

Features

- 75 Ohms
- Positive Voltage Control (0 / +5 V)
- Non-reflective
- Low Insertion Loss 0.74 dB at 870 MHz
- High Isolation 52 dB at 870 MHz
- 4 mm FQFP-N 20 Lead Package
- 0.5 micron GaAs pHEMT Process

Description

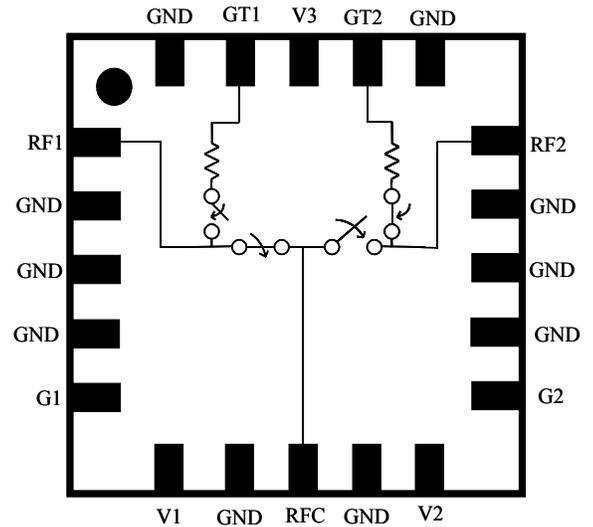
M/A-COM's MASWSS0069 is a GaAs PHEMT MMIC single pole double throw (SPDT) switch in a low cost miniature 4 mm FQFP-N 20 Lead package. The MASWSS0069 is ideally suited for applications where low control voltage, low insertion loss, high isolation, small size and low cost are required. A typical application is to replace mechanical relays in CATV systems. This device has an additional state where both arms are off and the device maintains a terminated and isolated state. This state is achieved using a third control line. The MASWSS0069 can be used in all 75 ohm systems operating up to 1 GHz.

The MASWSS0069 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information

Part Number	Package
MASWSS0069	FQFP-N 20 Lead Plastic Package
MASWSS0069TR	7 inch, 1000 piece reel
MASWSS0069SMB	Sample Test Board

Functional Schematic



Absolute Maximum Ratings ^{1,2}

Parameter	Absolute Maximum
Max Input Power (5 - 1000 MHz, 2.5V Control)	+32 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.
2. * RFC Port is reflective in 'All Off' state.

Pin Configuration ¹

PIN No.	PIN Name	Description
1	RF1	RF In/Out
2	GND	Ground
3	GND	Ground
4	GND	Ground
5	G1	RF Ground
6	V1	Control 1
7	GND	Ground
8	RFC	RF In/Out
9	GND	Ground
10	V2	Control 2
11	G2	RF Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	RF2	RF In/Out
16	GND	Ground
17	GT2	RF Ground
18	V3	Control 3
19	GT1	RF Ground
20	GND	Ground

- Center paddle should be connected to ground.

Truth Table ²

V1	V2	V3	RFC - RF1	RFC - RF2
+2.5 to +5V	0 ± 0.2V	0 ± 0.2V	On	Off
0 ± 0.2V	+2.5 to +5V	0 ± 0.2V	Off	On
0 ± 0.2V	0 ± 0.2V	+2.5 to +5V	Off	Off

- External 0.01 uF DC blocking capacitors are required on all RF In/Out and all RF Ground ports.

Handling Procedures

The following precautions should be observed to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are ESD sensitive and can be damaged by static electricity. Proper ESD techniques should be used when handling these devices.

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■ **North America:** Tel. (800) 366-2266
 ■ **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
 ■ **Europe:** Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 75 \Omega$

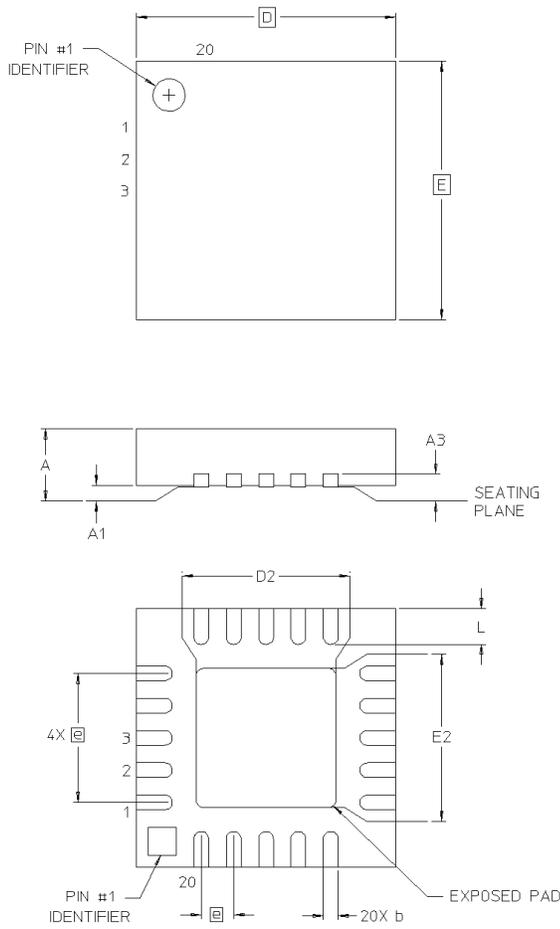
Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	5 - 50 MHz	dB		0.45	
	50 - 1000 MHz	dB		0.80	
Isolation (One Arm On)	5 - 50 MHz	dB		70	
	50 - 1000 MHz	dB		51	
Isolation (All Arms Off)	5 - 50 MHz	dB		70	
	50 - 1000 MHz	dB		55	
Return Loss (On)	5 - 50 MHz	dB		33	
	50 - 1000 MHz	dB		20	
Return Loss *(Off)	5 - 50 MHz	dB		33	
	50 - 1000 MHz	dB		22	
IP3	Two Tone -10 dBm, 6 MHz Spacing, > 50 MHz $V_c = 0V/5V$	dBm		52	
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS		20	
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	nS		40	
Transients	In Band	mV		30	
Gate Leakage	$ V_c = 2.5V$	uA		14	

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4 mm FQFP-N 20 Lead Saw Singulated



DIMENSION SYMBOL	MEASUREMENT (mm)		
	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0	0.02	0.05
A3	0.25 REF		
b	0.18	0.23	0.30
D	4.00 BSC		
D2	0.75	1.70	2.25
e	0.50 BSC		
E	4.00 BSC		
E2	0.75	1.70	2.25
L	0.35	0.55	0.75

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