MASWSS0176

GaAs SPDT Switch
0.05 - 3 GHz

Rev. V1

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
- Lead-Free SOT-26 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of MASWSS0005

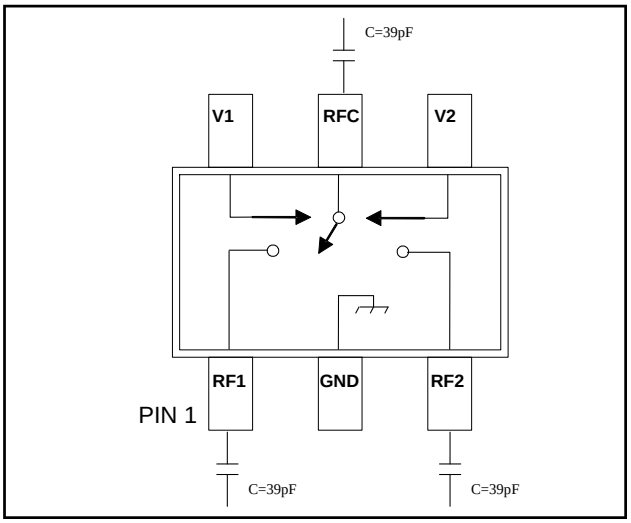
Description

M/A-COM's MASWSS0176 is a GaAs PHEMT MMIC single pole, double throw (SPDT) switch in a low cost, lead-free SOT-26 surface mount plastic package. The MASWSS0176 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 MASWSS0176 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 [1]

Part Number	Package
MASWSS0176	Bulk Packaging
MASWSS0176TR-3000	3000 piece reel
MASWSS0176SMB	Sample Board

1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings [2,3]

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

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.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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Electrical Specifications: T_A = 25°C, Vc = 0 V / +2.5 V, Z_0 = 50 Ohms [4,5]

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	0.05 - 1.0 GHz 1.0 - 3.0 GHz	dB dB	— —	0.3 0.35	0.4 0.55
Isolation	0.05 - 1.0 GHz 1.0 - 3.0 GHz	dB dB	20 —	24 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	|Vc| = 2.5 V	µA	—	5	20

4. For positive voltage control, external DC blocking capacitors are required on all RF ports.
5. 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 [6]

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

6. 0 = 0 V to 0.2 V, 1 = +2.5 V to 5 V

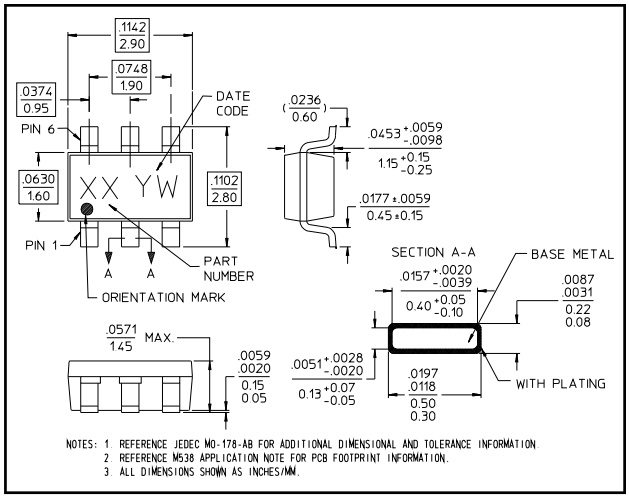
Handling Procedures

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.

Lead-Free SOT-26†



† Reference Application Note M538 for lead-free solder reflow recommendations.

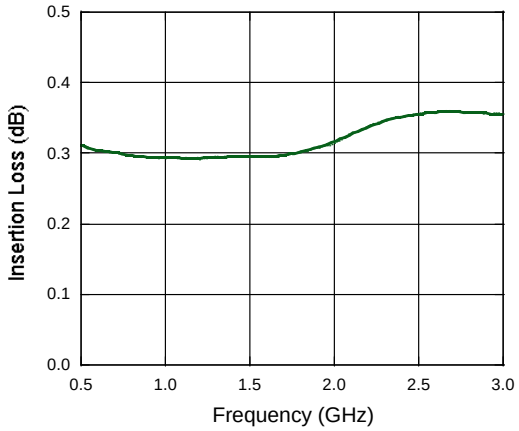
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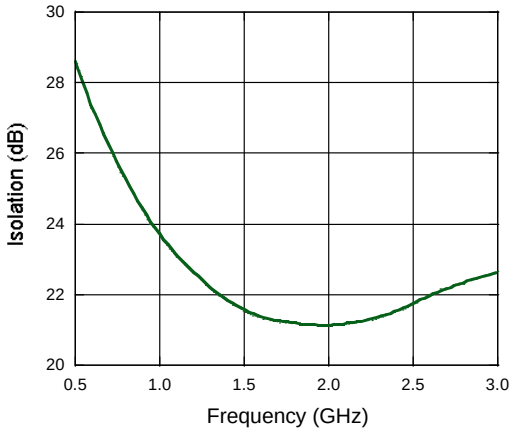
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Typical Performance Curves

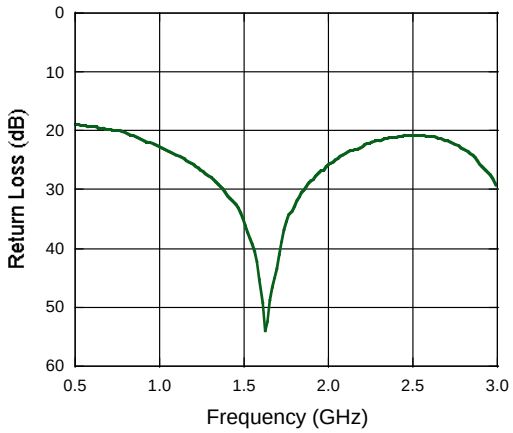
Insertion Loss



Isolation



Return Loss



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