

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

**MASW-007075-000100  
V1**

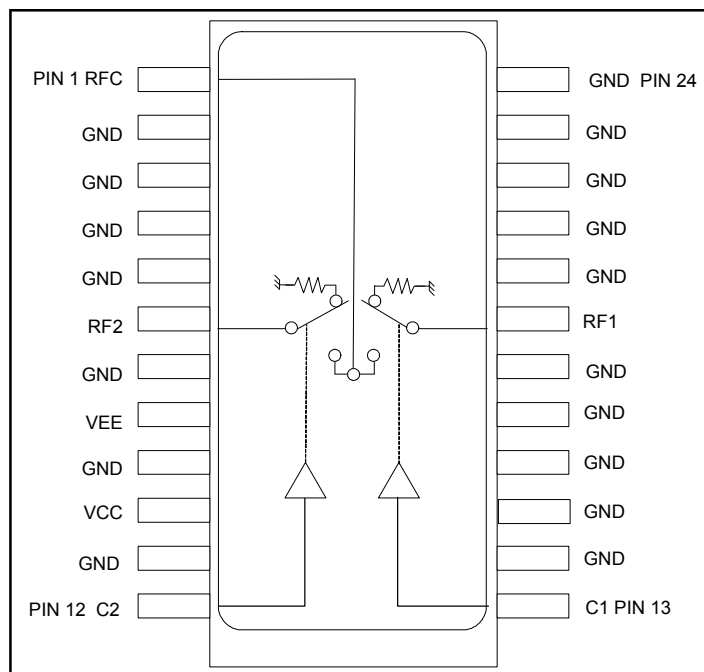
## Features

- 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



## 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      |

## 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.

Note: Die quantity varies.

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

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ASIC Driver, DC-3.0 GHz**
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**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<br>Off  | —<br>—         | —<br>—      | 1.7:1<br>2.1:1 | 2.2:1<br>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><br>50% TTL to 90%/10% RF<br>In-band (peak to peak) | ns<br>ns<br>mV | —<br>—<br>— | 15<br>50<br>50 | 50<br>150<br>150 |
| 1 dB Compression  | .05 GHz<br>.5 - 3.0 GHz  | dBm<br>dBm     | —<br>—      | +20<br>+27     | —<br>—           |
| Input $IP_3$  | Two tone inputs 0.05 GHz<br>up to +5 dBm 0.5 - 3.0 GHz                           | dBm<br>dBm     | —<br>—      | +35<br>+46     | —<br>—           |
| $V_{CC}$  | —  | V              | +4.5        | +5.0           | +5.5             |
| $V_{EE}$  | —  | V              | -8.0        | -5.0           | -4.75            |
| $I_{CC}$  | $V_{CC} = +5.0\text{V}$  | mA             | —           | —              | 4                |
| $I_{EE}$  | $V_{EE} = -5.0\text{V}$  | mA             | —           | —              | -1               |
| Logic "0"   | $I_{in} = 20\mu\text{A max}$   | V              | 0.0         | —              | 0.8              |
| Logic "1"   | $I_{in} = 20\mu\text{A max}$   | V              | 2.0         | —              | 5.0              |

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   |
| Bias Voltages<br>$V_{EE}$<br>$V_{CC}$<br>Control Voltage <sup>5</sup> | -8.5V $\leq V_{EE} \leq$ 0.5V<br>-0.5V $\leq V_{CC} \leq$ +5.5V<br>-0.5V to $V_{CC} + 0.5\text{V}$ |
| Operating Temperature   | -40°C to +85°C   |
| Storage Temperature   | -65°C to +125°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  |

