

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 μ A @ 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.

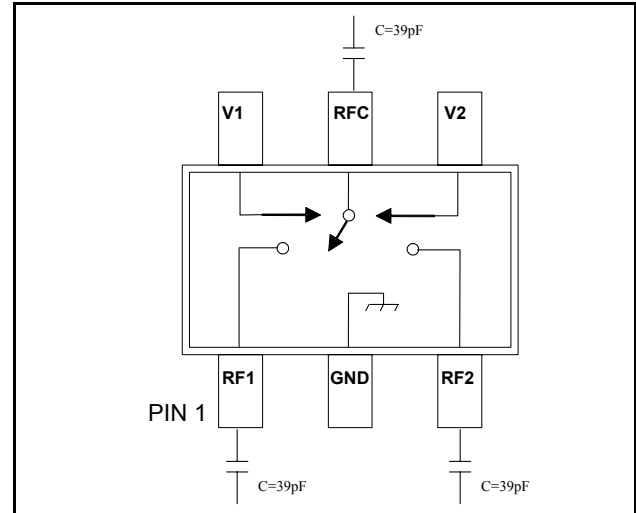
The MASWSS0005 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

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: $T_A = 25^\circ\text{C}$, $V_c = 0\text{ V} / +2.5\text{ V}$, $Z_0 = 50\text{ Ohms}$ ^{3,4}

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	0.05 - 1.0 GHz	dB	—	0.3	0.4
	1.0 - 3.0 GHz	dB	—	0.35	0.55
Isolation	0.05 - 1.0 GHz	dB	20	24	—
	1.0 - 3.0 GHz	dB	—	21	—
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	$ V_c = 2.5\text{ 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 Table⁵

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

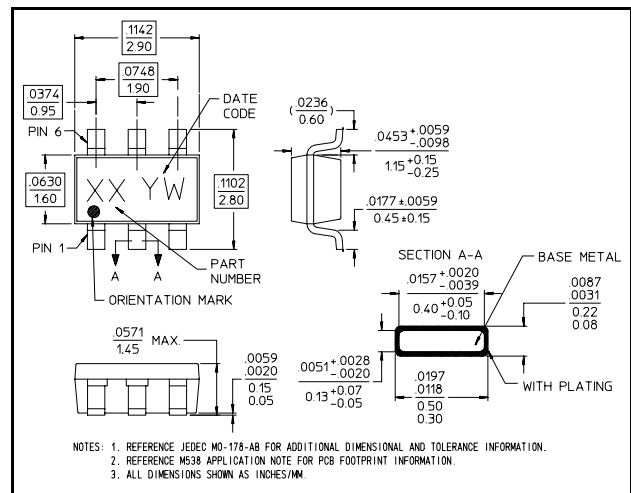
Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

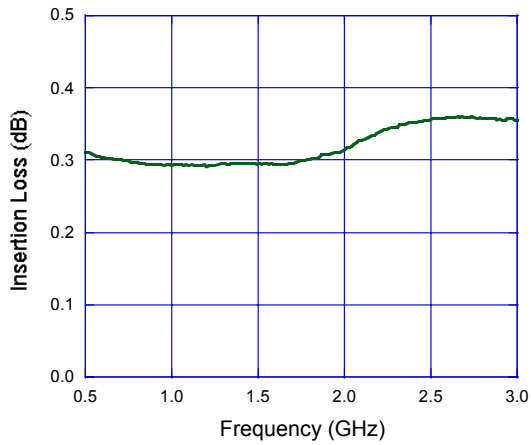
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

SOT-26

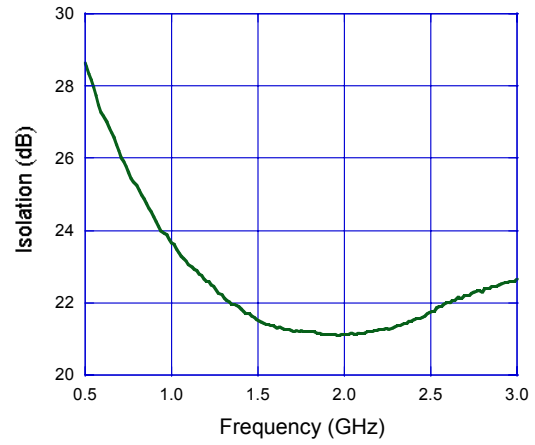


Typical Performance Curves

Insertion Loss



Isolation



Return Loss

