

## GaAs SPST Switch DC - 2.5 GHz

Rev. V4

### Features

- Very Low Power Consumption: 50  $\mu$ W
- Low Insertion Loss: 1.0 dB
- High Isolation: 35 dB up to 2 GHz
- Very High Intercept Point: 46 dBm IP3
- Nanosecond Switching Speed
- Temperature Range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Lead-Free SOIC-8 Plastic Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- $260^{\circ}\text{C}$  Reflow Compatible
- RoHS\* Compliant Version of SW-259

### Description

The MASWSS0162 is a GaAs MMIC SPST switch in a lead-free SOIC-8 lead surface mount plastic package.

The MASWSS0162 is ideally suited for use where low power consumption is required. Typical applications include transmit/receive switching, switch matrices and switched filter banks in systems such as radio and cellular equipment, PCM, GPS, fiber optic modules, and other battery powered radio equipment.

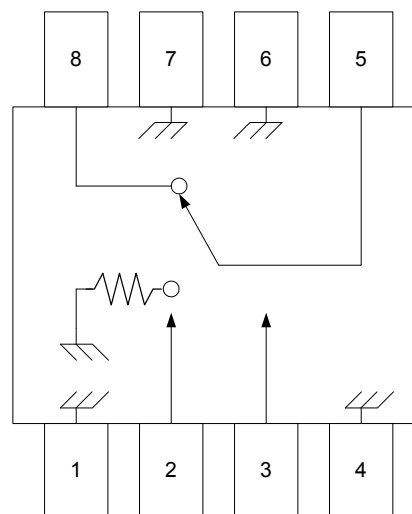
The MASWSS0162 is fabricated using a monolithic GaAs MMIC using a mature 1 micron process. The process features full chip passivation for increased performance and reliability.

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

| Part Number  | Package         |
|--------------|-----------------|
| MASWSS0162   | Bulk Packaging  |
| MASWSS0162TR | 1000 piece reel |

1. Reference Application Note M513 for reel size information.

### Functional Schematic



### Pin Configuration

| Pin# | Description |
|------|-------------|
| 1    | Ground      |
| 2    | A           |
| 3    | B           |
| 4    | Ground      |
| 5    | RF Port 2   |
| 6    | Ground      |
| 7    | Ground      |
| 8    | RF Port 1   |

\* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

## GaAs SPST Switch DC - 2.5 GHz

Rev. V4

### Electrical Specifications<sup>2</sup>: $T_A = +25^\circ\text{C}$ , $V_C = -5\text{ V} / 0\text{ V}$ , $P_{IN} = 0\text{ dBm}$

| Parameter                   | Test Conditions  | Units         | Min.         | Typ. <sup>3</sup> | Max.          |
|-----------------------------|--|---------------|--------------|-------------------|---------------|
| Insertion Loss <sup>3</sup> | DC - 0.5 GHz<br>0.5 - 1.0 GHz<br>1.0 - 2.0 GHz   | dB            | —            | 0.8<br>0.9<br>1.1 | —<br>1.2<br>— |
| Isolation <sup>3</sup>      | DC - 0.5 GHz<br>0.5 - 1.0 GHz<br>1.0 - 2.0 GHz   | dB            | —<br>45<br>— | 65<br>53<br>40    | —             |
| VSWR On<br>VSWR Off         | DC - 2.0 GHz   | Ratio         | —            | 1.2:1             | —             |
| 1 dB Compression            | $P_{IN}$ @ 0.05 GHz<br>$P_{IN}$ @ 0.5 - 2.0 GHz  | dBm           | —            | 18<br>23          | —             |
| $T_{RISE}$ , $T_{FALL}$     | 10% to 90% RF, 90% to 10% RF   | ns            | —            | 4                 | —             |
| $T_{ON}$ , $T_{OFF}$        | 50% Control to 90% RF, 50% Control to 10% RF   | ns            | —            | 8                 | —             |
| Transients                  | In-Band  | mV            | —            | 35                | —             |
| 2nd Order Intercept         | Measured Relative to Input Power,<br>two-tone up to 5 dBm<br>0.05 GHz<br>0.5 - 2.0 GHz | dBm           | —            | 55<br>68          | —             |
| 3rd Order Intercept         | Measured Relative to Input Power,<br>two-tone up to 5 dBm<br>0.05 GHz<br>0.5 - 2.0 GHz | dBm           | —            | 40<br>46          | —             |
| Control Current             | —  | $\mu\text{A}$ | —            | —                 | 25            |

2. All measurements with 0, -5 V control voltages at 1.0 GHz in a 50  $\Omega$  system, unless otherwise specified.

3. Typical values listed are based on average of frequency range noted.

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

| Parameter   | Absolute Maximum |
|---|------------------|
| Input Power <sup>6</sup><br>0.05 GHz<br>0.5 - 2.0 GHz | 27 dBm<br>34 dBm |
| Control Voltage                                       | +5 V, -8.5 V     |
| 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. MACOM does not recommend sustained operation near these survivability limits.  
 6. When the RF Input power is applied to a terminated port, the absolute maximum is +32 dBm.

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

| Control Inputs |   | Condition of Switch |
|----------------|---|---------------------|
| A              | B | RF State            |
| 1              | 0 | On                  |
| 0              | 1 | Off                 |

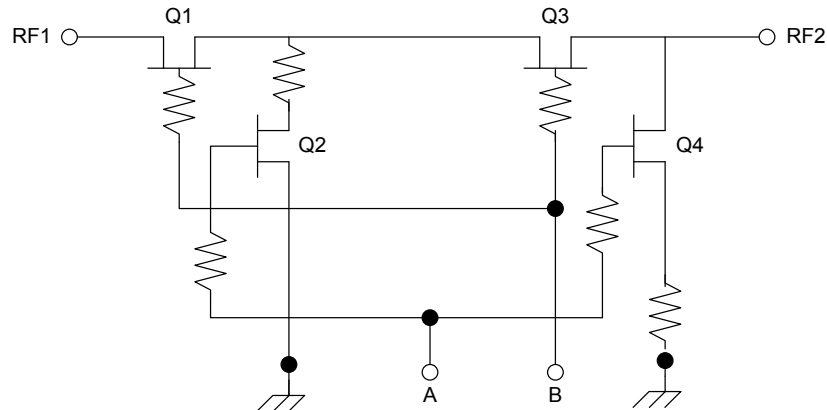
7. "0" = 0 to -0.2 V @ 20  $\mu\text{A}$  maximum.

8. "1" = -5 V @ 20  $\mu\text{A}$  typical to -8 V @ 600  $\mu\text{A}$  maximum.

## GaAs SPST Switch DC - 2.5 GHz

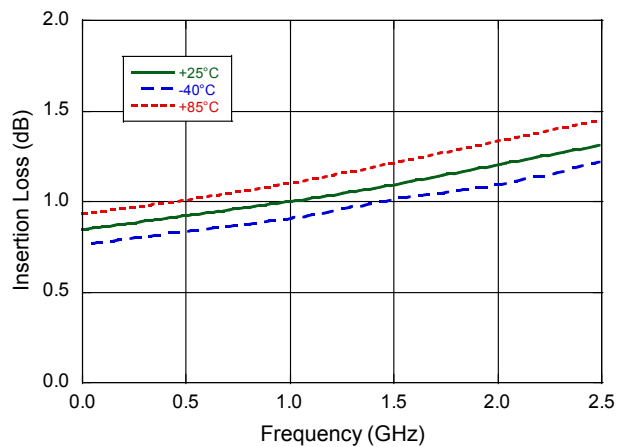
Rev. V4

### Electrical Schematic

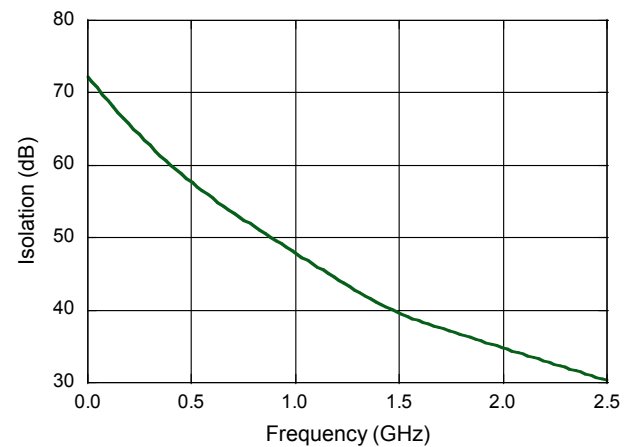


### Typical Performance Curves

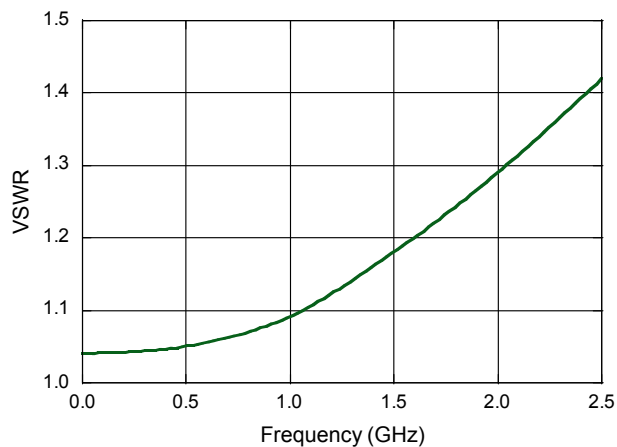
#### Insertion Loss



#### Isolation



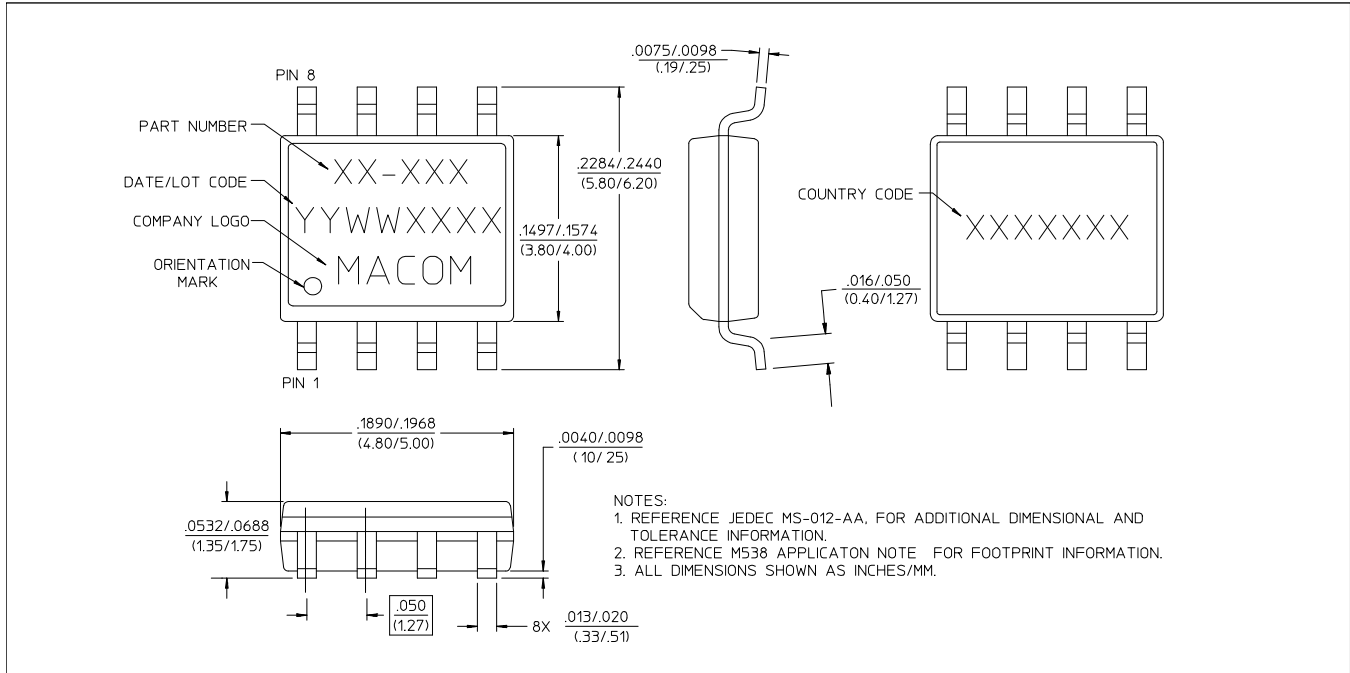
#### VSWR



## GaAs SPST Switch DC - 2.5 GHz

Rev. V4

### Lead-Free SOIC-8<sup>†</sup>



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

MACOM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with MACOM 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.

5

---

MACOM 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](https://www.macom.com) for additional data sheets and product information.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[MACOM:](#)

[MASWSS0162TR-3000](#)