MASWSS0070

GaAs Broadband SPDT Switch
DC - 6.0 GHz

Rev. V4

Features

- 802.11a + b/g Dual Band Applications
- Broadband Performance: DC - 6.0 GHz
- Low Insertion Loss: 0.75 dB @ 5.8 GHz
- High Isolation: 22 dB @ 5.8 GHz
- Low Cost 3 mm 12-Lead PQFN Package
- Fast Switching Speed: 0.5 µm GaAs PHEMT

Description

M/A-COM's MASWSS0070 is a broadband GaAs PHEMT MMIC SPDT switch available in a low cost 3 mm 12-lead PQFN package. The MASWSS0070 is ideally suited for applications where very small size and low cost are required.

Typical applications are for WLAN IEEE 802.11a and 802.11b/g PC cards and access points. Other applications include cordless phones and base stations. Designed for high power, this SPDT switch maintains high linearity up to 6.0 GHz.

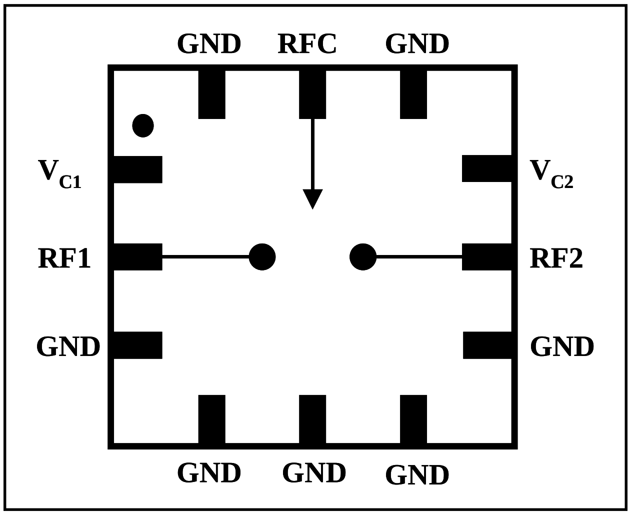
The MASWSS0070 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information [1]

Part Number	Package
MASWSS0070	Bulk Packaging
MASWSS0070TR	7 inch, 1000 piece reel
MASWSS0070TR-3000	13 inch, 3000 piece reel
MASWSS0070SMB	Sample Test Board (Includes 5 Samples)

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description
1	V_{C1}	Control 1
2	RF1	RF Port
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	RF2	RF Port
9	V_{C2}	Control 2
10	GND	Ground
11	RFC	RF Port
12	GND	Ground
13	Paddle[2]	RF and DC Ground

2. The exposed pad centered on the package bottom must be connected to RF and DC ground.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macomtech.com for additional data sheets and product information.

Electrical Specifications: T_A = 25°C, Z_0 = 50 Ω, V_C = 0 V / 3 V, 8 pF Capacitor [3]

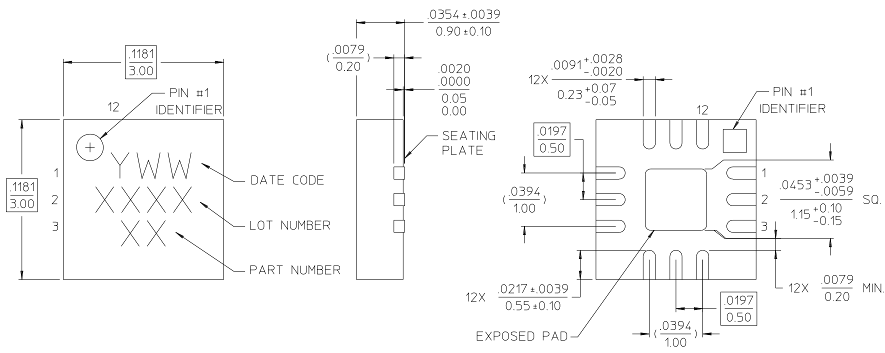
Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss [4]	2 - 3 GHz 3 - 4 GHz 4 - 5 GHz 5 - 6 GHz	dB dB dB dB	— — — —	0.55 0.55 0.65 0.75	0.9 0.9 1.0 1.1
Isolation	2 - 6 GHz	dB	22	25	—
Return Loss	DC - 6 GHz	dB	—	20	—
IIP2	Two Tone, +5 dBm / Tone, 5 MHz Spacing V_C = 0.0 V/3 V @ 2.4 GHz V_C = 0.0 V/3 V @ 5.8 GHz V_C = 0.0 V/5 V @ 2.4 GHz V_C = 0.0 V/5 V @ 5.8 GHz	 dBm dBm dBm dBm	 — — — —	 91 81 99 91	 — — — —
IIP3	Two Tone, +5 dBm / Tone, 5 MHz Spacing V_C = 0.0 V/3 V @ 2.4 GHz V_C = 0.0 V/3 V @ 5.8 GHz V_C = 0.0 V/5 V @ 2.4 GHz V_C = 0.0 V/5 V @ 5.8 GHz	 dBm dBm dBm dBm	 — — — —	 52 50 53 51	 — — — —
Input P-1dB	V_C = 0.0 V/3 V @ 2.4 GHz V_C = 0.0 V/3 V @ 5.8 GHz V_C = 0.0 V/5 V @ 2.4 GHz V_C = 0.0 V/5 V @ 5.8 GHz	dBm dBm dBm dBm	— — — —	32 29 37 35	— — — —
2nd Harmonic	2.4 GHz, P_{IN} = +20 dBm 5.3 GHz, P_{IN} = +20 dBm 5.8 GHz, P_{IN} = +20 dBm	dBc dBc dBc	— — —	-88 -91 -77	— — —
3rd Harmonic	2.4 GHz, P_{IN} = +20 dBm 5.3 GHz, P_{IN} = +20 dBm 5.8 GHz, P_{IN} = +20 dBm	dBc dBc dBc	— — —	-87 -81 -85	— — —
T-rise, T-fall	10% to 90% RF and 90% to 10% RF	nS	—	13	—
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	nS	—	35	—
Transients		mV	—	14	—
Control Current	$\|V_C\|$ = 3 V	mA	—	10	25

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.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

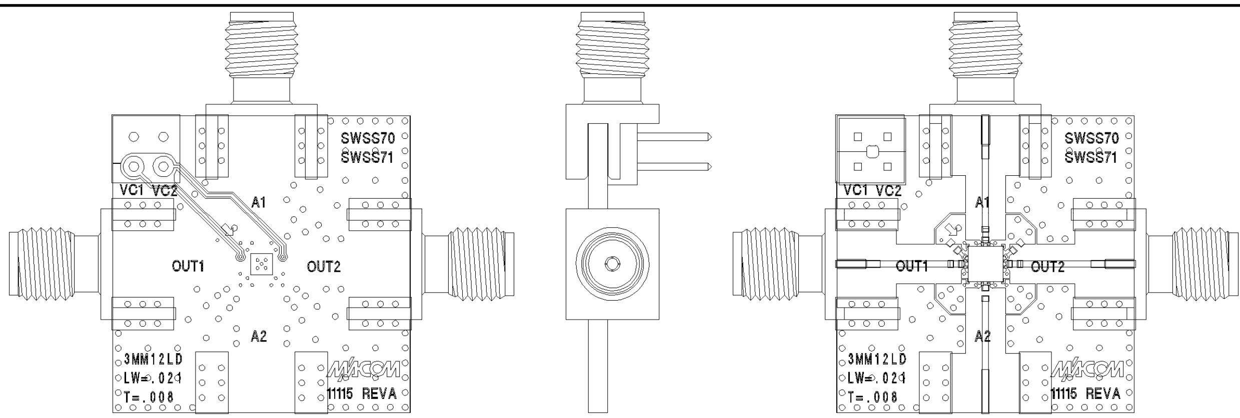
Visit www.macomtech.com for additional data sheets and product information.

3 mm 12-Lead PQFN

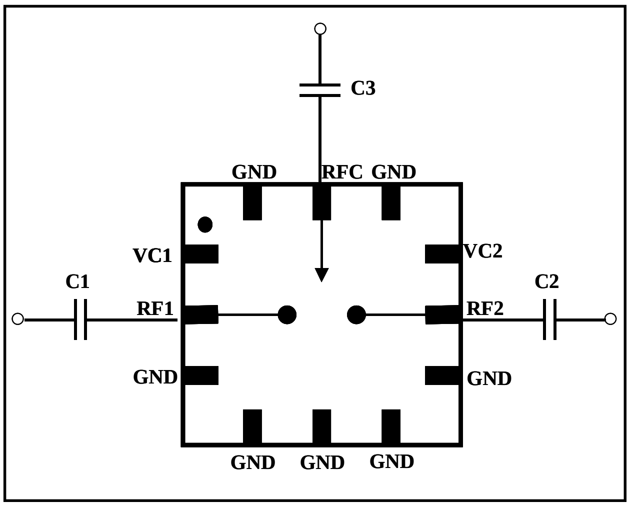


NOTES: 1. REFERENCE JEDEC MO-220, VAR. VEED-1 FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFERENCE S2083 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

Evaluation Board



Application Schematic



Absolute Maximum Ratings [6,7]

Parameter	Absolute Maximum
Input Power @ 3 V Control	+32 dBm
Input Power @ 5 V Control	+34 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

Application #1:
Optimized for 802.11a (5-6 Ghz)

Qty	Description
3	Capacitor, 3.0 pF, 0402, SMT, 5% (C1-C3)

Application #2:
Optimized for 802.11b/g (2.4 GHz)

Qty	Description
3	Capacitor, 8.0 pF, 0402, SMT, 5% (C1-C3)

Truth Table [5]

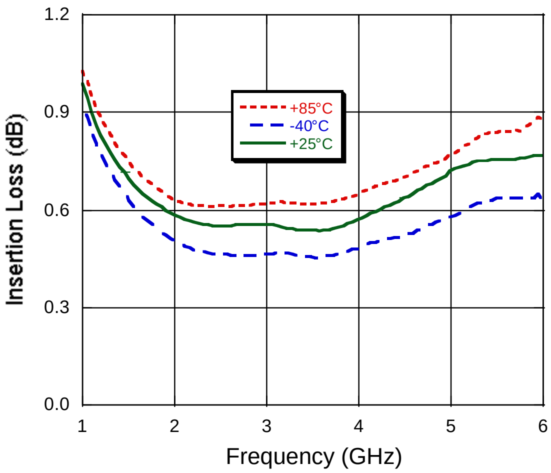
Control V1	Control V2	RFC– RF1	RFC—RF2
1	0	On	Off
0	1	Off	On

5. 1 = +2.9 V to +5 V, 0 = 0 V ± 0.2 V.

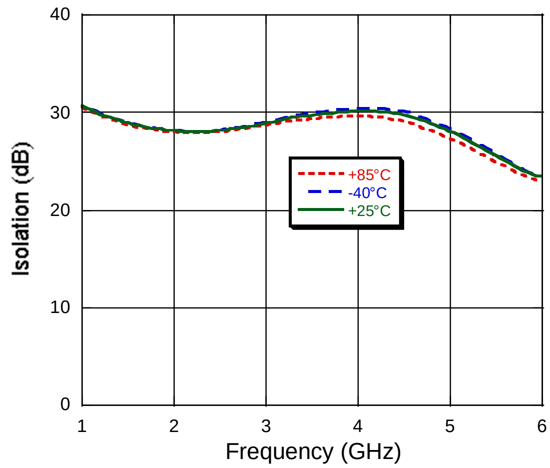
• **North America** Tel: 800.366.2266 / Fax: 978.366.2266
• **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
• **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macomtech.com for additional data sheets and product information.

Typical Performance Curves with 0/3 V Control, 8 pF Capacitors

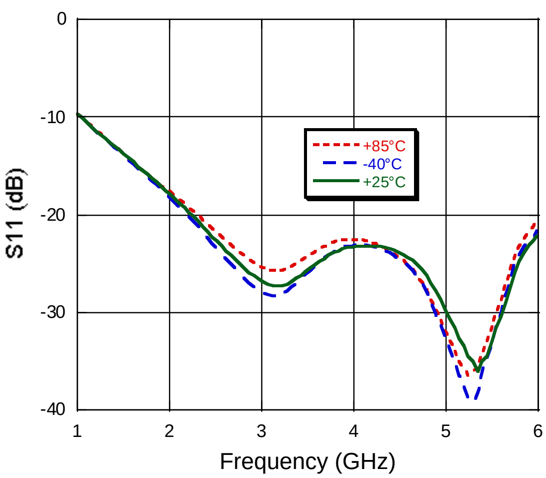
Insertion Loss



Isolation



Return Loss



Qualification

Qualified to M/A-COM specification REL-201, Process Flow –2.

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.