SPST High Isolation CATV Switch 5 - 1000 MHz

Features

- 75 Ohm Impedance
- Positive Voltage Control (0 / +5 V)
- Input Terminated (Off State)
- Low Insertion Loss: 0.62 dB at 870 MHz
- High Isolation: 54 dB at 870 MHz
- 3 mm FQFP-N 12 Lead Package
- 0.5 micron GaAs PHEMT Process

Description

M/A-COM's MASWSS0067 is a GaAs PHEMT MMIC single pole single throw (SPST) switch in a low cost 3 mm FQFP-N 12 lead package. The MASWSS0067 is ideally suited for applications where low control voltage, low insertion loss, high isolation, small size and low cost are required. Typical applications are to replace mechanical relays in CATV systems. This part can be used in all 75 ohm systems operating up to 1.0 GHz.

The MASWSS0067 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

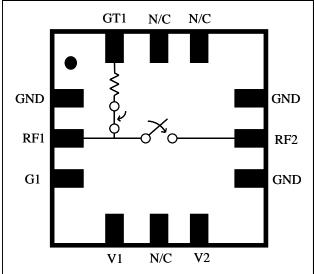
Ordering Information¹

1

Part Number	Package
MASWSS0067	FQFP-N 12-lead Plastic Package
MASWSS0067TR	7 inch, 1000 piece reel
MASWSS0067TR-3000	13 inch, 3000 piece reel
MASWSS0067SMB	Sample Test Board (Includes 5 Samples)

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration²

PIN No.	PIN Name	Description	
1	GND	Ground	
2	RF1	RF In	
3	G1	RF Ground	
4	V1	Control 1	
5	N/C	No Connection	
6	V2	Control 2	
7	GND	Ground	
8	RF2	RF Out	
9	GND	Ground	
10	N/C	No Connection	
11	N/C	No Connection	
12	GT1	RF Ground	

2. The exposed pad centered on the package bottom must be connected to both RF and DC ground.

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 - Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
 - Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298

and/or prototype measurements. Commitment to develop is not guaranteed. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

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Electrical Specifications: $T_A = 25^{\circ}C$, $V_C = 0V / 5V$, $Z_0 = 75 \Omega^3$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	5 - 50 MHz 50 - 1000 MHz	dB dB	_	0.45 0.65	0.9
Isolation	5 - 50 MHz 50 - 1000 MHz	dB dB	 50	70 53	_
Return Loss (On)	5 – 50 MHz 50 – 1000 MHz	dB dB	_	30 16	_
Return Loss (Off) (RF1 only)	5 – 50 MHz 50 – 1000 MHz	dB dB	_	30 18	_
IP3	Two Tone, +10 dBm / tone, 6 MHz Spacing, > 50 MHz	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	_
Control Current	Vc = 5V	μA		10	25

3. External DC blocking capacitors are required on all RF ports.

Absolute Maximum Ratings ⁴

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		

4. Exceeding any one or combination of these limits may cause permanent damage to this device.

Truth Table ⁵

V1	V2 RF1—RF2		
1	0	On	
0	1	Off	

5. $0 = 0 \text{ V} \pm 0.2 \text{ V}$; $1 = \pm 2.5 \text{ V}$ to $\pm 5.0 \text{ V}$.

Qualification

Qualified to M/A-COM Specification Rel 201, Process Flow –2.

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. Use proper ESD control precautions when handling these devices.

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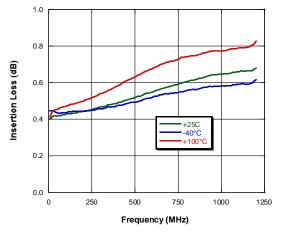
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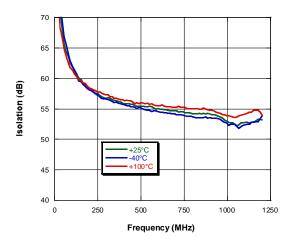
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Typical Performance Curves

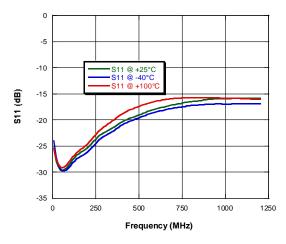
Insertion Loss vs. Frequency over Temperature



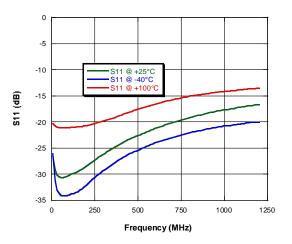
Isolation vs. Frequency over Temperature



S11 (Switch On) vs. Frequency over Temperature



S11 (Switch Off) vs. Frequency over Temperature



3

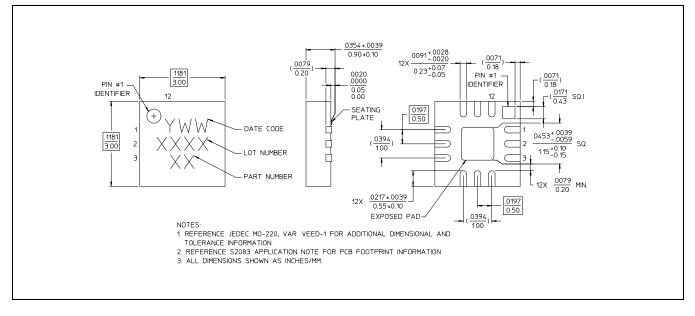
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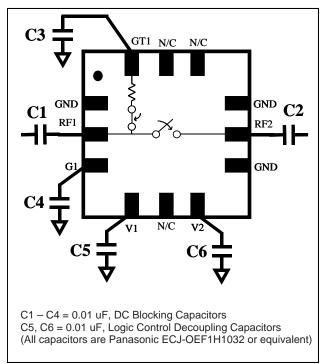
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3 mm PQFN 12 Lead



Application Schematic



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