

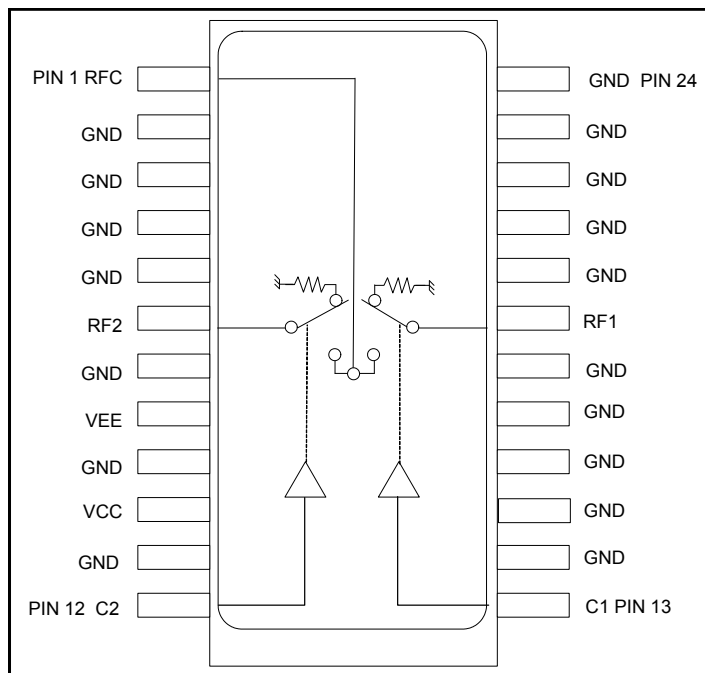
### Features

- Typical Isolation: 36 dB (2,000 MHz)
- Typical Insertion Loss: 1.8 dB (2,000 MHz)
- Integral ASIC TTL/CMOS Driver
- Low DC Power Consumption
- 50 Ohm Nominal Impedance
- Tape and Reel Packaging Available
- Test Boards Available
- Lead-Free SOW-24 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of SW65-0114

### Description

M/A-COM's MASW-007075-000100 is a GaAs MMIC absorptive SPDT switch with an integral silicon ASIC driver. This device is in a 24-lead plastic package. This switch offers excellent broadband performance and repeatability from DC to 3 GHz, while maintaining low DC power dissipation. The MASW-007075-000100 is ideally suited for wireless infrastructure applications. Also available in ceramic package with improved performance.

### Functional Block Diagram



### Ordering Information

| Part Number        | Package           |
|--------------------|-------------------|
| MASW-007075-000100 | Bulk Packaging    |
| MASW-007075-0001TR | 1000 piece reel   |
| MASW-007075-0001TB | Sample Test Board |

Note: Reference Application Note M513 for reel size information.

### Pin Configuration

| Pin No. | Function        | Pin No. | Function |
|---------|-----------------|---------|----------|
| 1       | RFC             | 13      | C1       |
| 2       | GND             | 14      | GND      |
| 3       | GND             | 15      | GND      |
| 4       | GND             | 16      | GND      |
| 5       | GND             | 17      | GND      |
| 6       | RF2             | 18      | GND      |
| 7       | GND             | 19      | RF1      |
| 8       | V <sub>EE</sub> | 20      | GND      |
| 9       | GND             | 21      | GND      |
| 10      | V <sub>CC</sub> | 22      | GND      |
| 11      | GND             | 23      | GND      |
| 12      | C2              | 24      | GND      |

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

## GaAs SPDT Absorptive Switch with ASIC Driver, DC-3.0 GHz

Rev. V4

### Electrical Specifications: $T_A = 25^\circ\text{C}$ , $Z_0 = 50\Omega$

| Parameter   | Test Conditions  | Units         | Min  | Typ   | Max   |
|---|--|---------------|------|-------|-------|
| Insertion Loss  | DC - 3.0 GHz   | dB            | —    | 1.8   | 2.2   |
| Isolation<br>(All arms off)   | DC - 3.0 GHz   | dB            | 33   | 36    | —     |
| VSWR  | DC - 3.0 GHz<br>On   | —             | —    | 1.7:1 | 2.2:1 |
|   | Off  | —             | —    | 2.1:1 | 2.2:1 |
| $T_{\text{rise}}$ $T_{\text{fall}}$<br>$T_{\text{on}}$ $T_{\text{off}}$<br>Transients | 10%/90%, 90%/10% <sup>1</sup>                              | ns            | —    | 15    | 50    |
|   | 50% TTL to 90%/10% RF                                      | ns            | —    | 50    | 150   |
|   | In-band (peak to peak)                                     | mV            | —    | 50    | 150   |
| 1 dB Compression  | .05 GHz  | dBm           | —    | +20   | —     |
|   | .5 - 3.0 GHz   | dBm           | —    | +27   | —     |
| Input $IP_3$  | Two tone inputs 0.05 GHz                                   | dBm           | —    | +35   | —     |
|   | up to +5 dBm 0.5 - 3.0 GHz                                 | dBm           | —    | +46   | —     |
| $V_{CC}$  | —  | V             | +4.5 | +5.0  | +5.5  |
| $V_{EE}$  | —  | V             | -8.0 | -5.0  | -4.75 |
| $V_{IL}$<br>$V_{IH}$  | LOW-level input voltage                                    | V             | 0.0  | —     | 0.8   |
|   | HIGH-level input voltage                                   | V             | 2.0  | —     | 5.0   |
| lin (Input Leakage Current)   | $V_{in} = V_{CC}$ or GND                                   | $\mu\text{A}$ | -1.0 | —     | 1.0   |
| $I_{CC}$<br>(Quiescent Supply Current)  | $V_{ctrl} = V_{CC}$ or GND                                 | $\mu\text{A}$ | —    | 250   | 400   |
| $\Delta I_{CC}$<br>(Additional Supply Current Per<br>TTL Input Pin)                   | $V_{CC} = \text{Max}$ , $V_{ctrl} = V_{CC} - 2.1\text{ V}$ | mA            | —    | —     | 1.0   |
| IEE   | $V_{EE}$ min to max, $V_{in} = V_{IL}$ or $V_{IH}$         | mA            | -1.0 | -0.2  | —     |

1. Decoupling capacitors (.01  $\mu\text{F}$ ) are required on the power supply lines.

### Absolute Maximum Ratings<sup>2,3</sup>

| Parameter  | Absolute Maximum  |
|--|---|
| Max. Input Power<br>0.05 GHz<br>0.5 - 3.0 GHz <sup>4</sup> | +27 dBm<br>+34 dBm                                      |
| $V_{CC}$   | $-0.5\text{ V} \leq V_{CC} \leq +7.0\text{ V}$          |
| $V_{EE}$   | $-8.5\text{ V} \leq V_{EE} \leq +0.5\text{ V}$          |
| $V_{CC} - V_{EE}$  | $-0.5\text{ V} \leq V_{CC} - V_{EE} \leq 14.5\text{ V}$ |
| $V_{in}$ <sup>5</sup>                                      | $-0.5\text{ V} \leq V_{in} \leq V_{CC} + 0.5\text{ V}$  |
| Operating Temperature                                      | $-40^\circ\text{C}$ to $+85^\circ\text{C}$              |
| Storage Temperature  | $-65^\circ\text{C}$ to $+125^\circ\text{C}$             |

- Exceeding any one or combination of these limits may cause permanent damage to this device.
- M/A-COM does not recommend sustained operation near these survivability limits.
- When the RF input is applied to the terminated port, the absolute maximum power is +30 dBm.
- Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

### Handling Procedures

Please observe the following precautions to avoid damage:

### Static Sensitivity

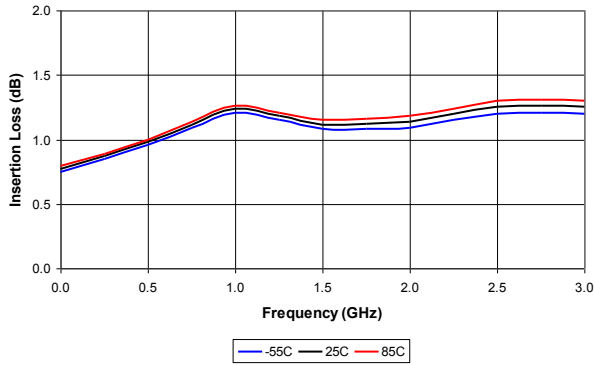
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

### Truth Table

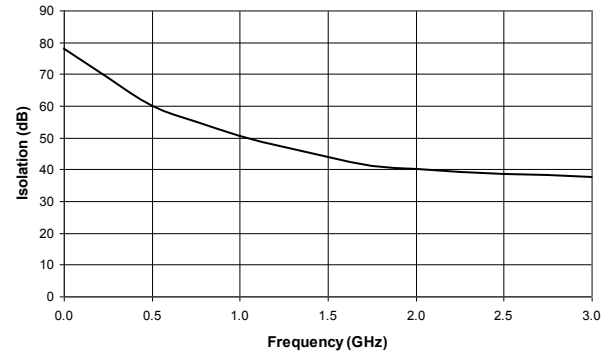
| TTL Control Input |    | RF Common To: |     |
|-------------------|----|---------------|-----|
| C1                | C2 | RF1           | RF2 |
| 1                 | 0  | On            | Off |
| 0                 | 1  | Off           | On  |

## Typical Performance Curves

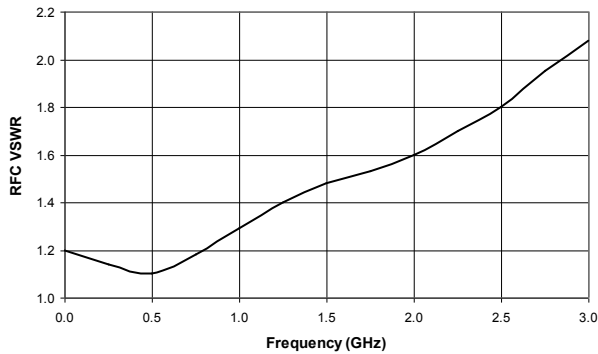
*Insertion Loss vs. Frequency*



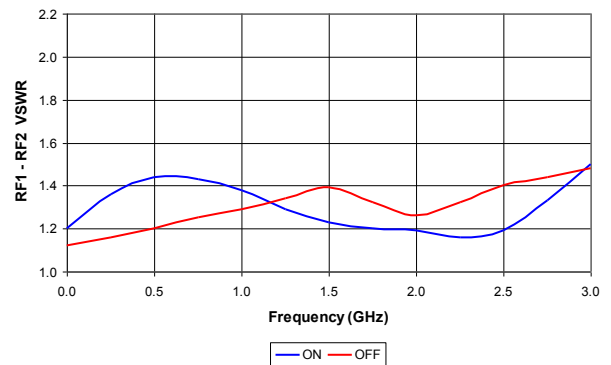
*Isolation Loss vs. Frequency*



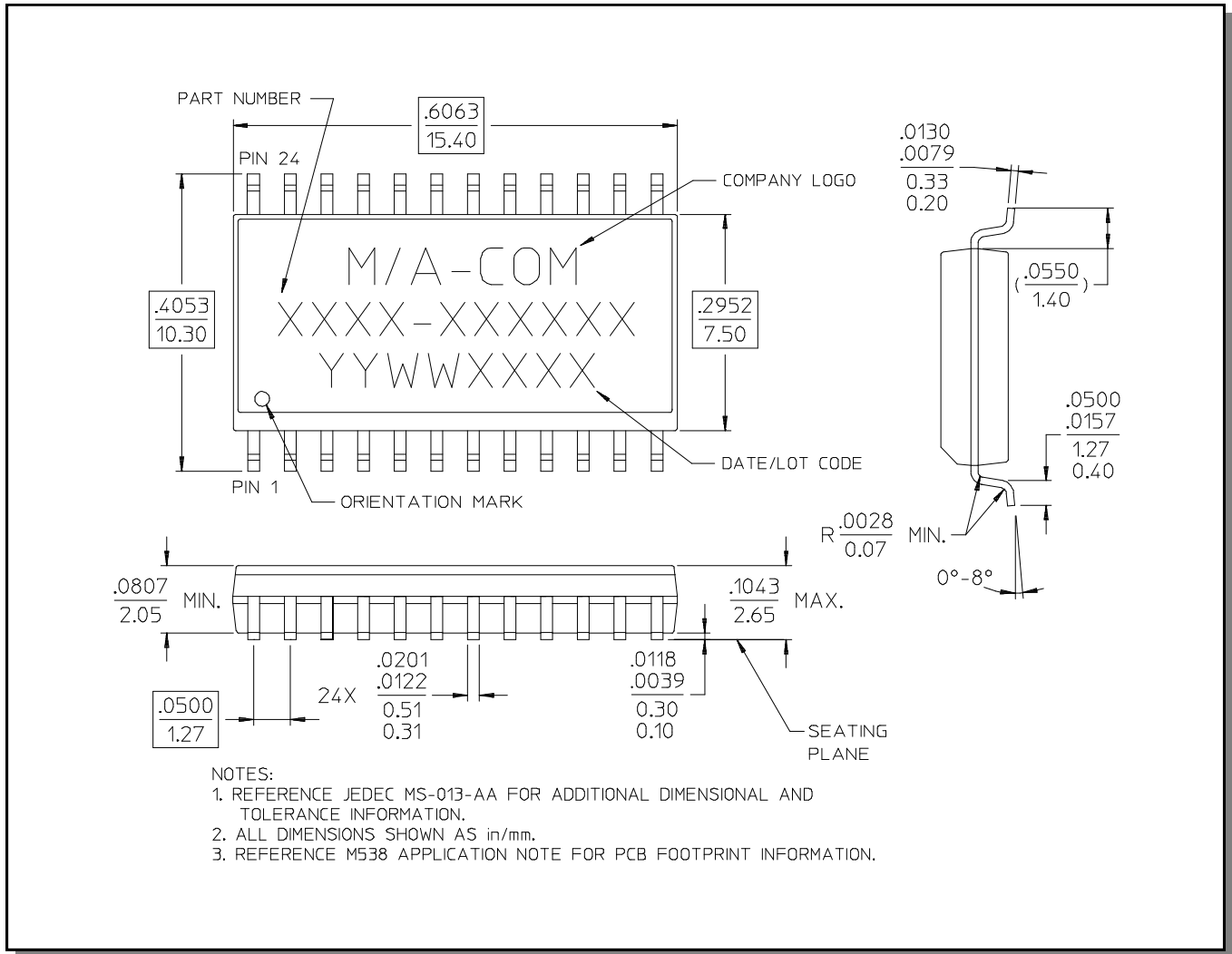
*RF1 VSWR vs. Frequency*



*RF1-RF2 VSWR vs. Frequency*



### Lead-Free, SOW-24<sup>†</sup>



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

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