

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

Rev. V4

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

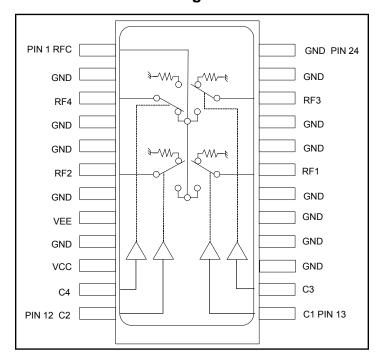
M/A-COM's MASW-007073-000100 is a GaAs MMIC absorptive SP4T switch with an integral silicon ASIC driver. This device is in a 24-lead plastic package. This switch offers excellent broadband performance and repeatability from DC to 3 GHz, while maintaining low DC power dissipation. The MASW-007073-000100 is ideally suited for wireless infrastructure applications. Also available in a ceramic package with improved performance.

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.

Functional Block Diagram



Pin Configuration

Pin No.	in No. Function Pin N		Function	
1	RFC	13	C1	
2	GND	14	C3	
3	RF4	15	GND	
4	GND	16	GND	
5	5 GND		GND	
6	RF2	RF2 18		
7	7 GND 19		RF1	
8	V _{EE}	20	GND	
9	GND	21	GND	
10	V _{CC}	22	RF3	
11	C4	23	GND	
12	C2	24	GND	

^{*} Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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Electrical Specifications: $T_A = 25$ °C, $Z_0 = 50\Omega$

Parameter	Test Conditions	Units	Min	Тур	Max
Insertion Loss	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	dB dB dB		1.5 1.6 2.0	1.7 1.8 2.3
Isolation (One Arm On)	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	dB dB dB	35 27 25	38 33 27	
VSWR	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	_ _ _	_ _ _	On Off 1.3:1 1.3:1 1.5:1 1.7:1 1.7:1 2.2:1	1.5:1 2.0:1 2.4:1
T _{rise} T _{fall} T _{on} T _{off} Transients	10%/90%, 90%/10% ¹ 50% TTL to 90%/10% RF In-band (peak to peak)	ns ns mV		15 50 50	50 150 150
1 dB Compression	.05 GHz .5 - 3.0 GHz	dBm dBm	_	+20 +27	
Input IP3	Two tone inputs 0.05 GHz Up to +5 dBm 0.5 - 3.0 GHz				
Vcc	_	V +4.5 +5.0			+5.5
VEE	_	V	-8.0	-5.0	-4.75
V _{IL} V _{IH}	LOW-level input voltage HIGH-level input voltage				0.8 5.0
lin (Input Leakage Current)	Vin = V _{CC} or GND	Vin = V _{CC} or GND			1.0
I _{CC} (Quiescent Supply Current)	Vcntrl = V _{CC} or GND uA — 250			400	
ΔI _{CC} (Additional Supply Current Per TTL Input Pin)	V _{CC} = Max, Vcntrl = V _{CC} - 2.1V	mA	_	_	1.0
lee	IEE VEE min to max, Vin = V_{IL} or V_{IH} mA -1.0 -0.2			-0.2	_

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

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum		
Max. Input Power 0.05 GHz 0.5 - 3.0 GHz ⁴	+27 dBm +34 dBm		
V _{CC}	-0.5V ≤ V _{CC} ≤ +7.0V		
V _{EE}	-8.5V ≤ V _{EE} ≤ +0.5V		
V _{CC} - V _{EE}	$-0.5V \le V_{CC} - V_{EE} \le 14.5V$		
Vin ⁵	-0.5V ≤ Vin ≤ V _{CC} + 0.5V		
Operating Temperature	-40°C to +85°C		
Storage Temperature	-65°C to +125°C		

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.

- 2. 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.
- 4. 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.

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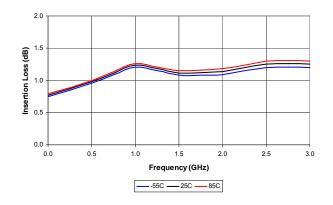
Truth Table

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

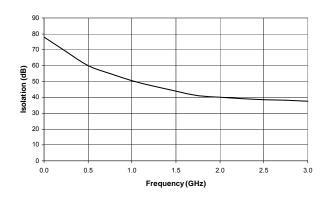
0 = TTL Low; 1 = TTL High

Typical Performance Curves

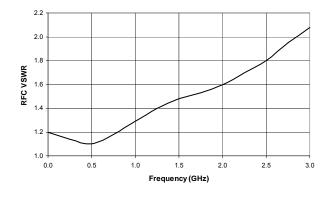
Insertion Loss vs. Frequency



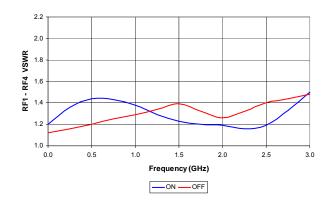
Isolation Loss vs. Frequency



RFC VSWR vs. Frequency



RF1-RF4 VSWR vs. Frequency



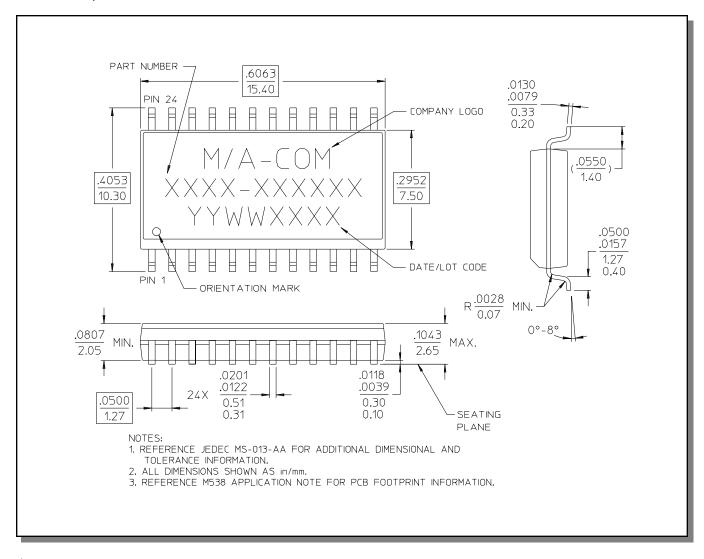
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Lead-Free, SOW-24[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.

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