



**THE DATASHEET OF  
MASWSS0204TR-3000**



## GaAs SPDT 2.7 V High Power Switch DC - 3.0 GHz

Rev. V3

### Features

- Low Voltage Operation: 2.7 V
- High IP3: +56 dBm
- Low Insertion Loss: 0.30 dB at 1 GHz
- High Isolation: 25 dB at 1 GHz
- 0.5 micron GaAs PHEMT Process
- Lead-Free SC70 Package
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of MASWSS0117

### Description

The MASWSS0204 is a GaAs pHEMT MMIC single pole double throw (SPDT) high power switch in a low cost SC70 six lead package. The MASWSS0204 is ideally suited for applications where high power, low control voltage, low insertion loss, high isolation, small size and low cost are required.

Typical applications are for CDMA handset systems that connect separate transceiver and/or GPS functions to a common antenna, as well as other related handset and general purpose applications. The MASWSS0204 can be used in all systems operating up to 3 GHz requiring high power at low control voltage.

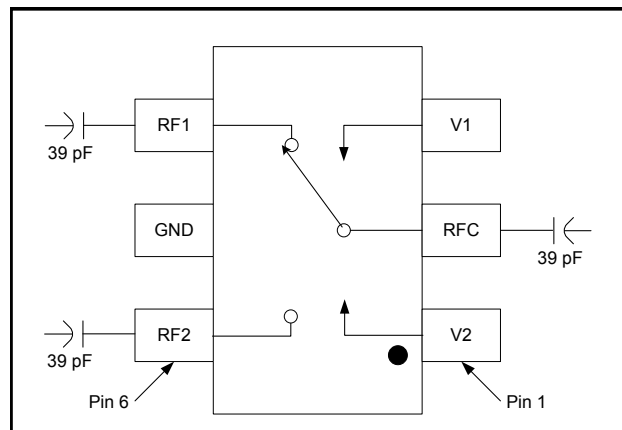
The MASWSS0204 is fabricated using a 0.5 micron gate length GaAs pHEMT process. The process features full passivation for performance and reliability.

### Ordering Information <sup>1,2</sup>

Part Number	Package
MASWSS0204	Bulk Packaging
MASWSS0204TR-3000	3000 piece reel
MASWSS0204SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

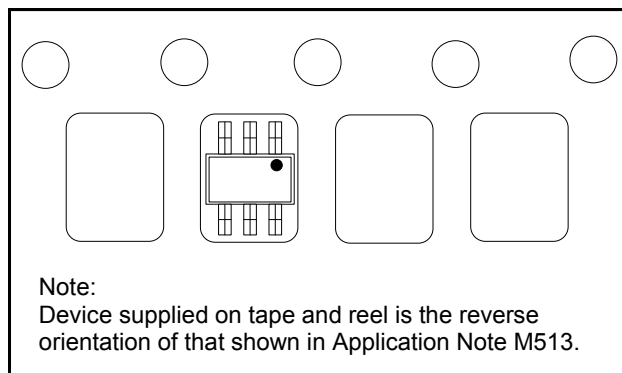
### Functional Block Diagram



### Pin Configuration

Pin No.	Pin Name	Description
1	V2	Vcontrol 2
2	RFC	RF Common
3	V1	Vcontrol 1
4	RF1	RF Port 1
5	GND	RF Ground
6	RF2	RF Port 2

### MASWSS0204 orientation in tape



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

## GaAs SPDT 2.7 V High Power Switch DC - 3.0 GHz

Rev. V3

Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $V_C = 0\text{ V}/2.7\text{ V}$ ,  $Z_0 = 50\ \Omega$ <sup>3</sup>

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss <sup>4</sup>	DC - 1 GHz	dB	—	0.30	0.65
	1 - 2 GHz		—	0.35	—
	2 - 3 GHz		—	0.35	—
Isolation	DC - 1 GHz	dB	23	25	—
	1 - 2 GHz		—	19	—
	2 - 3 GHz		—	15	—
Return Loss	DC - 3 GHz	dB	—	20	—
IP3	825 MHz Two Tone, +24 dBm Total Pin, 5 MHz Spacing	dBm	—	56	—
Cross Modulation	For Cell Band: Two-tone signal input: $T_{x1} = +22\text{ dBm @ } 820\text{ MHz}$ , $T_{x2} = +22\text{ dBm @ } 821\text{ MHz}$ , $R_x\text{ interfere} = -23\text{ dBm @ } 869\text{ MHz}$ .	dBm	—	-99	—
	For PCS Band: Two-tone signal input: $T_{x1} = +18\text{ dBm @ } 1880\text{ MHz}$ , $T_{x2} = +18\text{ dBm @ } 1881\text{ MHz}$ , $R_x\text{ interfere} = -23\text{ dBm @ } 1960\text{ MHz}$ .	dBm	—	-94	—
P0.1dB	1 GHz	dBm	—	38	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	—	70	—
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	ns	—	100	—
Transients	In Band	mV	—	25	—
Control Current	$V_C = 2.7\text{ V}$	$\mu\text{A}$	—	5	20

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, e.g. 1000 pF for 100 MHz - 1 GHz, 39 pF for 0.5 - 3 GHz.

### Absolute Maximum Ratings<sup>5,6</sup>

Parameter	Absolute Maximum
Input Power (0.5 - 3 GHz, 3 V Control)	+38 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.

6. M/A-COM Technology does not recommend sustained operation near these survivability limits.

### Truth Table<sup>7,8,9</sup>

V1	V2	ANT- RF1	ANT - RF2
1	0	On	Off
0	1	Off	On

7. For positive voltage control, external DC blocking capacitors are required on all RF ports.

8. Differential voltage,  $V(\text{state } 1) - V(\text{state } 0)$ , must be +2.7 V minimum, but must not exceed 8.5 V.

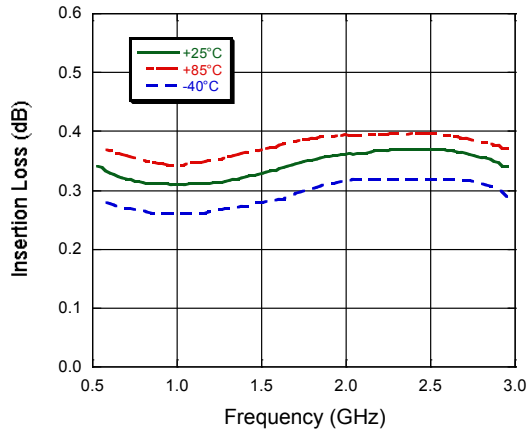
9. 0 = -5 V to +2.3 V, 1 = -2.3 V to +5 V.

## GaAs SPDT 2.7 V High Power Switch DC - 3.0 GHz

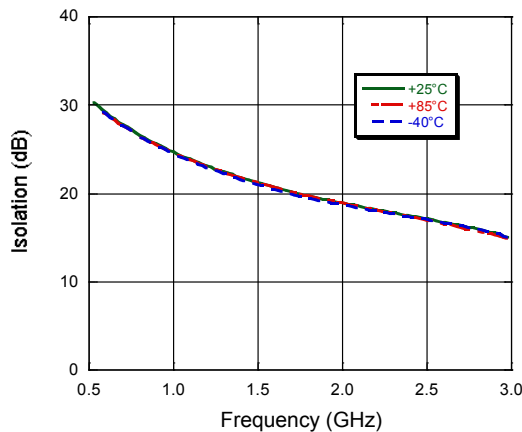
Rev. V3

### Typical Performance Curves, 39 pF

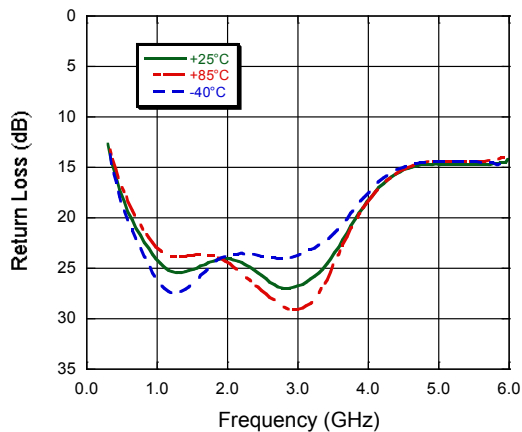
#### Insertion Loss



#### Isolation



#### Return Loss



#### Qualification

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

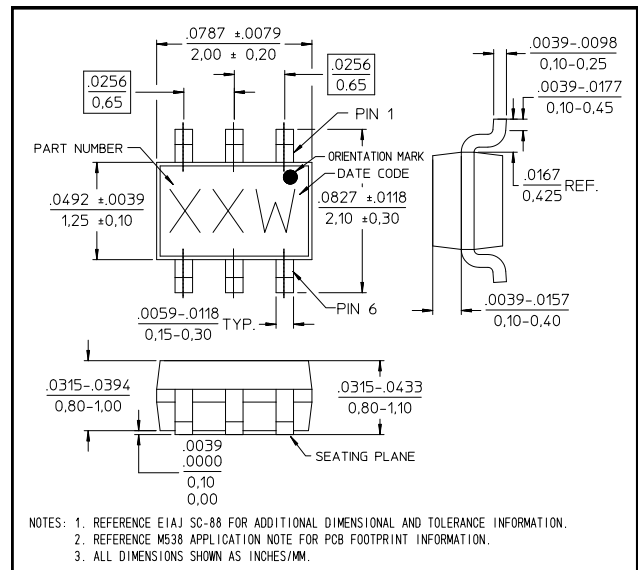
#### Handling Procedures

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.

#### Lead-Free SC70 Plastic Package<sup>†</sup>



<sup>†</sup> Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.  
Plating is 100% matte tin over copper.

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

4

---

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.  
Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ [View MASWSS0204TR-3000 on WIN SOURCE](#)
- ⊖ [M/A-Com Technology Solutions Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management