

**GaAs High Isolation Switch
DC - 3.0 GHz**

**MASWSS0169
V2**

Features

- Low Power Consumption: < 20 μ A @ +3 V
- High Isolation: 50 dB Typical @ 2 GHz
- Low Insertion Loss: 0.7 dB @ 2 GHz
- Positive 2.5 to 5 V Control
- Lead-Free MSOP-10 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of SW-439

Description

M/A-COM's MASWSS0169 is a GaAs MMIC SPDT switch in a lead-free MSOP-10 surface mount plastic package. This part is ideal for high isolation, broadband switching requirements. Typical applications include synthesizer switching, transmit/receive switching, switch matrices and filter banks in systems such as radio and cellular equipment, PCM, GPS, and fiber optic modules.

The MASWSS0169 is fabricated as a monolithic GaAs MMIC using a 0.5 micron PHEMT process. The process features full passivation.

Ordering Information

Part Number	Package
MASWSS0169	Bulk Packaging
MASWSS0169TR-3000	3000 piece reel
MASWSS0169SMB	Sample Board

Note: Reference Application Note M513 for reel size information.

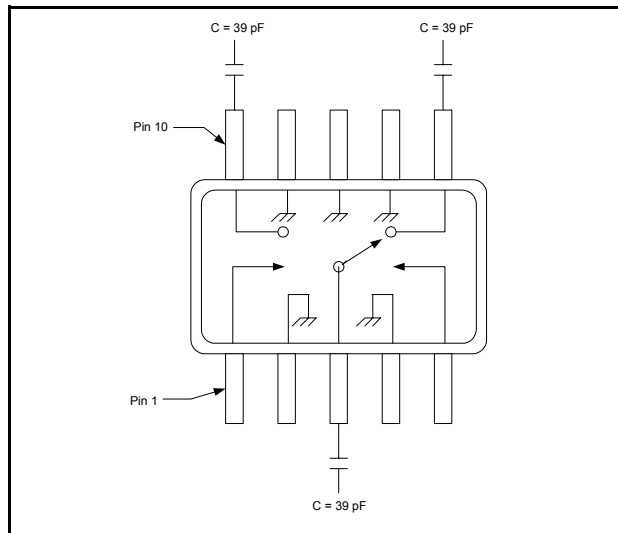
Absolute Maximum Ratings ^{1,2}

Parameter	Absolute Maximum
Input Power	+30 dBm
Operating Voltage	+8.5 Volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. M/A-COM does not recommend sustained operation near these survivability limits.

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

Functional Schematic ³



3. For improved performance at frequencies below 500 MHz, use larger value capacitors.

Pin Configuration

Pin No.	Function	Pin No.	Function
1	Control 1	6	RF Port 2
2	Ground	7	Ground
3	RF Input	8	Ground
4	Ground	9	Ground
5	Control 2	10	RF Port 1

Truth Table ^{4,5}

Control V1	Control V2	RFC - RF1	RFC - RF2
0	1	Off	On
1	0	On	Off

4. External DC blocking capacitors are required on all RF ports.
5. "0" = 0 ± 0.2 Vdc, "1" = +2.5 to +5 Vdc

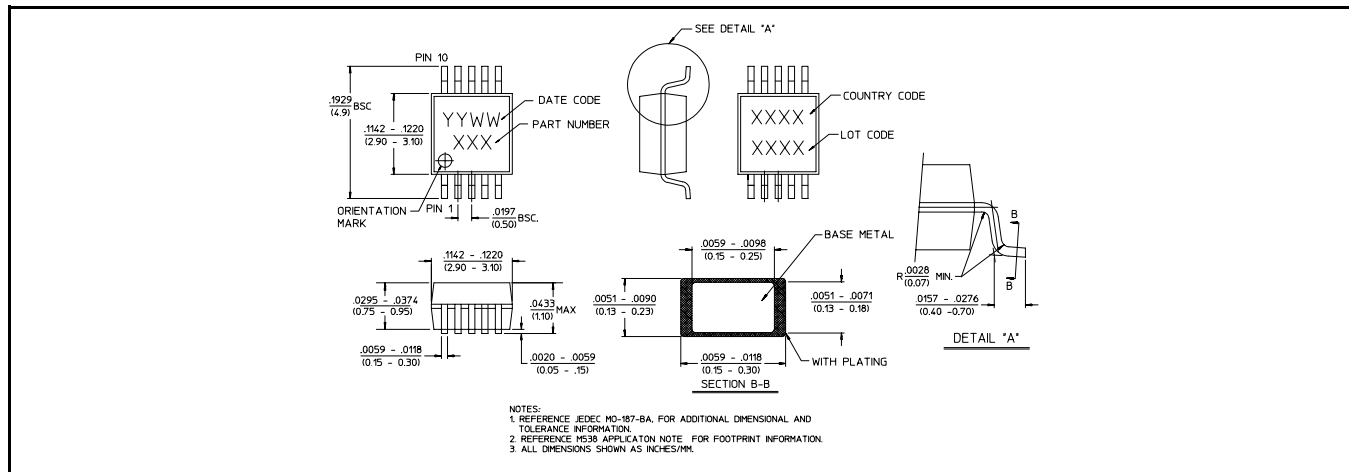
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Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_C = 0 / 3 \text{ V}$, $Z_0 = 50\Omega$

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	500 MHz - 1.0 GHz	dB	—	0.55	0.65
	1.0 - 2.0 GHz	dB	—	0.65	—
	2.0 - 3.0 GHz	dB	—	0.80	—
Isolation	500 MHz - 2.0 GHz	dB	45	47	—
	2.0 - 3.0 GHz	dB	—	33	—
VSWR	0.25 - 3.0 GHz	Ratio	—	1.2:1	—
P1dB	500 MHz - 2.0 GHz, $V_C = 3 \text{ V}$	dBm	—	20	—
P1dB	500 MHz - 2.0 GHz, $V_C = 5 \text{ V}$	dBm	—	28	—
IP2	2 Tone, 900 MHz, 5 MHz Spacing, $V_C = 3 \text{ V}$	dBm	—	85	—
IP3	2 Tone, 900 MHz, 5 MHz Spacing, $V_C = 3 \text{ V}$	dBm	—	50	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	20	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	10	—
Transients	In-band	mV	—	15	—
Control Current	$ V_C = 3.0 \text{ V}$	μA	—	5	20

Lead-Free MSOP-10[†]



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

Handling Procedures

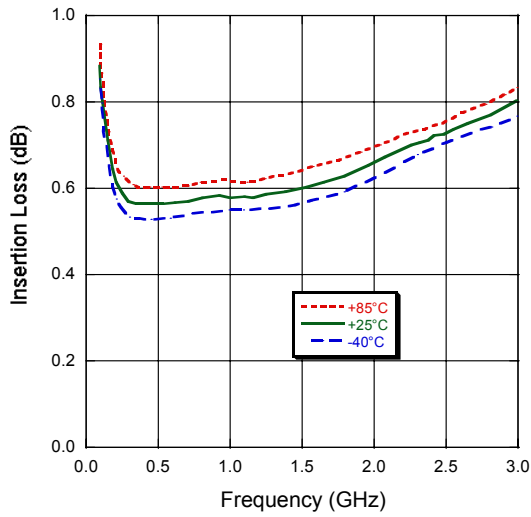
Please observe the following precautions to avoid damage:

Static Sensitivity

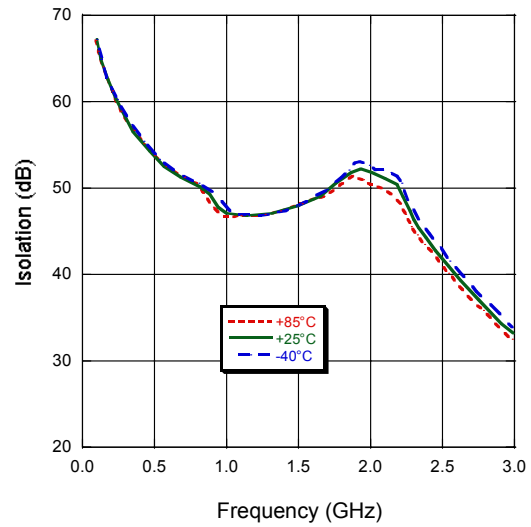
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Typical Performance Curves

Insertion Loss



Isolation



VSWR

