

## GaAs SP2T Absorptive Switch with ASIC Driver, DC-3.0 GHz

Rev. V3

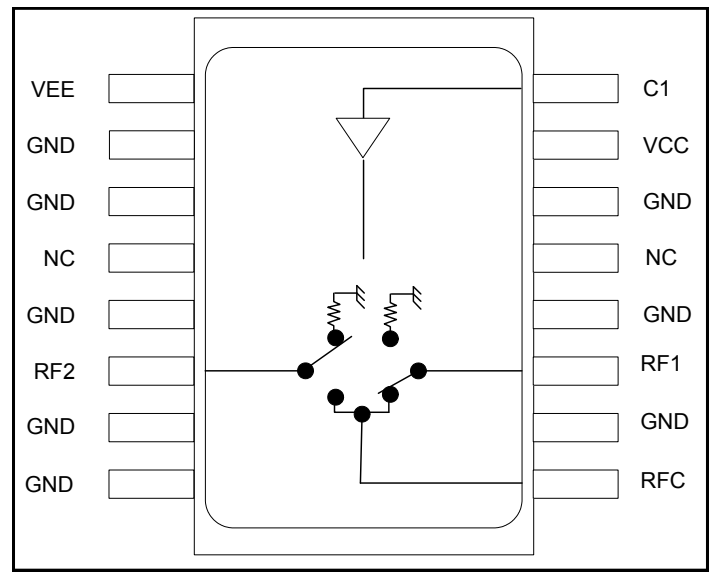
### Features

- Typical Isolation: 30 dB (2,000 MHz)
- Typical Insertion Loss: .75 dB (2,000 MHz)
- ASIC TTL/CMOS Driver
- Low DC Power Consumption
- 50 Ohm Nominal Impedance
- Tape and Reel Packaging Available
- Test Boards Available
- Lead-Free SOIC-16 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free “Green” Mold Compound
- 260°C Reflow Compatible
- RoHS\* Compliant Version of SW65-0313

### Description

M/A-COM's MASW-007072-000100 is a GaAs MMIC absorptive SP2T switch with an integral silicon ASIC driver. This device is in a 16-lead plastic package. This switch offers excellent broadband performance and repeatability from DC to 3 GHz, while maintaining low DC power dissipation. The MASW-007072-000100 is ideally suited for wireless infrastructure applications. Also available in a ceramic package with improved performance.

### Functional Schematic



### Pin Configuration<sup>1</sup>

Pin No.	Function	Pin No.	Function
1	V <sub>EE</sub>	9	RFC
2	GND	10	GND
3	GND	11	RF1
4	NC	12	GND
5	GND	13	NC
6	RF2	14	GND
7	GND	15	V <sub>CC</sub>
8	GND	16	C1

1. NC = No Connection

### Ordering Information

Part Number	Package
MASW-007072-000100	Bulk Packaging
MASW-007072-0001TR	1000 piece reel
MASW-007072-0001TB	Sample Test Board

Note: Reference Application Note M513 for reel size information.

<sup>1</sup> \* 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 - 1.0 GHz	dB	—	0.6	0.75
	DC - 2.0 GHz	dB	—	0.75	0.90
	DC - 3.0 GHz	dB	—	1.2	1.45
Isolation (All arms off)	DC - 1.0 GHz	dB	35	38	—
	DC - 2.0 GHz	dB	27	30	—
	DC - 3.0 GHz	dB	21	24	—
VSWR	DC - 1.0 GHz	—	—	1.2:1	1.3:1
	DC - 2.0 GHz	—	—	1.3:1	1.4:1
	DC - 3.0 GHz	—	—	1.7:1	1.9:1
$T_{rise}$ $T_{fall}$ $T_{on}$ $T_{off}$ Transients	10%/90%, 90%/10% <sup>2</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	—	+25	—
	.5 - 3.0 GHz	dBm	—	+30	—
Input IP <sub>3</sub>	Two tone inputs 0.05 GHz	dBm	—	+40	—
	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	—

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

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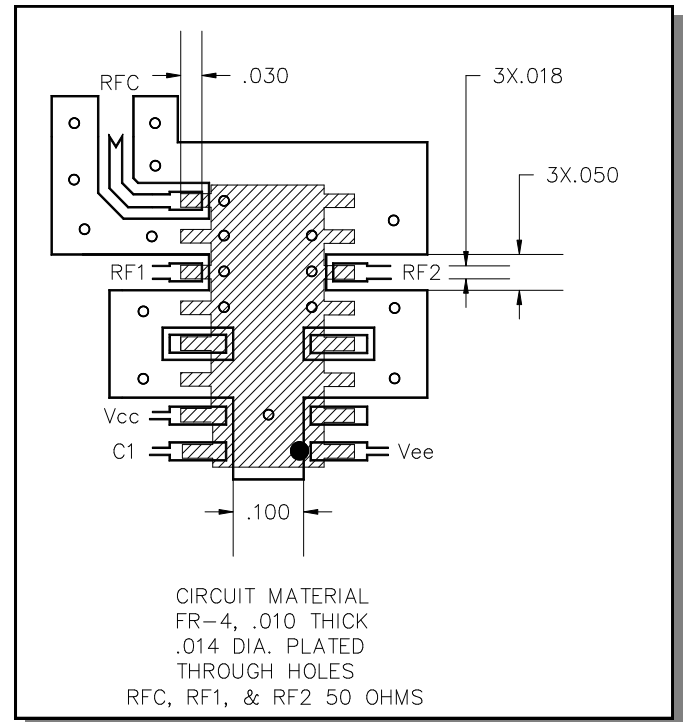
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### Absolute Maximum Ratings<sup>3,4</sup>

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 3.0 GHz <sup>5</sup>	+27 dBm +34 dBm
$V_{CC}$	$-0.5V \leq V_{CC} \leq +7.0V$
$V_{EE}$	$-8.5V \leq V_{EE} \leq +0.5V$
$V_{CC} - V_{EE}$	$-0.5V \leq V_{CC} - V_{EE} \leq 14.5V$
$V_{in}$ <sup>6</sup>	$-0.5V \leq V_{in} \leq V_{CC} + 0.5V$
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.

### Recommended PCB Configuration



### 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.

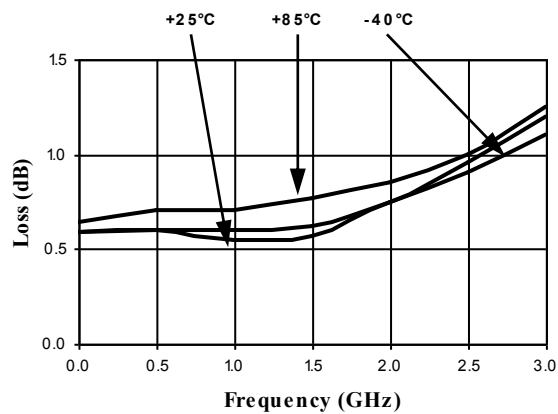
### Truth Table (Switch)

C1	RF1	RF2
0	On	Off
1	Off	On

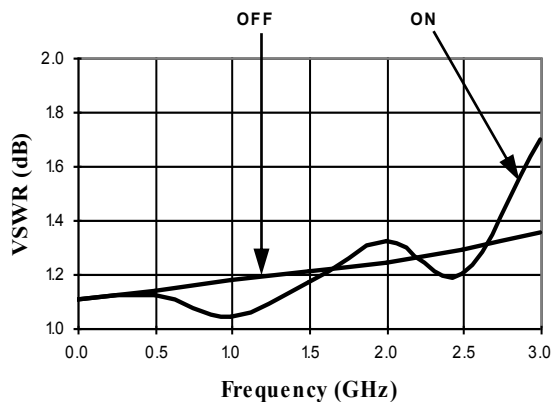
0 = TTL Low; 1 = TTL High

## Typical Performance Curves

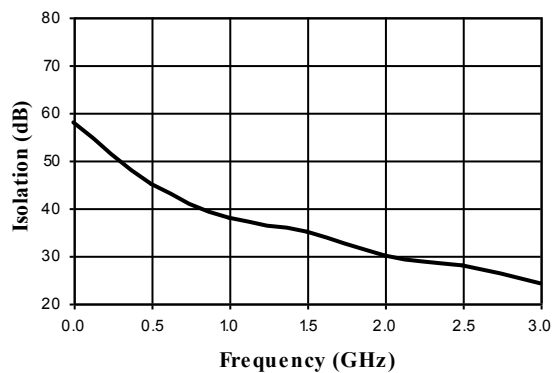
Typical Insertion Loss (dB)



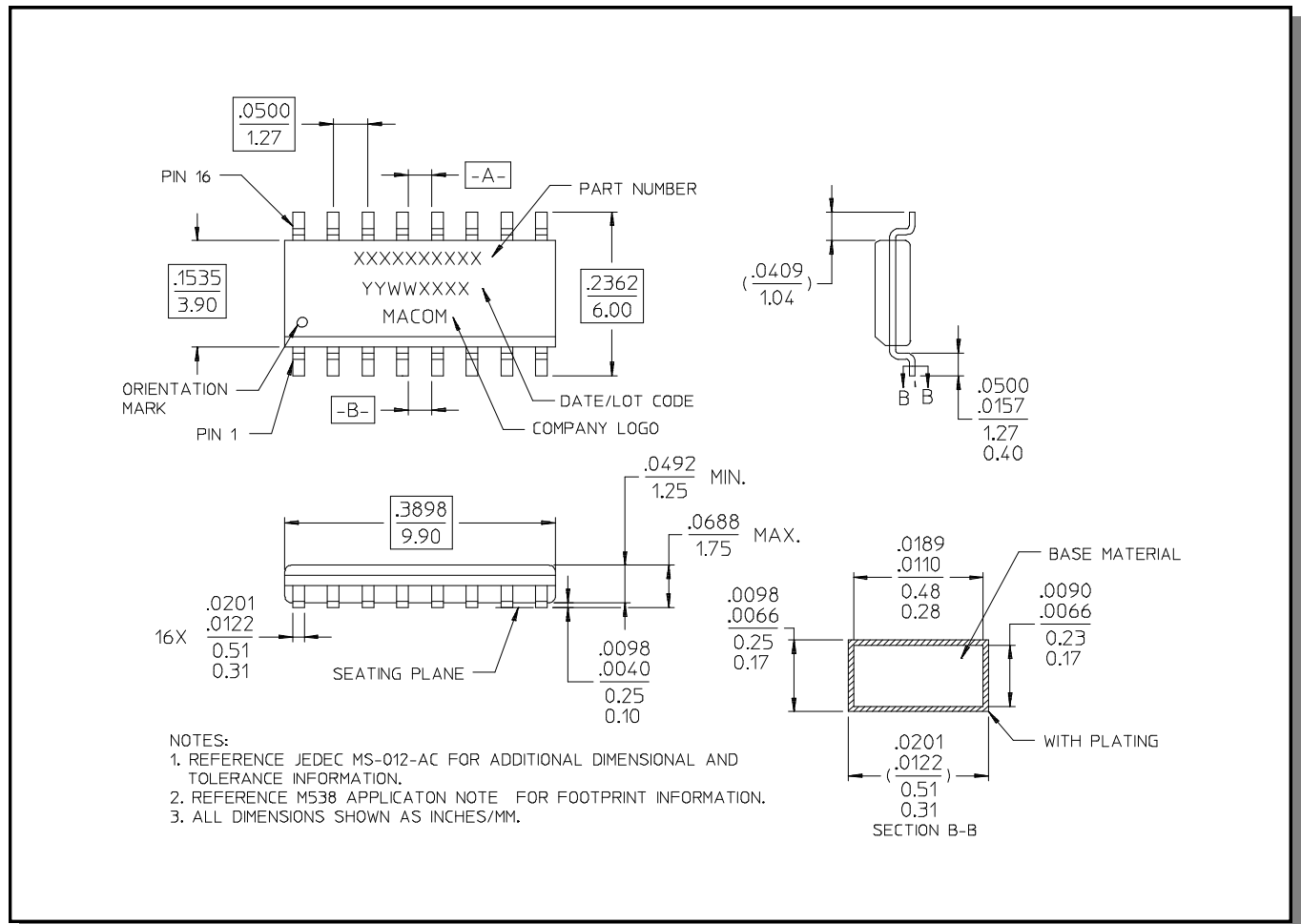
Typical VSWR



Typical Isolation (dB)



### Lead-Free, SOIC-16<sup>†</sup>



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

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