

**GaAs Broadband DPDT Diversity Switch**  
**0.5 - 3.0 GHz**
**MASWSS0130**  
**V5**
**Features**

- Ideal for 802.11 b/g Applications
- Broadband Performance: 0.5 - 3.0 GHz
- Low Insertion Loss: 0.6 dB @ 2.4 GHz
- High Isolation: 25 dB @ 2.4 GHz
- Fast Switching Speed: 0.5  $\mu$ m GaAs PHEMT Process
- High P1dB: 34 dBm @ 3 V
- Lead-Free 3 mm 12-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS\* Compliant and 260°C Reflow Compatible

**Description**

M/A-COM's MASWSS0130 is a broadband GaAs PHEMT MMIC DPDT diversity switch in a low cost, lead-free 3 mm 12-lead PQFN plastic package. The MASWSS0130 is ideally suited for applications where very small size and low cost are required.

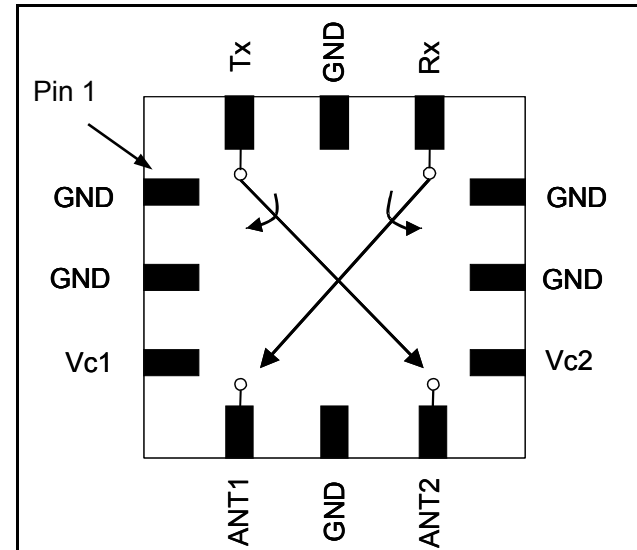
Typical applications are for WLAN IEEE 802.11b/g systems that employ two antennas for transmit and receive diversity. Designed for high power, this DPDT switch is optimized for high linearity at 2.4 GHz.

The MASWSS0130 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

**Ordering Information <sup>1</sup>**

Part Number	Package
MASWSS0130	Bulk Packaging
MASWSS0130TR	7 inch, 1000 piece reel
MASWSS0130TR-3000	13 inch, 3000 piece reel
MASWSS0130SMB	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	GND	Ground
2	GND	Ground
3	V <sub>c</sub> 1	Control 1
4	ANT1	Antenna Port 1
5	GND	Ground
6	ANT2	Antenna Port 2
7	V <sub>c</sub> 2	Control 2
8	GND	Ground
9	GND	Ground
10	Rx	Receive Port
11	GND	Ground
12	Tx	Transmit Port

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

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Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega$ ,  $V_C = 0 \text{ V}/3 \text{ V}$ , 8 pF Capacitor <sup>2,3</sup>**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss <sup>3</sup>	2.4 GHz	dB		0.6	0.9
Isolation (on/off or off/on)	2.4 GHz	dB	20	25	
Return Loss	2.4 GHz	dB		23	
IP2	Two Tone, +15 dBm per tone, 5 MHz Spacing, 2.4 GHz	dBm		94	
IIP3	Two Tone, +15 dBm per tone, 5 MHz Spacing, 2.4 GHz	dBm		55	
Input P1dB	2.4 GHz	dBm		34	
Input P0.1dB	2.4 GHz	dBm		30	
2 <sup>nd</sup> Harmonic	2.4 GHz, $P_{IN} = 20 \text{ dBm}$	dBm		-80	
3 <sup>rd</sup> Harmonic	2.4 GHz, $P_{IN} = 20 \text{ dBm}$	dBm		-95	
Trise, Tfall	10% to 90% RF 90% to 10% RF	nS nS		34 35	
Ton, Toff	50% control to 90% RF 50% control to 10% RF	nS		48 54	
Transients		mV		7	
Control Current	$ V_C  = 3 \text{ V}$	$\mu\text{A}$		5	25

2. External DC blocking capacitors are required on all RF ports.  
3. Insertion loss can be optimized by varying the DC blocking capacitor value.

**Absolute Maximum Ratings <sup>4,5</sup>**

Parameter	Absolute Maximum
Input Power @ 3 V Control	+35 dBm
Input Power @ 5 V Control	+35 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

**Qualification**

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

**Handling Procedures**

Please observe the following precautions to avoid damage:

**Static Sensitivity**

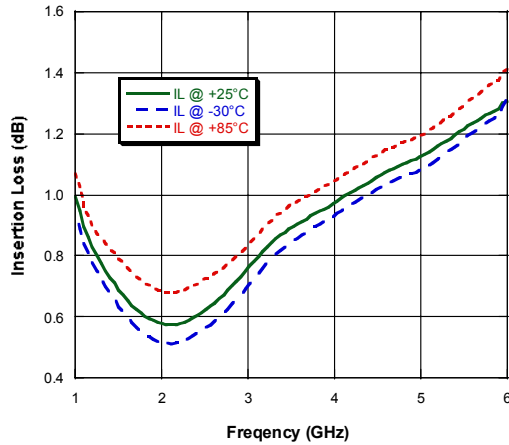
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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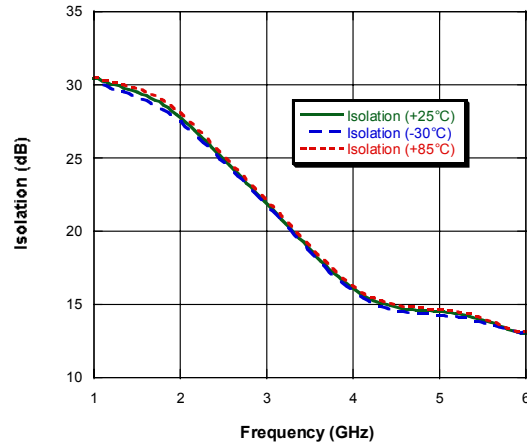
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**Typical Performance Curves**

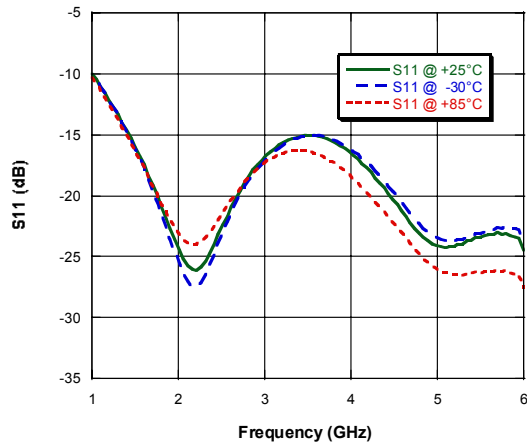
**Insertion Loss**



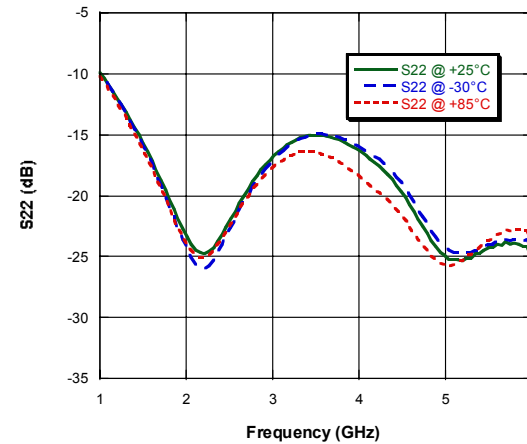
**Isolation**



**Input Return Loss**



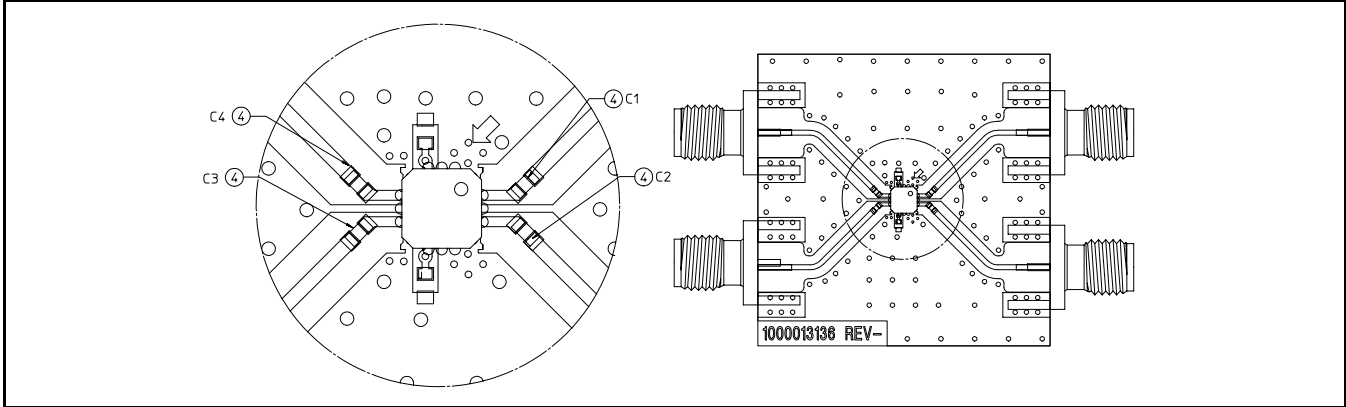
**Output Return Loss**



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**Evaluation Board**



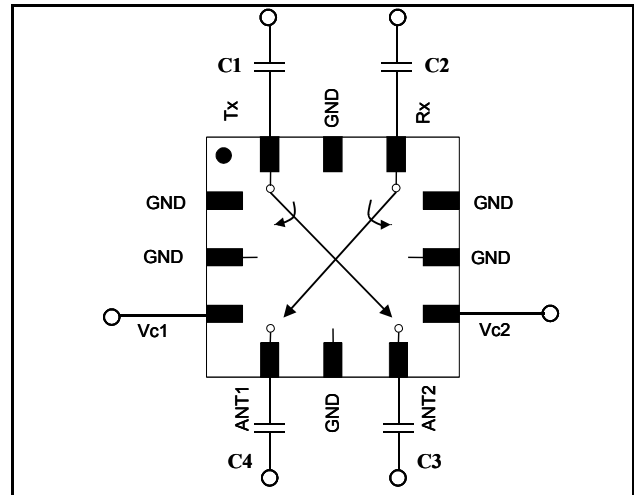
Qty	Description
4	Capacitor, 8 pF, 0402, SMT, 5% (C1 - C4)

**Truth Table <sup>6</sup>**

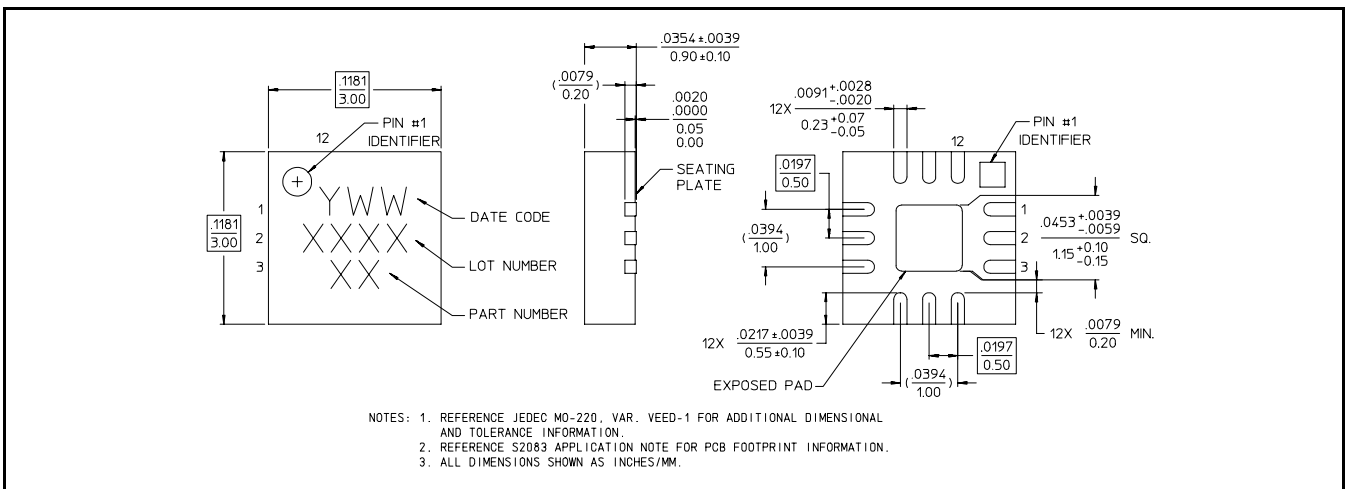
Control V <sub>c1</sub>	Control V <sub>c2</sub>	ANT 1- Rx	ANT 1- Tx	ANT 2- Tx	ANT 2- Rx
1	0	On	Off	On	Off
0	1	Off	On	Off	On
1	1	Off	Off	Off	Off
0	0	Off	Off	Off	Off

6. 1 = +2.9 to +5V, 0 = 0 ± 0.2V

**Application Schematic**



**Lead-Free 3 mm 12-Lead PQFN<sup>†</sup>**



<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.