

Rev. V1

- 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
- Fast Switching Speed: 0.5 μ m GaAs PHEMT
- Lead-Free 3 mm 12-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of MASWSS0070

M/A-COM's MASWSS0202 is a broadband GaAs PHEMT MMIC SPDT switch in a lead-free 3 mm 12-lead PQFN package. The MASWSS0202 is ideally suited for applications where very small size and low cost are required.

The MASWSS0202 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Part Number	Package
MASWSS0202TR-3000	3000 piece reel
MASWSS0202SMB	Sample Test Board (Includes 5 Samples)

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

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GaAs Broadband SPDT Switch
DC - 6.0 GHz

Rev. V1

Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\ \Omega$, $V_C = 0\ \text{V} / 3\ \text{V}$, 8 pF Capacitor³

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss ⁴	2 - 3 GHz	dB	—	0.55	0.9
	3 - 4 GHz	dB	—	0.55	0.9
	4 - 5 GHz	dB	—	0.65	1.0
	5 - 6 GHz	dB	—	0.75	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				
	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 2.4 GHz	dBm	—	91	—
	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 5.8 GHz	dBm	—	81	—
	$V_C = 0.0\ \text{V} / 5\ \text{V}$ @ 2.4 GHz	dBm	—	99	—
IIP3	Two Tone, +5 dBm / Tone, 5 MHz Spacing				
	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 2.4 GHz	dBm	—	52	—
	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 5.8 GHz	dBm	—	50	—
	$V_C = 0.0\ \text{V} / 5\ \text{V}$ @ 2.4 GHz	dBm	—	53	—
Input P-1dB	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 2.4 GHz	dBm	—	32	—
	$V_C = 0.0\ \text{V} / 3\ \text{V}$ @ 5.8 GHz	dBm	—	29	—
	$V_C = 0.0\ \text{V} / 5\ \text{V}$ @ 2.4 GHz	dBm	—	37	—
	$V_C = 0.0\ \text{V} / 5\ \text{V}$ @ 5.8 GHz	dBm	—	35	—
2nd Harmonic	2.4 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-88	—
	5.3 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-91	—
	5.8 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-77	—
3rd Harmonic	2.4 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-87	—
	5.3 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-81	—
	5.8 GHz, $P_{IN} = +20\ \text{dBm}$	dBc	—	-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\ \text{V}$	μA	—	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.

Truth Table⁵

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 $\pm$ 0.2 V.
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.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

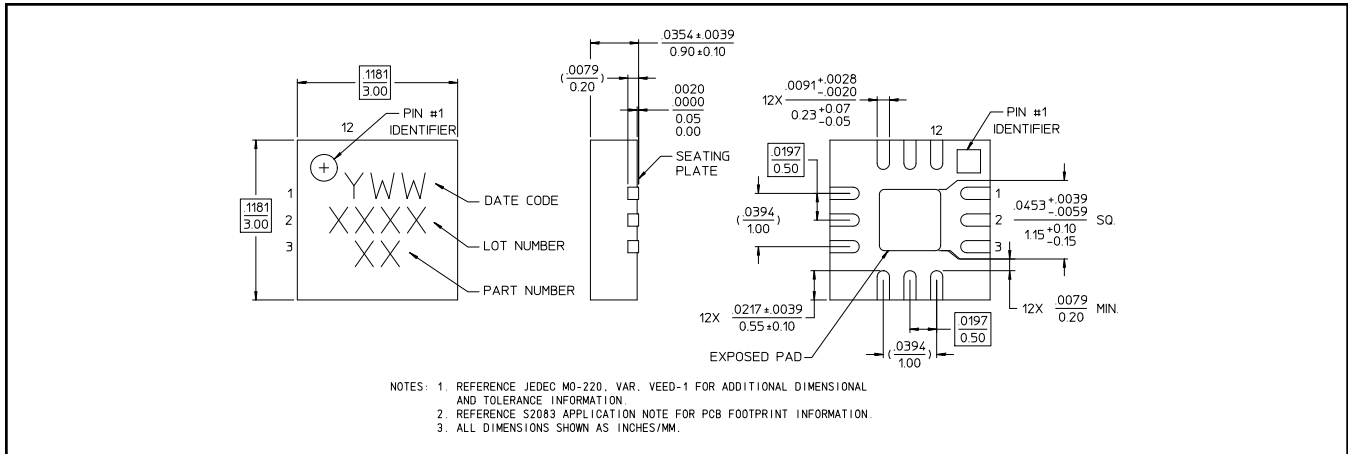
• **North America** Tel: 800.366.2266 / Fax: 978.366.2266• **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300• **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298Visit www.macontech.com for additional data sheets and product information.

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GaAs Broadband SPDT Switch DC - 6.0 GHz

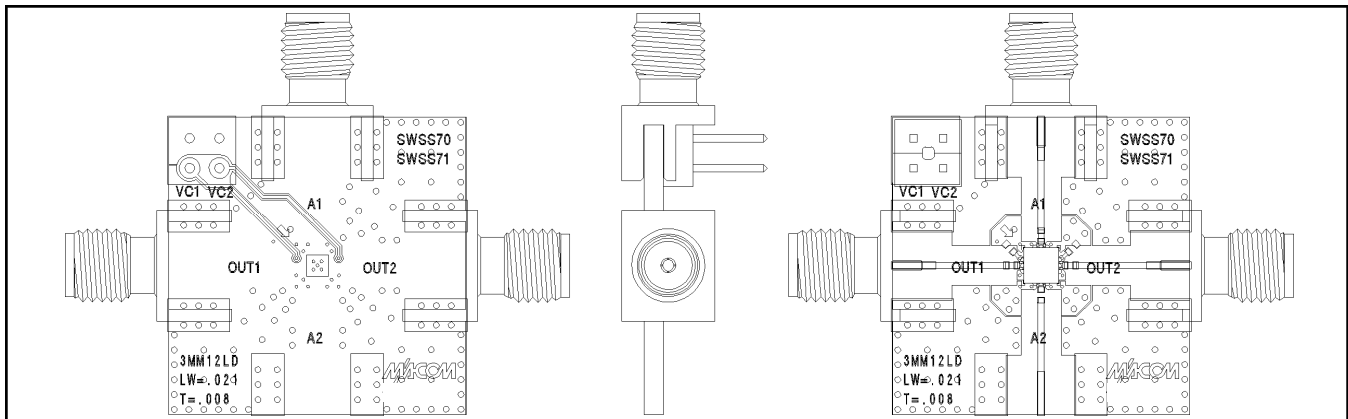
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Lead-Free 3 mm 12-Lead PQFN[†]

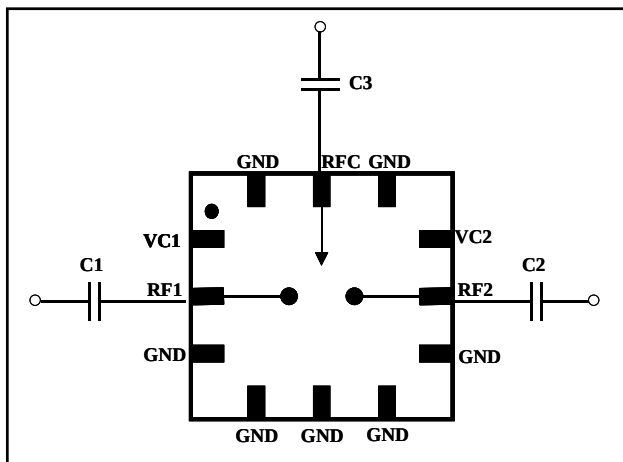


[†] Reference Application Note M538 for lead-free solder reflow recommendations.

Evaluation Board



Application Schematic



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

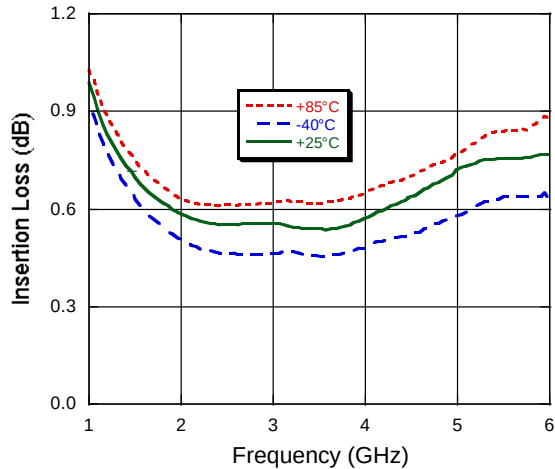
Qty.	Description
3	Capacitor, 3.0 pF, 0402, SMT, 5% (C1-C3)

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

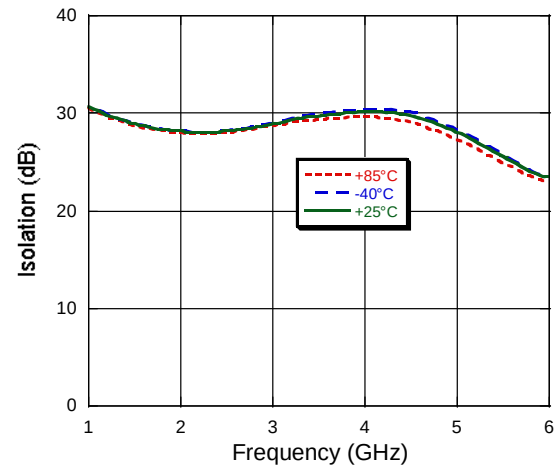
Qty.	Description
3	Capacitor, 8.0 pF, 0402, SMT, 5% (C1-C3)

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

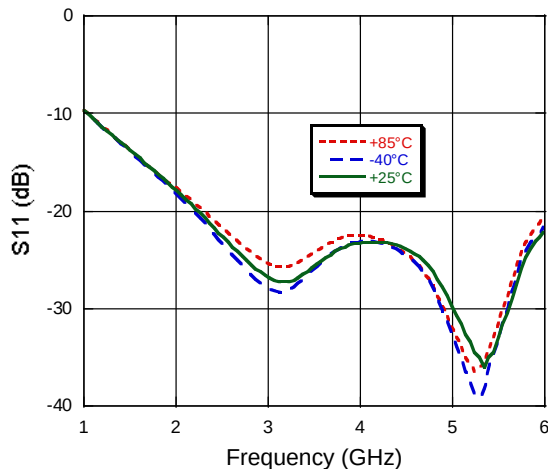
Insertion Loss



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.