MASW-007072-000100

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

Rev. V3

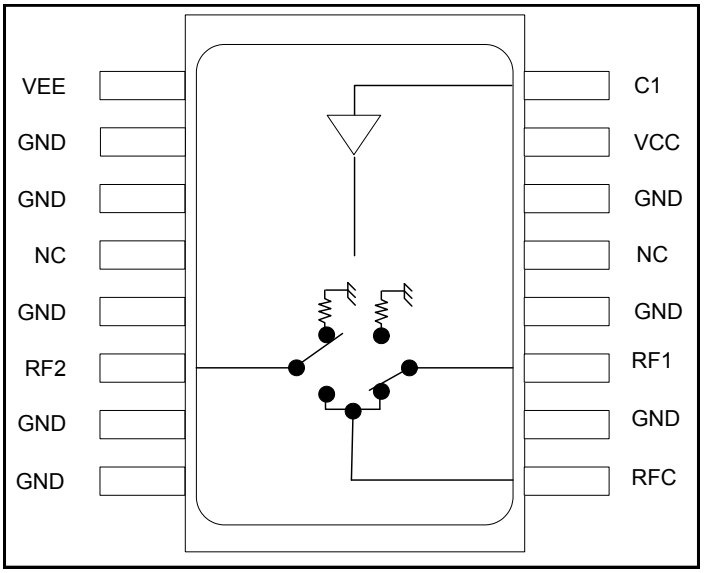
Features

- 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[1]

Pin No.	Function	Pin No.	Function
1	V_{EE}	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_{CC}
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.

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

Electrical Specifications: T_A = 25°C, Z_0 = 50Ω

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	dB dB dB	— — —	0.6 0.75 1.2	0.75 0.90 1.45
Isolation (All arms off)	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	dB dB dB	35 27 21	38 30 24	— — —
VSWR	DC - 1.0 GHz DC - 2.0 GHz DC - 3.0 GHz	— — —	— — —	1.2:1 1.3:1 1.7:1	1.3:1 1.4:1 1.9:1
T_{rise} T_{fall} T_{on} T_{off} Transients	10%/90%, 90%/10%[2] 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	— —	+25 +30	— —
Input IP_3	Two tone inputs 0.05 GHz Up to +5 dBm 0.5 - 3.0 GHz	dBm dBm	— —	+40 +46	— —
V_{CC}	—	V	+4.5	+5.0	5.5
V_{EE}	—	V	-8.0	-5.0	-4.75
V_{IL} V_{IH}	LOW-level input voltage HIGH-level input voltage	V V	0.0 2.0	— —	0.8 5.0
Iin (Input Leakage Current)	Vin = V_{CC} or GND	uA	-1.0	—	1.0
Icc (Quiescent Supply Current)	Vcntrl = V_{CC} or GND	uA	—	250	400
ΔIcc (Additional Supply Current Per TTL Input Pin)	V_{CC} = Max, Vcntrl = V_{CC} - 2.1 V	mA	—	—	1.0
I_{EE}	V_{EE} min to max, Vin = V_{IL} or V_{IH}	mA	-1.0	-0.2	—

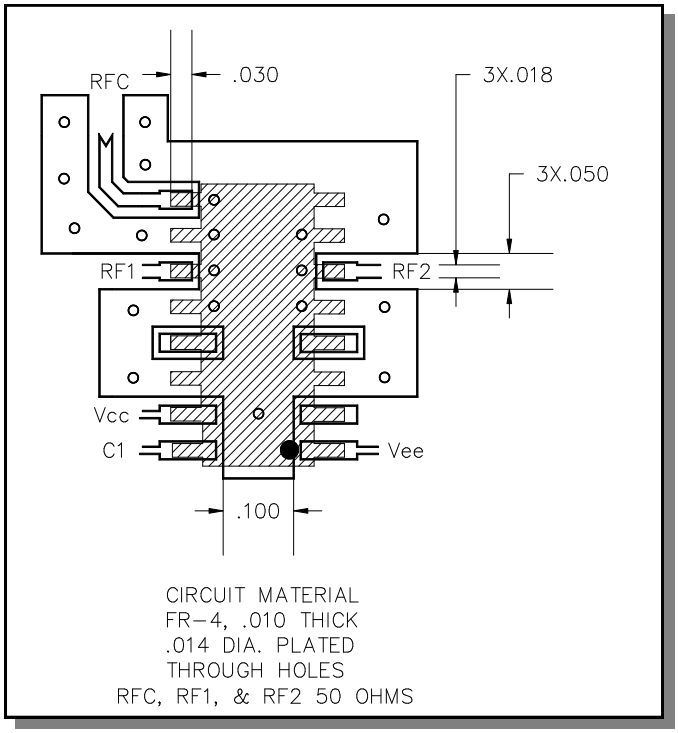
2. Decoupling capacitors (.01 µF) are required on the power supply lines.

Absolute Maximum Ratings[3,4]

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 3.0 GHz[5]	 +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 ≤ V_{CC} - V_{EE} ≤ 14.5V
Vin[6]	-0.5V ≤ Vin ≤ V_{CC} + 0.5V
Operating Temperature	-40ºC to +85ºC
Storage Temperature	-65ºC to +125ºC

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM does not recommend sustained operation near these survivability limits.
5. When the RF input is applied to the terminated port, the absolute maximum power is +30 dBm.
6. 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.

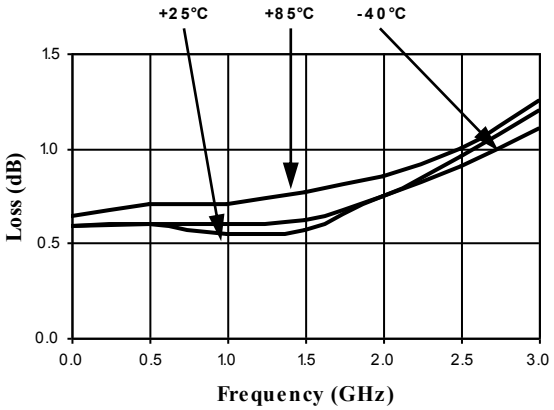
Truth Table (Switch)

C1	RF1	RF2
0	On	Off
1	Off	On

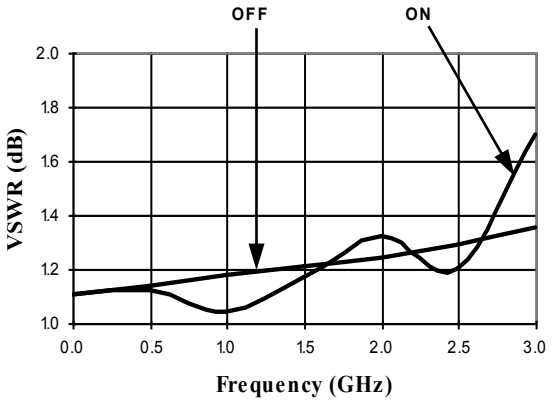
0 = TTL Low; 1 = TTL High

Typical Performance Curves

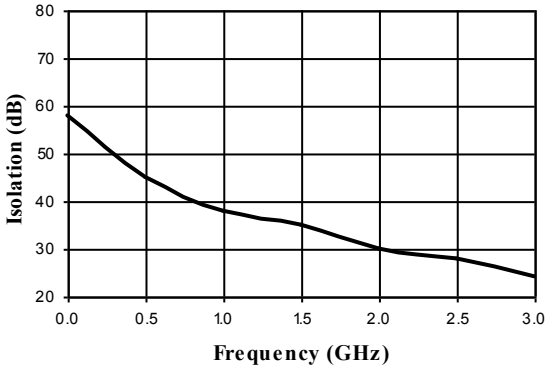
Typical Insertion Loss (dB)



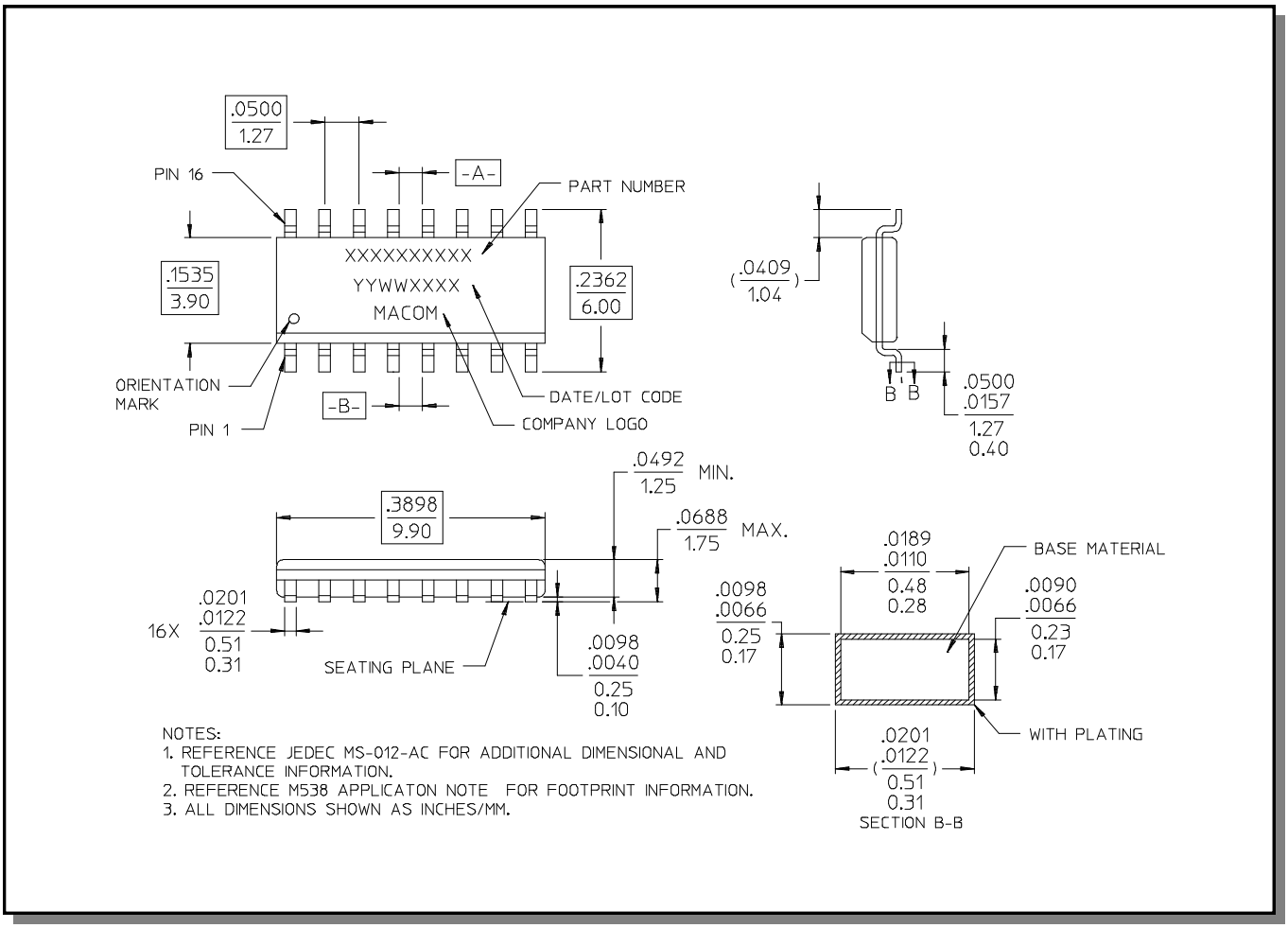
Typical VSWR



Typical Isolation (dB)



Lead-Free, SOIC-16†



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