MASWSS0130

GaAs Broadband DPDT Diversity Switch
0.5 - 3.0 GHz

Rev. 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 µm 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.

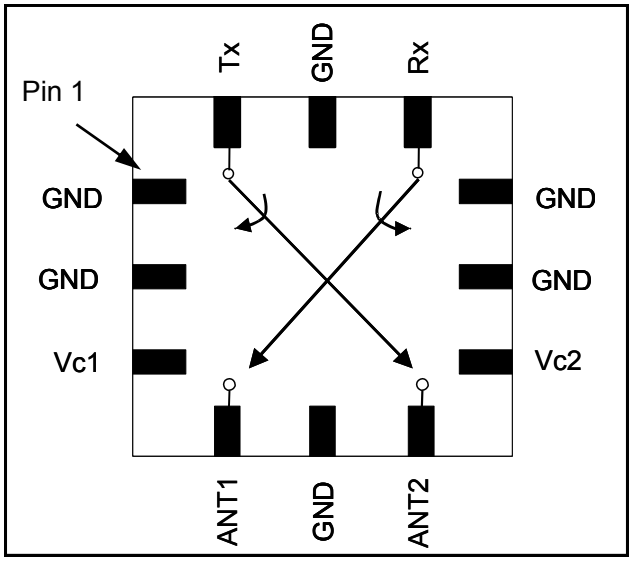
The MASWSS0130 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information [1]

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_C1	Control 1
4	ANT1	Antenna Port 1
5	GND	Ground
6	ANT2	Antenna Port 2
7	V_C2	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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GaAs Broadband DPDT Diversity Switch
0.5 - 3.0 GHz

Electrical Specifications: T_A = 25°C, Z_0 = 50 Ω, V_C = 0 V/3 V, 8 pF Capacitor [2,3]

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss [3]	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	—
2nd Harmonic	2.4 GHz, P_{IN} = 20 dBm	dBm	—	-80	—
3rd Harmonic	2.4 GHz, P_{IN} = 20 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	|Vc| = 3 V	µA	—	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 [4,5]

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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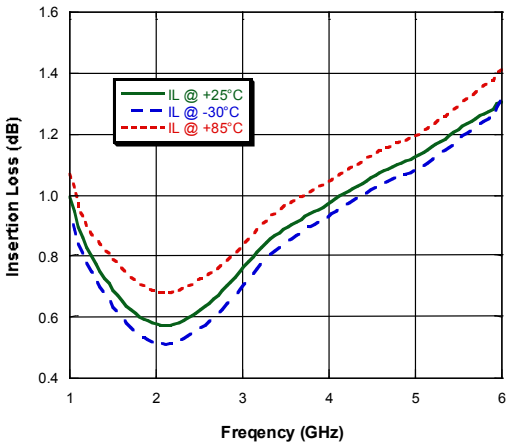
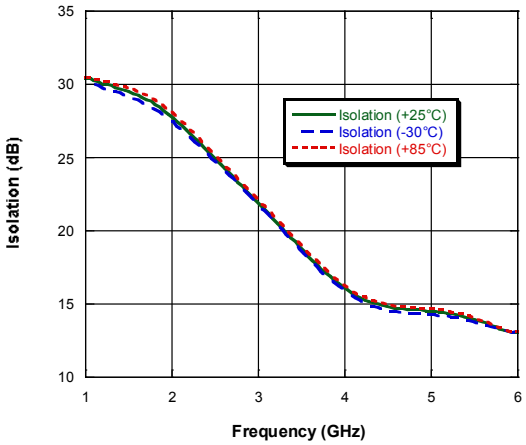
Typical Performance Curves

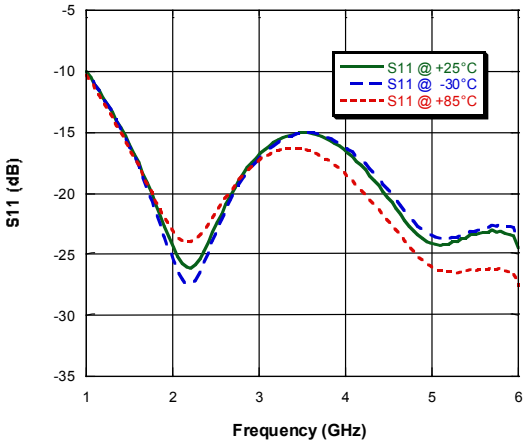
Insertion Loss



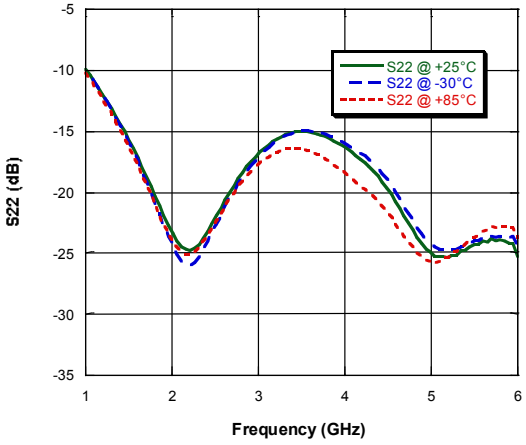
Isolation



Input Return Loss



Output Return Loss



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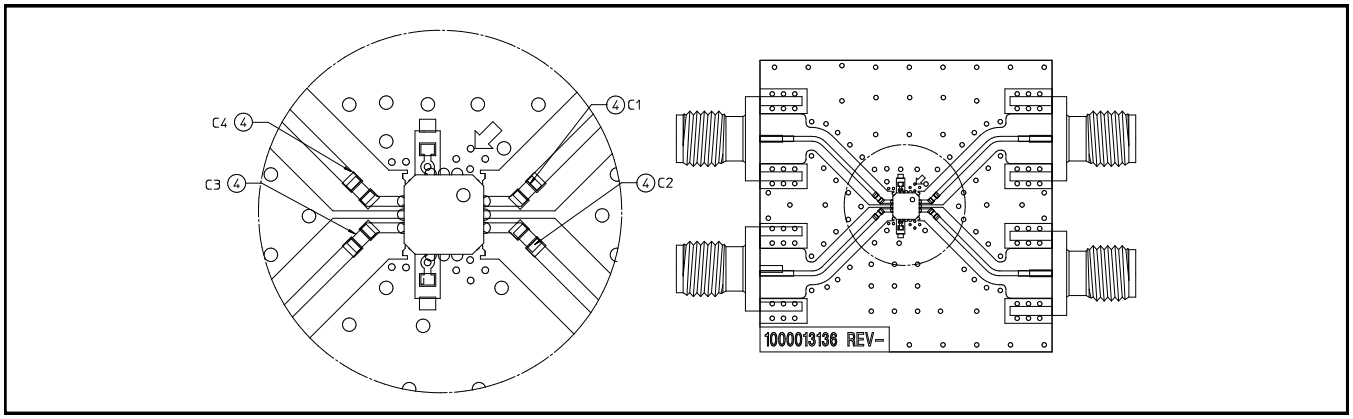
Evaluation Board



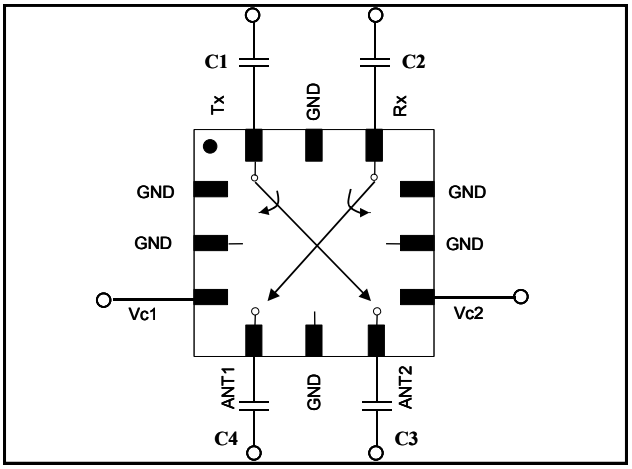
Qty	Description
4	Capacitor, 8 pF, 0402, SMT, 5% (C1 - C4)

Truth Table [6]

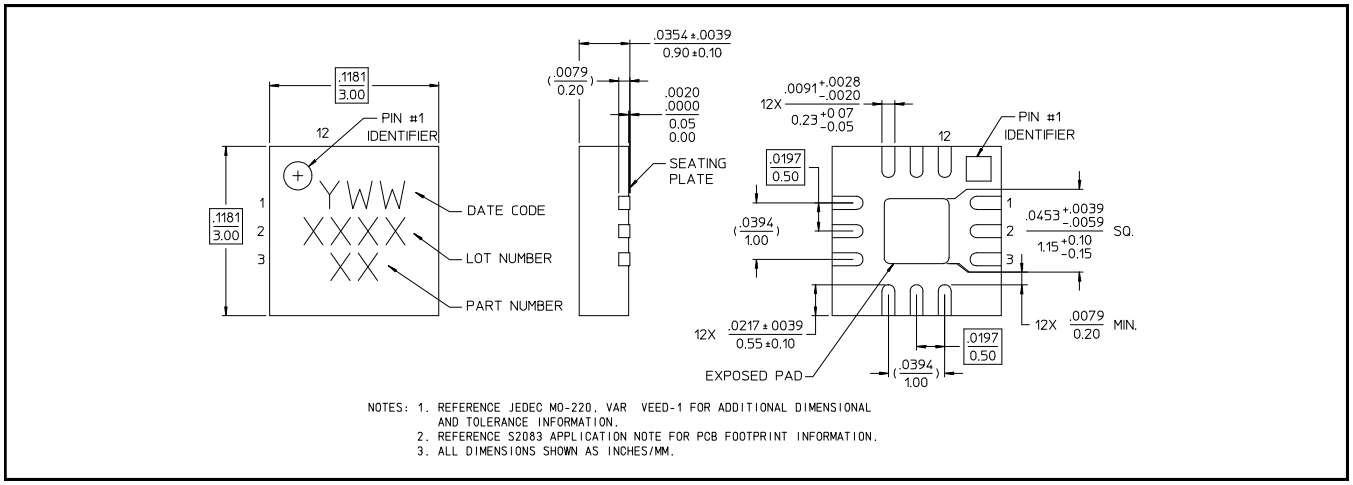
Control V_C1	Control V_C2	ANT 1-Rx	ANT 1-Tx	ANT 2-Tx	ANT 2-Rx
1	0	On	Off	On	Off
0	1	Off	On	Off	On
1	1	Off	Off	Off	Off
0	0	Off	Off	Off	Off

6. 1 = +2.9 to +5V, 0 = 0 ± 0.2V

Application Schematic



Lead-Free 3 mm 12-Lead PQFN†



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

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