tyco Electronics

MACOM

# GaAs SPDT Switch
# 0.05 - 3 GHz

**MASWSS0005**
**V4**

## Features

- Low Insertion Loss: 0.35 dB @ 2.4 GHz
- Moderate Isolation: 21 dB @ 2.4 GHz
- Low Current Consumption: 5 µA @ 2.5 V
- Low Cost Plastic SOT-26 Package

## Description

M/A-COM's MASWSS0005 is a GaAs PHEMT MMIC single pole, double throw (SPDT) switch in a low cost SOT-26 surface mount plastic package. The MASWSS0005 is ideally suited for applications where small size and low cost are required.

Typical applications are dual band systems which require switching between small signal components 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, Satellite Radio, Blue Tooth, and other receive chain applications.

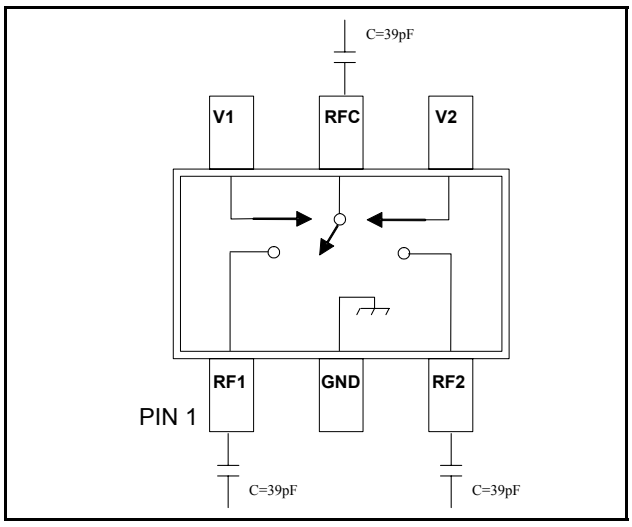
The MASWSS0005 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

## Ordering Information

| Part Number | Package |
|---|---|
| MASWSS0005 | Bulk Packaging |
| MASWSS0005TR-3000 | 3000 piece reel |
| MASWSS0005SMB | Sample Board |

Note: Reference Application Note M513 for reel size information.

## 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 |

## Absolute Maximum Ratings[1,2]

| Parameter | Absolute Maximum |
|---|---|
| Input Power @ 2.5 V Control | +26 dBm |
| Operating Voltage | +8.5 V |
| 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.



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## Electrical Specifications: $T_A$ = 25°C, Vc = 0 V / +2.5 V, $Z_0$ = 50 Ohms[3,4]

| Parameter | Test Conditions | Units | Min | Typ | Max |
|---|---|---|---|---|---|
| Insertion Loss | 0.05 - 1.0 GHz<br>1.0 - 3.0 GHz | dB<br>dB | —<br>— | 0.3<br>0.35 | 0.4<br>0.55 |
| Isolation | 0.05 - 1.0 GHz<br>1.0 - 3.0 GHz | dB<br>dB | 20<br>— | 24<br>21 | —<br>— |
| Return Loss | 0.05 - 3.0 GHz | dB | — | 20 | — |
| IP2 | Two Tone +5 dBm, 5 MHz Spacing | dBm | — | 62 | — |
| IP3 | Two Tone +5 dBm, 5 MHz Spacing | dBm | — | 45 | — |
| P1dB | — | dBm | — | 21 | — |
| Trise, Tfall | 10% to 90% RF and 90% to 10% RF | nS | — | 35 | — |
| Ton, Toff | 50% Vc to 10% RF, 50% Vc to 90% RF | nS | — | 40 | — |
| Transients | In-Band | mV | — | 10 | — |
| Control Current | \|Vc\| = 2.5 V | µA | — | 5 | 20 |

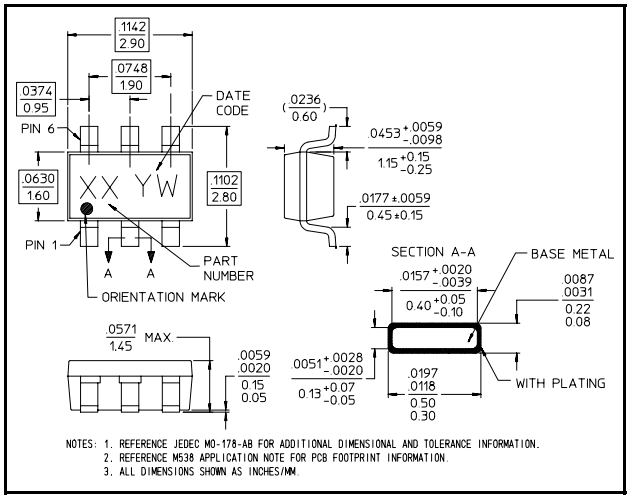
3. For positive voltage control, external DC blocking capacitors are required on all RF ports.
4. Insertion loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz - 1 GHz, 39 pF for 0.5 GHz - 3 GHz.

## Truth Table[5]

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

5. 0 = 0 V to 0.2 V, 1 = +2.5 V to 5 V

## SOT-26




## 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.



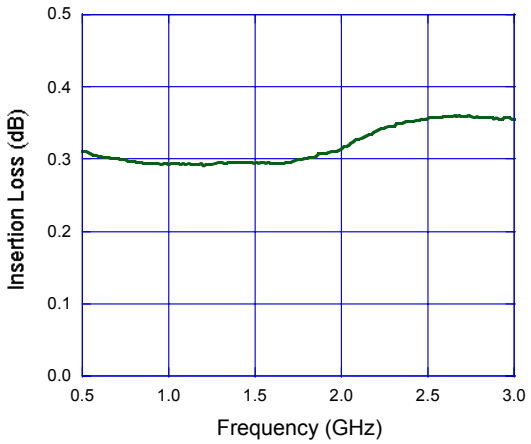
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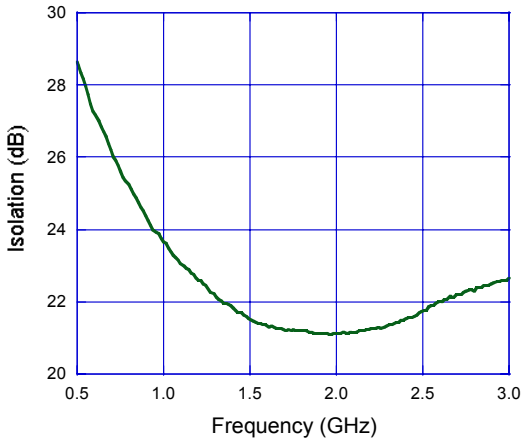
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## Typical Performance Curves

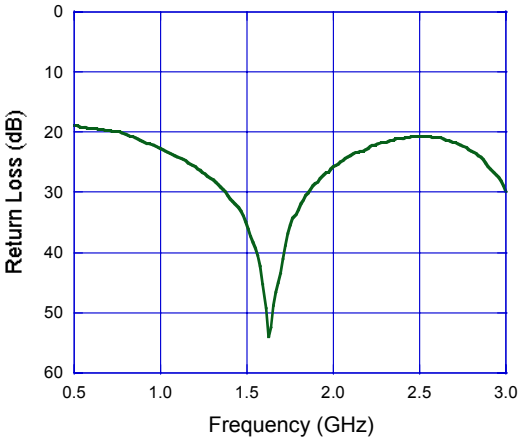
### *Insertion Loss*




### *Isolation*




### *Return Loss*






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