

## GaAs SPDT Switch

### 0.05 - 3.0 GHz

Rev. V4

### Features

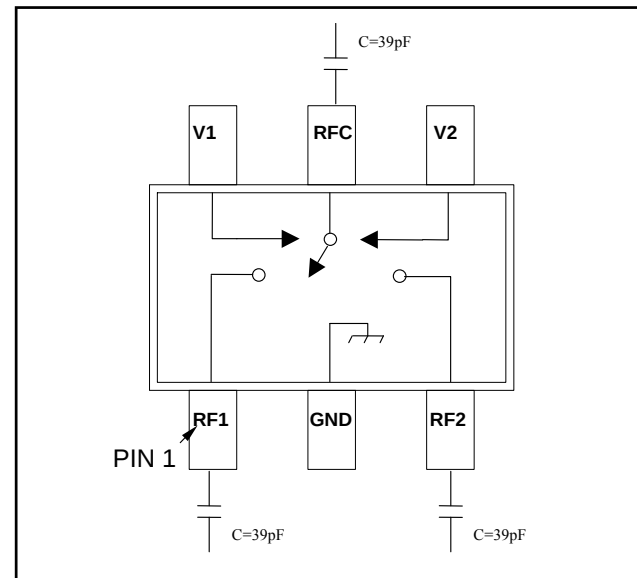
- Low Insertion Loss: 0.3 dB Typ. @ 2.4 GHz
- Isolation: 21 dB @ 2.4 GHz
- Low Power Consumption: <5  $\mu$ A @ +2.3V
- Low Cost Plastic SOT-363 Package

### Description

M/A-COM's SW-485 is a GaAs PHEMT MMIC SPDT switch in a low cost SC-70 (SOT-363) surface mount plastic package. The SW-485 is ideally suited for applications where very small size and low cost are required. Typical applications are dual band systems where switching between small signal components are required such as filter banks, single-band LNAs, converters, etc. This part can be used for low power, low loss requirements in all systems operating up to 3 GHz, including PCS, GSM, DCS, Blue Tooth, and other Rx chain applications.

The SW-485 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

### Functional Schematic



### Pin Configuration

| Pin No. | Function | Description |
|---------|----------|-------------|
| 1       | RF1      | RF Port 1   |
| 2       | GND      | Ground      |
| 3       | RF2      | RF Port 2   |
| 4       | V2       | Control 2   |
| 5       | RFC      | RF Input    |
| 6       | V1       | Control 1   |

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

| Part Number   | Package                           |
|---------------|-----------------------------------|
| SW-485        | Bulk Packaging                    |
| SW-485TR-3000 | 3000 piece reel                   |
| SW-485SMB     | Sample Board (Includes 5 Samples) |

1. Reference Application Note M513 for reel size information.

### Truth Table <sup>2</sup>

| Mode (Control)        | Control V1                  | Control V2                  | RFC-RF1   | RFC-RF2   |
|-----------------------|-----------------------------|-----------------------------|-----------|-----------|
| Positive <sup>2</sup> | 0 $\pm$ 0.2V<br>+2.3 to +5V | +2.3 to +5V<br>0 $\pm$ 0.2V | On<br>Off | Off<br>On |

2. External DC blocking capacitors are required on all RF ports.

### Absolute Maximum Ratings <sup>3</sup>

| Parameter                   | Absolute Maximum |
|-----------------------------|------------------|
| Input Power (0.5 - 3.0 GHz) | +32 dBm          |
| 3 V Control                 | +34 dBm          |
| 5 V Control                 | +34 dBm          |
| Operating Voltage           | +8.5 volts       |
| Operating Temperature       | -40°C to +85°C   |
| Storage Temperature         | -65°C to +150°C  |

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

## GaAs SPDT Switch

### 0.05 - 3.0 GHz

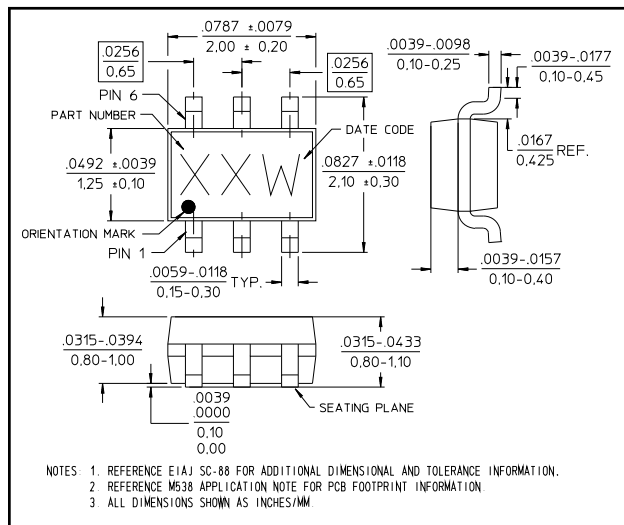
Rev. V4

### Electrical Specifications: $T_A = 25^\circ\text{C}$ , $Z_0 = 50\ \Omega$ <sup>4</sup>

| Parameter      | Test Conditions                         | Units | Min | Typ   | Max   |
|----------------|-----------------------------------------|-------|-----|-------|-------|
| Insertion Loss | 0.05 - 1.0 GHz                          | dB    | —   | 0.25  | 0.40  |
|                | 0.05 - 3.0 GHz                          | dB    | —   | 0.35  | 0.55  |
| Isolation      | 0.05 - 1.0 GHz                          | dB    | 20  | 23    | —     |
|                | 0.05 - 3.0 GHz                          | dB    | 20  | 21    | —     |
| VSWR           | 0.05 - 3.0 GHz                          | Ratio | —   | 1.1:1 | 1.2:1 |
| IP2            | Two Tone +5 dBm, 5 MHz Spacing, >50 MHz | dBm   | —   | 90    | —     |
| IP3            | Two Tone +5 dBm, 5 MHz Spacing, >50 MHz | dBm   | —   | 46    | —     |
| P1dB           | $V_c = 0.2\text{V}/2.5\text{V}$         | dBm   | —   | 21    | —     |
|                | $V_c = 0.2\text{V}/3.0\text{V}$         | dBm   | —   | 25    | —     |
| Trise, Tfall   | 10% to 90% RF and 90% to 10% RF         | nS    | —   | 35    | —     |
| Ton, Toff      | —                                       | nS    | —   | 40    | —     |
| Transients     | —                                       | mV    | —   | 10    | —     |

4. Insertion loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz - 1 GHz, 39 pF for 0.5 GHz - 3 GHz.

### SC-70 (SOT-363) Plastic Package



### Handling Procedures

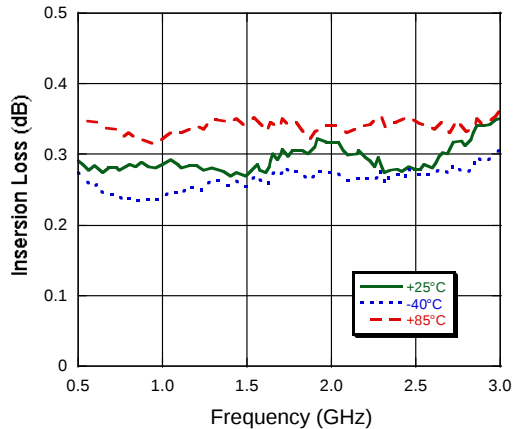
Please observe the following precautions to avoid damage:

### Static Sensitivity

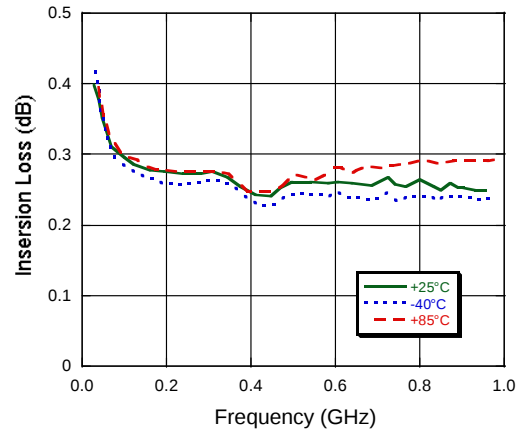
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

## Typical Performance Curves

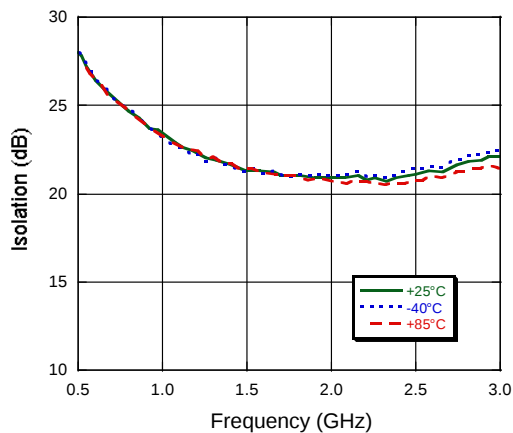
**Insertion Loss, 39 pF**



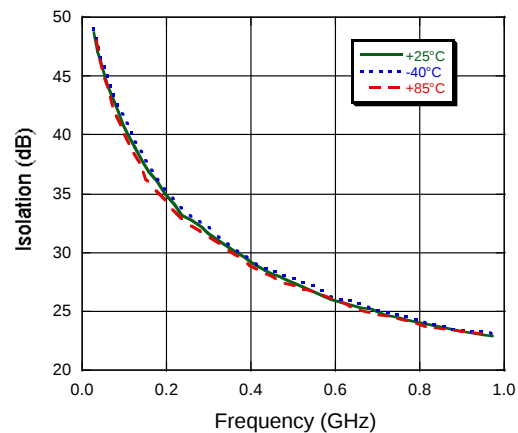
**Insertion Loss, 1000 pF**



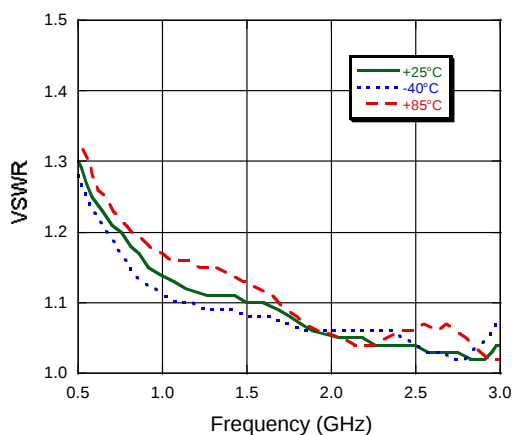
**Isolation, 39 pF**



**Isolation, 1000 pF**



**VSWR, 39 pF**



**VSWR, 1000 pF**

