

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

M/A-COM Products  
Rev. 4

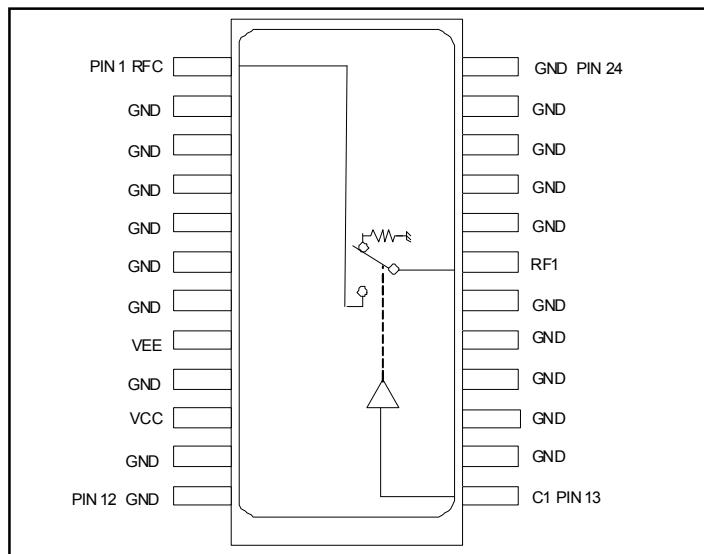
### Features

- Typical Isolation: 42 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 SW65-0014

### Description

M/A-COM's MASW-007076-000100 is a GaAs MMIC absorptive SPST 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-007076-000100 is ideally suited for wireless infrastructure applications. Also available in ceramic package with improved performance.

### Functional Block Diagram



### Ordering Information

Part Number	Package
MASW-007076-000100	Bulk Packaging
MASW-007076-0001TR	1000 piece reel
MASW-007076-0001TB	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	GND	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	GND	24	GND

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

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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 (All arms off)	DC - 3.0 GHz	dB	35	42	—
VSWR	DC - 3.0 GHz On	—	—	1.6:1	2.1:1
	Off	—	—	2.0:1	2.1:1
$T_{\text{rise}}$ $T_{\text{fall}}$ $T_{\text{on}}$ $T_{\text{off}}$ 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 <sub>3</sub>	Two tone inputs 0.05 GHz	dBm	—	+35	—
	Up to +5 dBm 0.5 - 3.0 GHz	dBm	—	+46	—
V <sub>CC</sub>	—	V	+4.5	+5.0	+5.5
V <sub>EE</sub>	—	V	-8.0	-5.0	-4.75
V <sub>IL</sub> V <sub>IH</sub>	LOW-level input voltage	V	0.0	—	0.8
	HIGH-level input voltage	V	2.0	—	5.0
I <sub>in</sub> (Input Leakage Current)	V <sub>in</sub> = V <sub>CC</sub> or GND	uA	-1.0	—	1.0
I <sub>CC</sub> (Quiescent Supply Current)	V <sub>cntrl</sub> = V <sub>CC</sub> or GND	uA	—	250	400
$\Delta I_{CC}$ (Additional Supply Current Per TTL Input Pin)	V <sub>CC</sub> = Max, V <sub>cntrl</sub> = V <sub>CC</sub> - 2.1 V	mA	—	—	1.0
I <sub>EE</sub>	V <sub>EE</sub> min to max, V <sub>in</sub> = V <sub>IL</sub> or V <sub>IH</sub>	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 0.05 GHz 0.5 - 3.0 GHz <sup>4</sup>	+27 dBm +34 dBm
V <sub>CC</sub>	-0.5V $\leq$ V <sub>CC</sub> $\leq$ +7.0V
V <sub>EE</sub>	-8.5V $\leq$ V <sub>EE</sub> $\leq$ +0.5V
V <sub>CC</sub> - V <sub>EE</sub>	-0.5V $\leq$ V <sub>CC</sub> - V <sub>EE</sub> $\leq$ 14.5V
V <sub>in</sub> <sup>5</sup>	-0.5V $\leq$ V <sub>in</sub> $\leq$ V <sub>CC</sub> + 0.5V
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	RF1
1	On
0	Off

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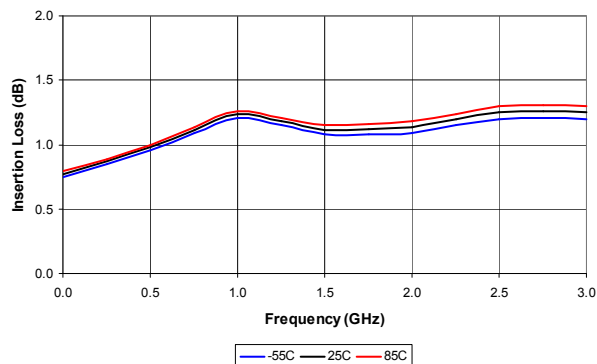
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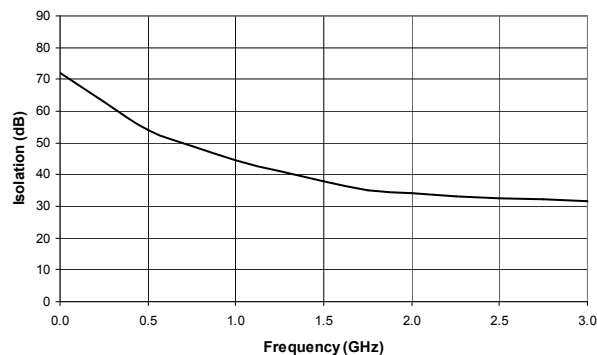
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## Typical Performance Curves

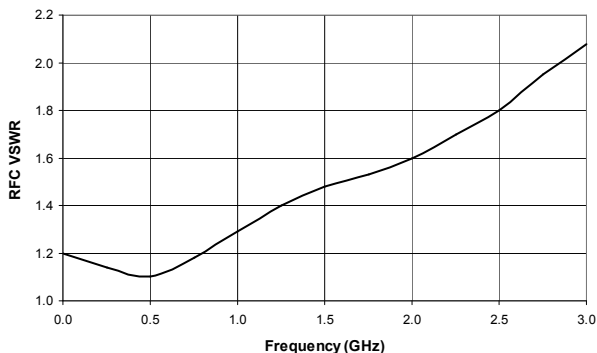
*Insertion Loss vs. Frequency*



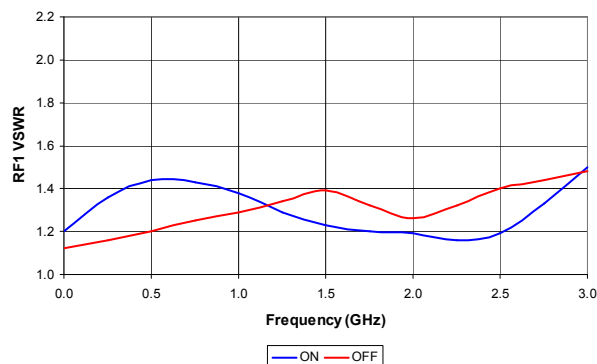
*Isolation Loss vs. Frequency*



*RF VSWR vs. Frequency*



*RF1 VSWR vs. Frequency*



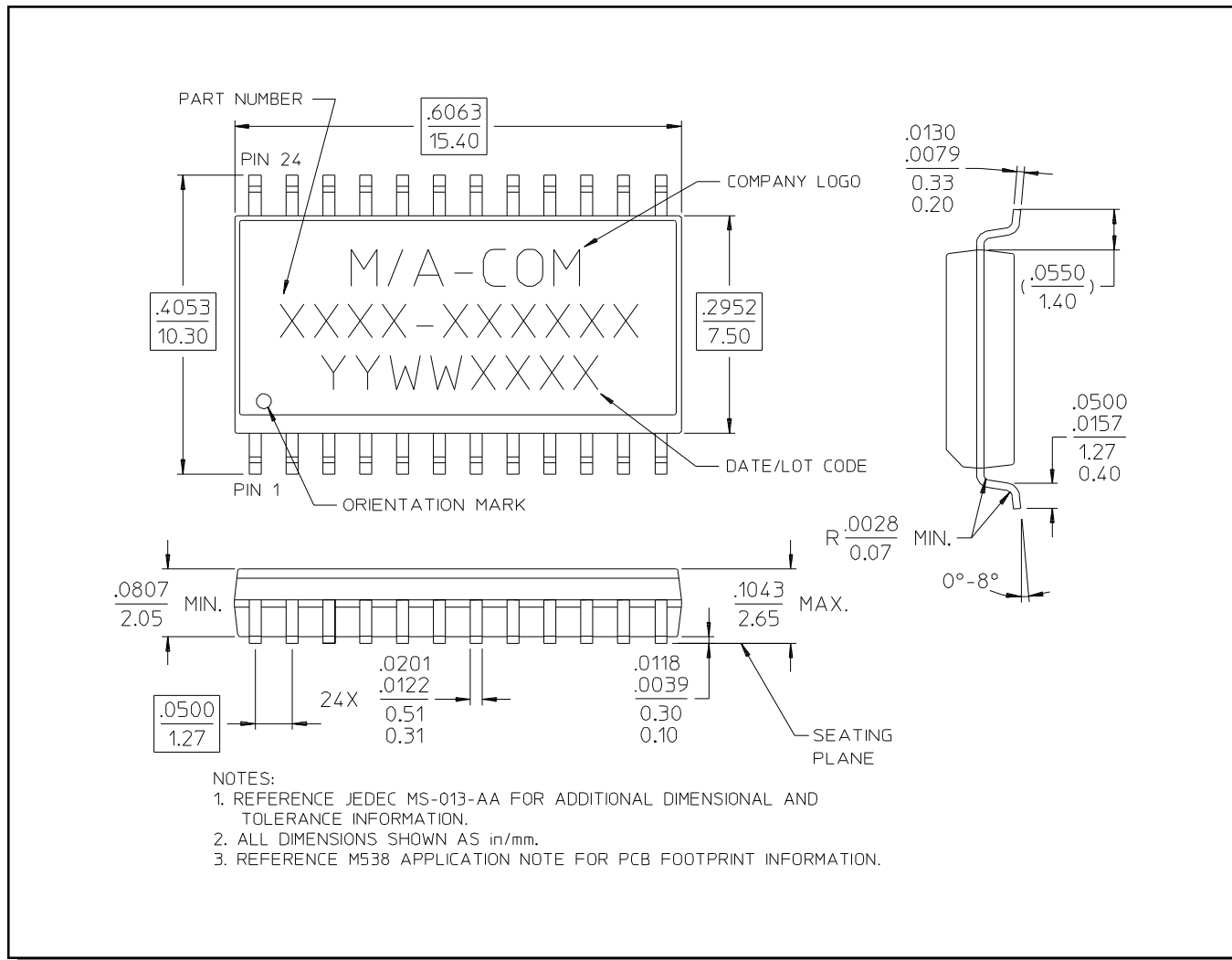
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**Lead-Free, SOW-24<sup>†</sup>**



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