use where low power consumption and high isolation are required.

Typical applications include PCS and GSM LO Switching, switch matrices and switched filter banks in systems such as radio and cellular equipment.

The SW-393 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-393-PIN	Bulk Packaging
SW-393TR	1000 piece reel
SW-393SMB	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_{CTL})	+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	GND	5	GND
2	RF1	6	CTL
3	GND	7	RF2
4	GND	8	GND

4. Blocking capacitors are required on all RF ports. V_S can be applied at RF1 or RF2 using 10K or greater pull-up resistors.

Truth Table ^{5,6,7}

Control	RF1 - RF2
0	Off
1	On

- "0" = 0 ± 0.2 VDC
- "1" = $+5 \pm 0.2$ VDC
- $V_S = +5 \pm 0.2$ VDC

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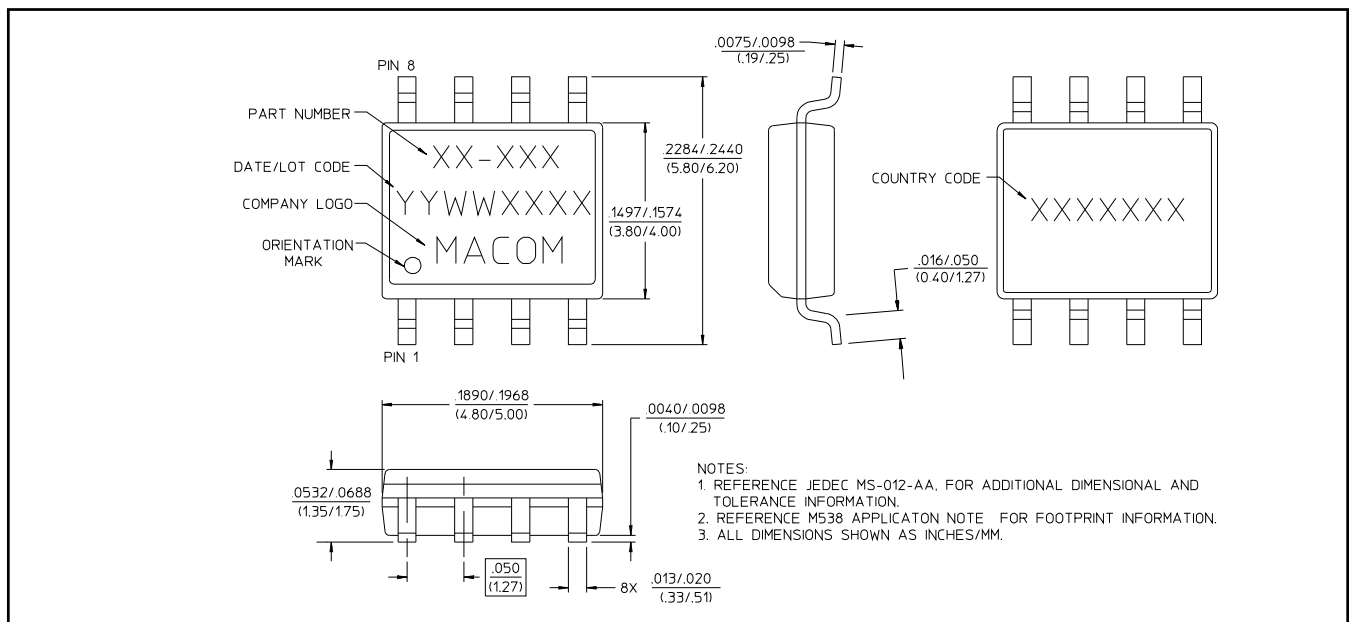
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Electrical Specifications⁸: T_A = 25°C

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5 - 2.0 GHz	dB	—	1.6	1.8
Isolation	0.5 - 1.0 GHz	dB	50	53	—
	1.0 - 2.0 GHz	dB	40	42	—
VSWR	0.5 - 1.5 GHz	Ratio	—	1.5:1	—
	0.5 - 2.0 GHz	Ratio	—	1.7:1	—
1 dB Compression	Input Power, +5 V Control/Supply				
	0.5 GHz	dBm	—	25	—
	0.9 GHz	dBm	—	25	—
	1.5 GHz	dBm	—	26	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	µs	—	2	—
Ton, Toff	50% Control to 90% RF, Control to 10% RF	µs	—	2	—
Transients	In-Band	mV	—	26	—
Input IP ₂	2-Tone, 5 MHz spacing, +10 dBm each				
	0.5 GHz	dBm	—	53	—
	0.9 GHz	dBm	—	58	—
Input IP ₃	2-Tone, 5 MHz spacing, +10 dBm each				
	0.5 GHz	dBm	—	39	—
	0.9 GHz	dBm	—	38	—

8. All measurements taken at 900 MHz in a 50 Ω system unless otherwise specified. Loss varies at 0.003 dB/°C.

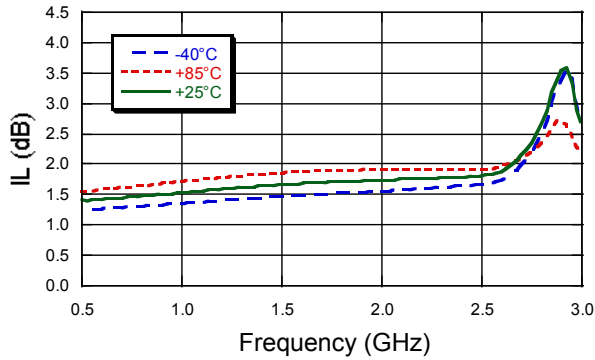
SOIC-8[†]



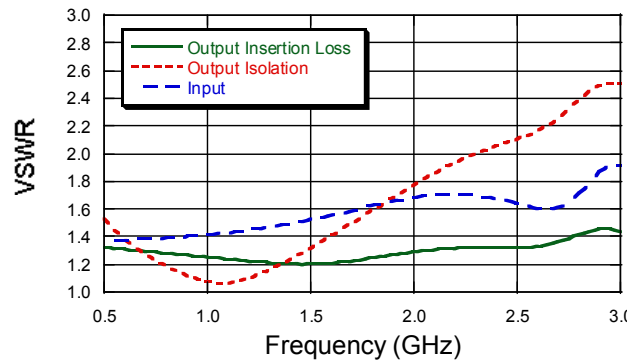
[†]Meets JEDEC moisture sensitivity level 1 requirements.

Typical Performance Curves

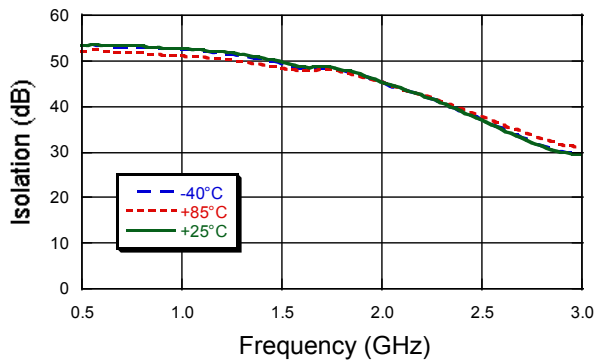
Insertion Loss vs. Frequency



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.