

**GaAs High Isolation Switch
DC - 3.0 GHz**

**SW-439
V3**

Features

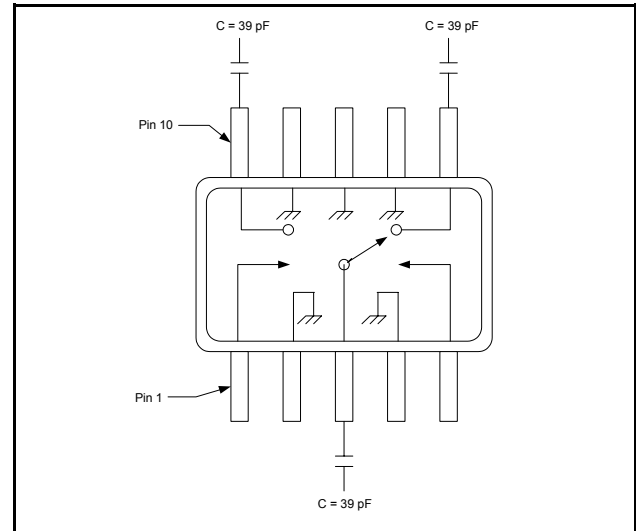
- Low Power Consumption: < 15 μ A @ +2.5V
- High Isolation: 50 dB Typical @ 2 GHz
- Low Insertion Loss: 0.7 dB @ 2 GHz
- Positive 2.5 to 5 V Control
- Low Cost Plastic MSOP-10 Package

Description

M/A-COM's SW-439 is a GaAs MMIC SPDT switch in a low cost MSOP-10 surface mount plastic package. This part is ideal for high isolation, broadband switching requirements. Typical applications include synthesizer switching, transmit/receive switching, switch matrices and filter banks in systems such as radio and cellular equipment, PCM, GPS, and fiber optic modules.

The SW-439 is fabricated as a monolithic GaAs MMIC using a 0.5 micron PHEMT process. The process features full passivation.

Functional Schematic ³



3. For improved performance at frequencies below 500 MHz, use larger value capacitors.

Ordering Information

| Part Number | Package |
|-------------|-----------------|
| SW-439 | Bulk Packaging |
| SW-439TR | 1000 piece reel |
| SW-439SMB | Sample Board |

Note: Reference Application Note M513 for reel size information.

Pin Configuration

| Pin No. | Function | Pin No. | Function |
|---------|-----------|---------|-----------|
| 1 | Control 1 | 6 | RF Port 2 |
| 2 | Ground | 7 | Ground |
| 3 | RF Input | 8 | Ground |
| 4 | Ground | 9 | Ground |
| 5 | Control 2 | 10 | RF Port 1 |

Absolute Maximum Ratings ^{1,2}

| Parameter | Absolute Maximum |
|-----------------------|------------------|
| Input Power | +30 dBm |
| Operating Voltage | +8.5 Volts |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |

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

Truth Table ^{4,5}

| Control V1 | Control V2 | RFC - RF1 | RFC - RF2 |
|------------|------------|-----------|-----------|
| 0 | 1 | Off | On |
| 1 | 0 | On | Off |

4. External DC blocking capacitors are required on all RF ports.
5. "0" = 0 ± 0.2 Vdc, "1" = +2.5 to +5 Vdc

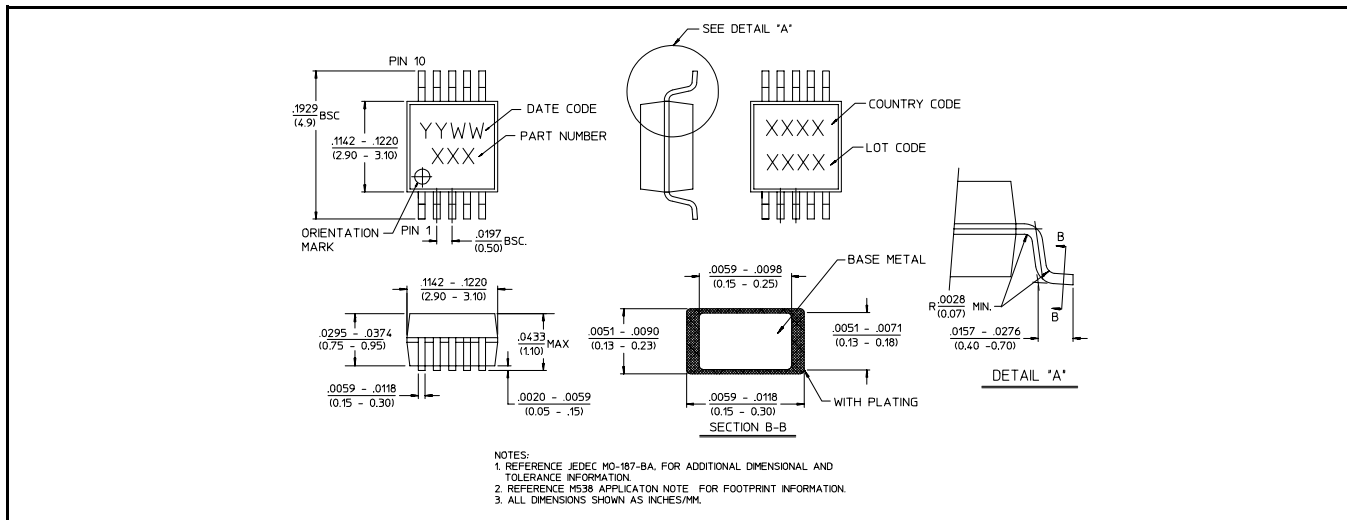
**GaAs High Isolation Switch
DC - 3.0 GHz**

**SW-439
V3**

Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_C = 0 / 3 \text{ V}$, $Z_0 = 50\Omega$

| Parameter | Test Conditions | Units | Min | Typ | Max |
|-----------------|---|---------------|-----|-------|-------|
| Insertion Loss | DC - 1.0 GHz | dB | — | 0.55 | 0.65 |
| | 1.0 - 2.0 GHz | dB | — | 0.65 | 0.75 |
| | 2.0 - 3.0 GHz | dB | — | 0.80 | 0.90 |
| Isolation | DC - 2.0 GHz | dB | 45 | 47 | — |
| | 2.0 - 3.0 GHz | dB | 31 | 33 | — |
| VSWR | 0.25 - 3.0 GHz | Ratio | — | 1.2:1 | 1.3:1 |
| P1dB | 500 MHz - 2.0 GHz, $V_C = 2.5 \text{ V}$ | dBm | — | 20 | — |
| P1dB | 500 MHz - 2.0 GHz, $V_C = 5 \text{ V}$ | dBm | — | 28 | — |
| IP2 | 2 Tone, 900 MHz, 5 MHz Spacing, $V_C = 3 \text{ V}$ | dBm | — | 85 | — |
| IP3 | 2 Tone, 900 MHz, 5 MHz Spacing, $V_C = 3 \text{ V}$ | dBm | — | 50 | — |
| Ton, Toff | 50% Control to 90% RF, 50% Control to 10% RF | nS | — | 20 | — |
| Trise, Tfall | 10% to 90% RF, 90% to 10% RF | nS | — | 10 | — |
| Transients | In-band | mV | — | 15 | — |
| Control Current | $ V_C = 2.5 \text{ V}$ | μA | — | 5 | 15 |

MSOP-10



Handling Procedures

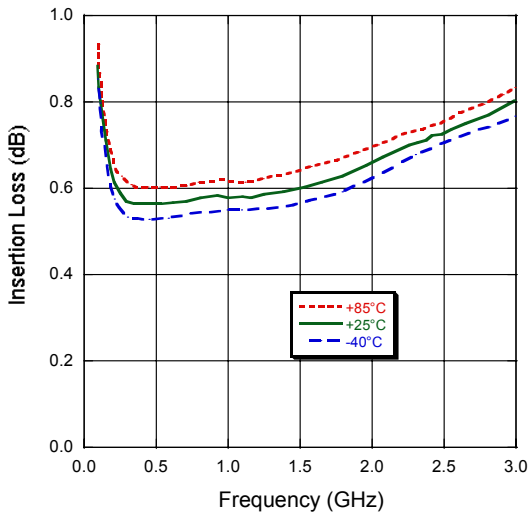
Please observe the following precautions to avoid damage:

Static Sensitivity

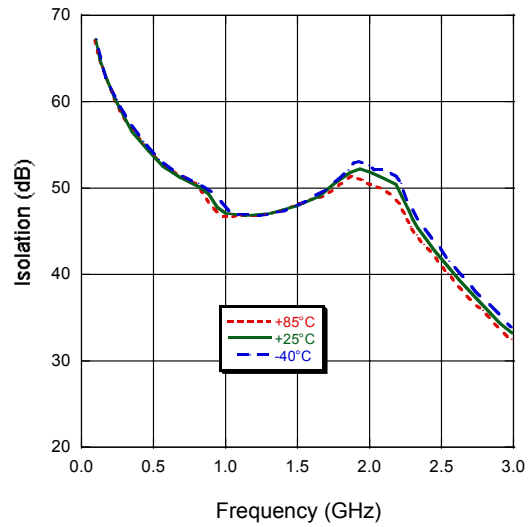
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Typical Performance Curves

Insertion Loss



Isolation



VSWR

