MASW-008075

GaAs SPDT Switch
DC - 3.0 GHz

Rev. V1

Features

- Low Insertion Loss: 0.4 dB @ 2.4 GHz
- Moderate Isolation: 25 dB @ 2.4 GHz
- Low Power Consumption: 5 µA @ +3.0 V
- Lead-Free SC-70 (SOT-363) Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MASW-008075 is a GaAs PHEMT MMIC SPDT switch in a lead-free SC-70 (SOT-363) surface mount plastic package. The MASW-008075 is ideally suited for applications where very small size and low cost are required.

Typical applications are transmit / receive (Tx / Rx) switching in linear systems such as WLAN 802.11b/g. Other applications include 1.9 GHz and 2.4 GHz DECT and linear systems operating up to 3.0 GHz.

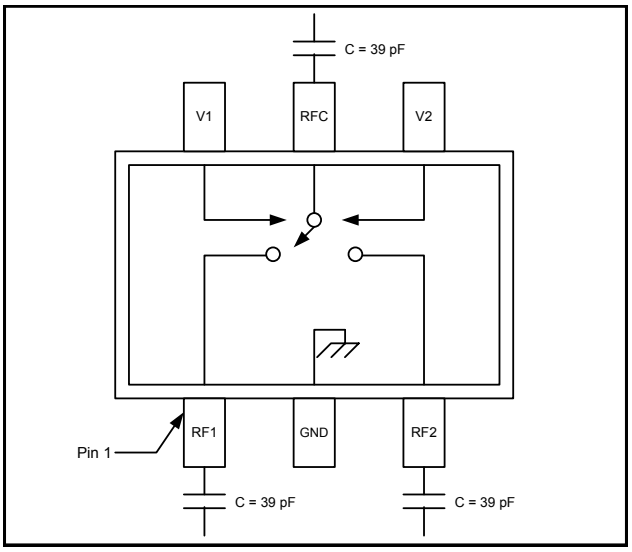
The MASW-008075 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information [1]

Part Number	Package
MASW-008075-000000	Bulk packaging
MASW-008075-TR3000	3000 piece reel
MASW-008075-001SMB	Sample Board

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Pin Name	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 [2,3]

Parameter	Absolute Maximum
Input Power (0.5 - 3.0 GHz) 3 V Control	+30 dBm
Voltage	-8.5 V ≤ Vc ≤ +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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Electrical Specifications: T_A = 25°C, V_C = 0 V / 3 V, Z_0 = 50 Ω [4]

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss[5]	1.0 GHz 2.4 GHz	dB dB	— —	0.3 0.4	— 0.5
Isolation	1.0 GHz 2.4 GHz	dB dB	— 23	23 25	— —
VSWR	0.05 - 3.0 GHz	Ratio	—	1.2:1	—
IIP2	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm	—	80	—
IIP3	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm	—	48	—
Input P1dB	—	dBm	—	28	—
Trise, Tfall	10% to 90% RF and 90% to 10% RF	nS	—	35	—
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	nS	—	40	—
Transients	—	mV	—	10	—
Current	V_C = 3.0 V	µA	—	5	10

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 – 1.0 GHz, 39 pF for 0.5 - 3.0 GHz.

Truth Table [6,7]

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

6. Differential voltage, V (state 1) - V (state 0), must be +2.3 V minimum and must not exceed 8.5 V.
7. 0 = 0 V ± 0.2 V, 1 = +2.5 V to 5.0 V

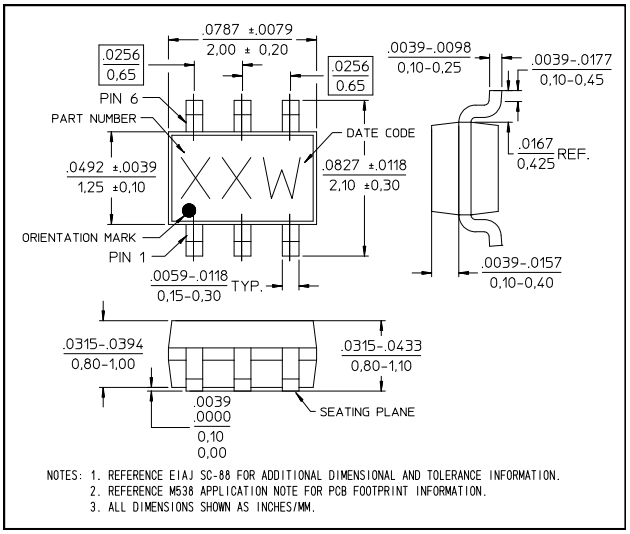
Handling Procedures

The following precautions should be observed 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 SC-70 (SOT-363)†



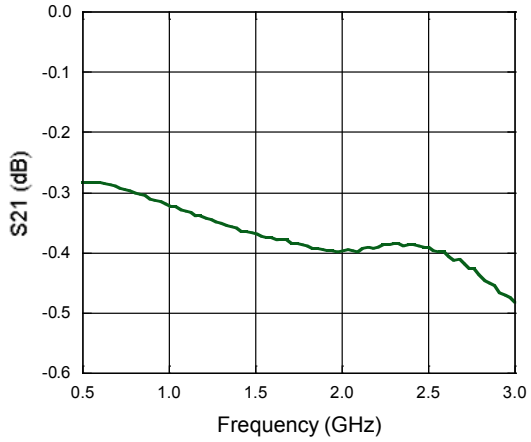
† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

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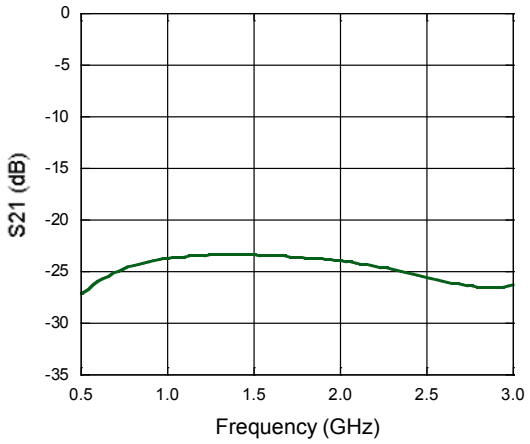
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Typical Performance Curves

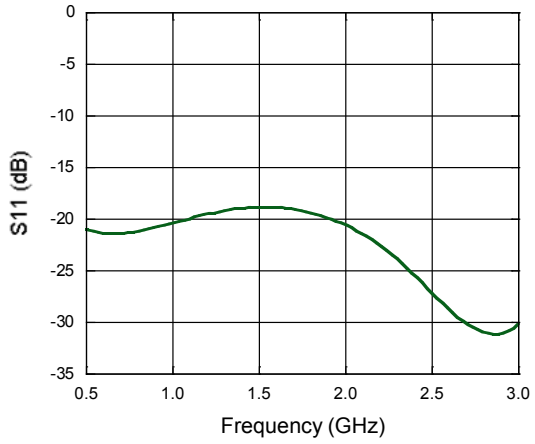
Insertion Loss



Isolation



Return Loss



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