

# GaAs SPST High Isolation Terminated Switch 0.5 - 2.0 GHz

### 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.

### Ordering Information<sup>1</sup>

| 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 <sup>2,3</sup>

| Parameter  | Absolute Maximum |  |  |
|--|------------------|--|--|
| Input Power  | +34 dBm          |  |  |
| Operating Voltage (V <sub>S</sub> , V <sub>CTL</sub> ) | +8.5 Volts       |  |  |
| Operating Temperature                                  | -40°C to +85°C   |  |  |
| Storage Temperature                                    | -65°C to +150°C  |  |  |

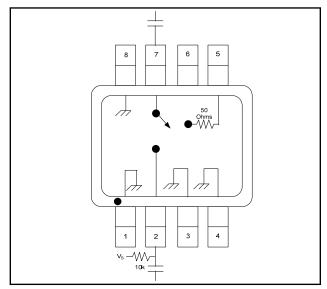
2. Exceeding any one or combination of these limits may cause permanent damage to this device.

3. M/A-COM does not recommend sustained operation near these survivability limits.

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### Rev. V4

### **Functional Schematic**



### Pin Configuration<sup>4</sup>

| 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.  $V_{\rm S}$  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        |  |  |

- 5. "0" = 0 ± 0.2 VDC
- 6. "1" = +5 ± 0.2 VDC
- 7. Vs = +5 ± 0.2 VDC
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<sup>1</sup> 



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Rev. V4

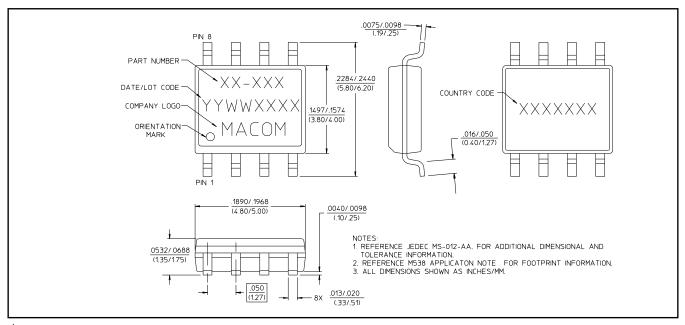
| Electrical Specifications <sup>o</sup> : $T_A = 25^{\circ}C$ |                 |
|--|-----------------|
| Parameter  | Test Conditions |

Q

| Parameter             | Test Conditions   | Units             | Min.     | Тур.           | Max. |
|-----------------------|---|-------------------|----------|----------------|------|
| Insertion Loss        | 0.5 - 2.0 GHz   | dB                | —        | 1.6            | 1.8  |
| Isolation             | 0.5 - 1.0 GHz<br>1.0 - 2.0 GHz                                    | dB<br>dB          | 50<br>40 | 53<br>42       | —    |
| VSWR                  | 0.5 - 1.5 GHz<br>0.5 - 2.0 GHz                                    | Ratio<br>Ratio    | _        | 1.5:1<br>1.7:1 | _    |
| 1 dB Compression      | Input Power, +5 V Control/Supply<br>0.5 GHz<br>0.9 GHz<br>1.5 GHz | dBm<br>dBm<br>dBm |          | 25<br>25<br>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 <sub>2</sub> | 2-Tone, 5 MHz spacing, +10 dBm each<br>0.5 GHz<br>0.9 GHz         | dBm<br>dBm        | _        | 53<br>58       | _    |
| Input IP <sub>3</sub> | 2-Tone, 5 MHz spacing, +10 dBm each<br>0.5 GHz<br>0.9 GHz         | dBm<br>dBm        |          | 39<br>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<sup>†</sup>



<sup>†</sup>Meets JEDEC moisture sensitivity level 1 requirements.

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<sup>2</sup> 

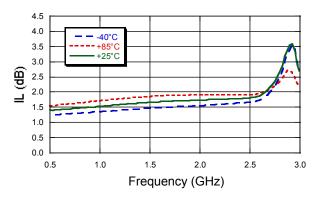


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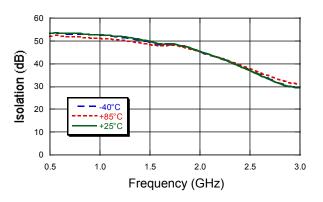
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### **Typical Performance Curves**

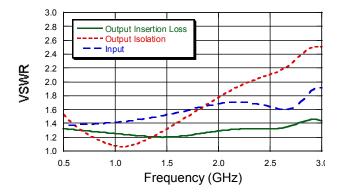
#### Insertion Loss vs. Frequency



Isolation vs. Frequency



#### VSWR 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.

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