

# GaAs SP4T Absorptive Switch with ASIC Driver, DC-3.0 GHz

**MASW-007073-000100  
V1**

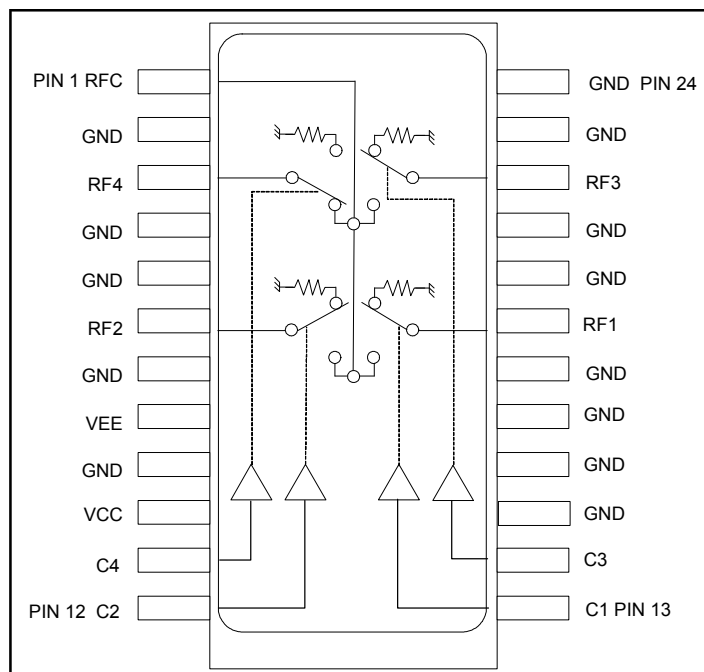
## Features

- Typical Isolation: 33 dB (2,000 MHz)
- Typical Insertion Loss: 1.6 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 SW65-0314

## Description

M/A-COM's MASW-007073-000100 is a GaAs MMIC absorptive SP4T 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-007073-000100 is ideally suited for wireless infrastructure applications. Also available in a ceramic package with improved performance.

## Functional Block Diagram



## Pin Configuration

Pin No.	Function	Pin No.	Function
1	RFC	13	C1
2	GND	14	C3
3	RF4	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	RF3
11	C4	23	GND
12	C2	24	GND

## Ordering Information

Part Number	Package
MASW-007073-000100	Bulk Packaging
MASW-007073-0001TR	1000 piece reel
MASW-007073-0001TB	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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**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	—	1.5	1.7
	DC - 2.0 GHz	dB	—	1.6	1.8
	DC - 3.0 GHz	dB	—	2.0	2.3
Isolation (One Arm On)	DC - 1.0 GHz	dB	35	38	—
	DC - 2.0 GHz	dB	27	33	—
	DC - 3.0 GHz	dB	25	27	—
VSWR	DC - 1.0 GHz	—	—	<b>On</b> 1.3:1	1.5:1
	DC - 2.0 GHz	—	—	1.5:1	2.0:1
	DC - 3.0 GHz	—	—	1.7:1	2.4:1
$T_{rise}$ $T_{fall}$ $T_{on}$ $T_{off}$ 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
I <sub>CC</sub>	V <sub>CC</sub> = +5.0V	mA	—	0.2	6
I <sub>EE</sub>	V <sub>EE</sub> = -5.0V	mA	—	-0.2	-1
Logic "0"	I <sub>in</sub> = 20 $\mu$ A max	V	0.0	—	0.8
Logic "1"	I <sub>in</sub> = 20 $\mu$ A max	V	2.0	—	5.0

1. Decoupling capacitors (.01  $\mu$ 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
Bias Voltages V <sub>EE</sub> V <sub>CC</sub> Control Voltage <sup>5</sup>	-8.5V $\leq$ V <sub>EE</sub> $\leq$ 0.5V -0.5V $\leq$ V <sub>CC</sub> $\leq$ +5.5V -0.5V to 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.

- North America** Tel: 800.366.2266 / Fax: 978.366.2266
- Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

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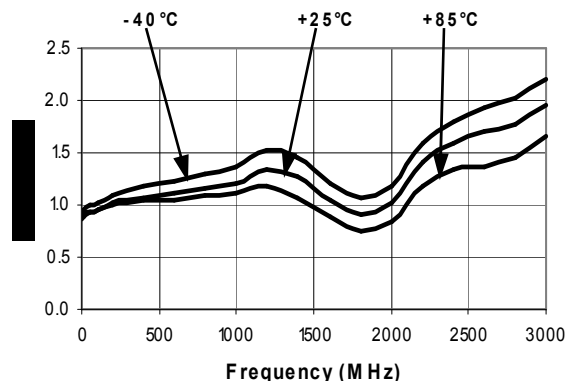
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**Truth Table**

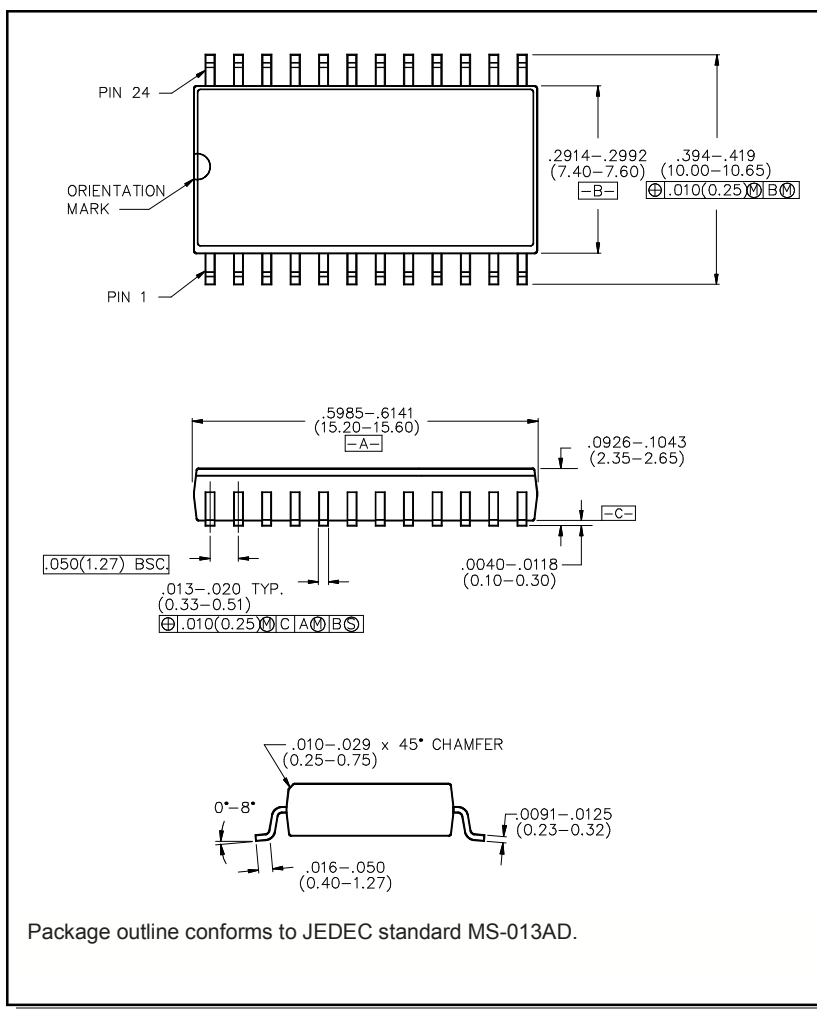
TTL Control Input				RF Common To:			
C1	C2	C3	C4	RF1	RF2	RF3	RF4
1	0	0	0	On	Off	Off	Off
0	1	0	0	Off	On	Off	Off
0	0	1	0	Off	Off	On	Off
0	0	0	1	Off	Off	Off	On

**Typical Performance Curves**

*Typical Insertion Loss Variation at Temperature - Jx-J0*



**Lead-Free, SOW-24<sup>†</sup>**



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