MASW-008801



SPDT High Isolation CATV and Satellite Communications Switch 5 – 3000 MHz

M/A-COM Products Rev. V1

Features

- 75 Ω Impedance
- Input Terminated
- Positive Voltage Control
- High Isolation: 50 dB at 2500 MHz
- 0.5 micron GaAs pHEMT Process
- Achieve 80 dB isolation at 216 MHz
- Lead-Free 3 mm 16-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

The MASW-008801 is a GaAs pHEMT MMIC single pole double throw (SPDT) switch in a lead-free 3 mm 16-lead PQFN package. The MASW-008801 is ideally suited for applications where low control voltage, high isolation, small size and low cost are required.

Typical applications are to replace mechanical relays in CATV and satellite systems. This part can be used in all 75 Ω systems operating up to 3 GHz.

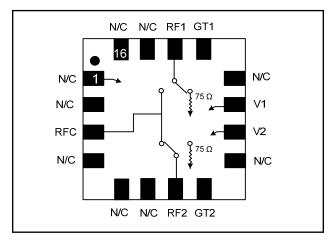
The MASW-008801 is fabricated using a 0.5 micron gate length GaAs pHEMT process. The process features full passivation for performance and reliability.

Ordering Information 1,2

Part Number	Package
MASW-008801-TR3000	3000 piece reel
MASW-008801-001SMB	Sample Board

- 1. Reference Application Note M513 for reel size information.
- 2. All sample boards include 5 loose parts.

Functional Schematic



Pin Configuration³

Pin No.	Pin Name	Description
1	N/C	No Connection
2	N/C	No Connection
3	RFC	RF Common Port
4	N/C	No Connection
5	N/C	No Connection
6	N/C	No Connection
7	RF2	RF Port 2
8	GT2	RF Ground
9	N/C	No Connection
10	V2	Vcontrol 2
11	V1	Vcontrol 1
12	N/C	No Connection
13	GT1	RF Ground
14	RF1	RF Port 1
15	N/C	No Connection
16	N/C	No Connection

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

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

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Electrical Specifications: $T_A = 25^{\circ}C$, $Z_0 = 75 \Omega^4$, $V_C = 0 V / 2.9 V$, $P_{IN} = 5 dBm$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	216 MHz 550 MHz 810 MHz 1000 MHz 2200 MHz 2500 MHz 3000 MHz	dB dB dB dB dB dB	— — — —	0.6 0.65 0.7 0.75 0.85 0.9	
Isolation RFC-RF1,RF2	216 MHz 550 MHz 810 MHz 1000 MHz 2200 MHz 2500 MHz 3000 MHz	dB dB dB dB dB dB	65 — 52 — 50	69 61 58 56 52 54 56	
Isolation RF1-RF2	216 MHz 550 MHz 810 MHz 1000 MHz	dB dB dB dB	80 — — 70	85 83 74 72	
Return Loss (on-state)	5 - 1000 MHz 5 - 2500 MHz	dB dB	_	14 12	_
Return Loss (off-state)	5 - 1000 MHz 5 - 2500 MHz	dB dB	_	18 18	_
Input P1dB	1000 MHz	dBm	_	24	_
IIP3	2 tone, 5 dBm/tone, 6MHz spacing, f1 & f2 = 988 & 994 MHz	dBm	_	47	_
IIP2	2 tone, 5 dBm/tone, 6MHz spacing, f1 & f2 = 988 & 994 MHz	dBm	_	90	_
CSO	CSO 132 channels, 18 dBmV/channel at the input			80	_
СТВ	CTB 132 channels, 18 dBmV/channel at the input Trise, Tfall 10% to 90% RF, 90% to 10% RF		_	80	_
Trise, Tfall			_	16	_
Ton, Toff 50% control to 90% RF, 50% control to 10% RF		ns	_	8	_
Transients	Transients In Band		_	70	_
Control Current V _C = 2.9 V		μA	_	5	10

^{4.} External 0.01 μF DC blocking capacitors are required on all RF In/Out and RF ground ports. See Application Schematic.

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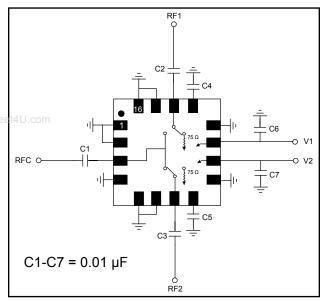
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Application Schematic



Truth Table 7

V1	V1 V2		11 V2 RFC - RF1		RFC - RF2	
1	0	On	Off			
0	1	Off	On			

7. 1 = +2.9 to +5 V, 0 = 0 + 0.2 V.

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.

Absolute Maximum Ratings 5,6

Parameter	Absolute Maximum
Input Power (5 - 3000 MHz, 2.9 V Control)	+32 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- Exceeding any one or combination of these limits may cause permanent damage.
- Tyco Electronics does not recommend sustained operation near these survivability limits.

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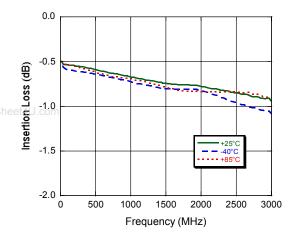


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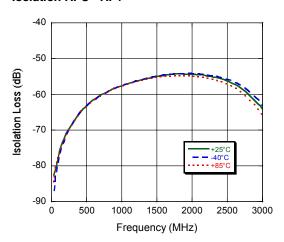
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Typical Performance Curves

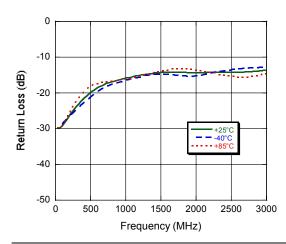
Insertion Loss RFC - RF1



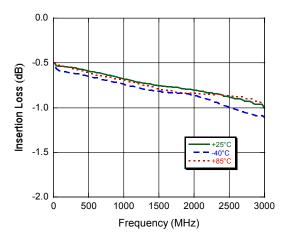
Isolation RFC - RF1



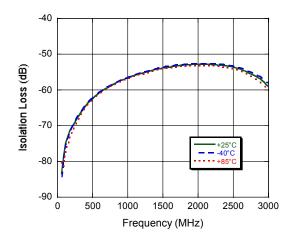
Return Loss On-state match



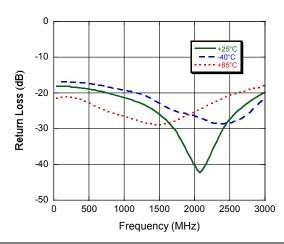
Insertion Loss RFC - RF2



Isolation RFC - RF2



Return Loss Off-state match



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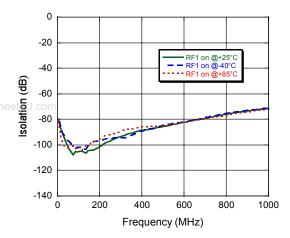


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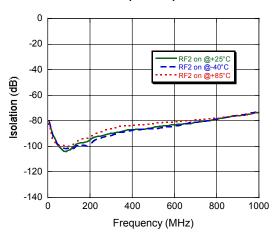
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Typical Performance Curves

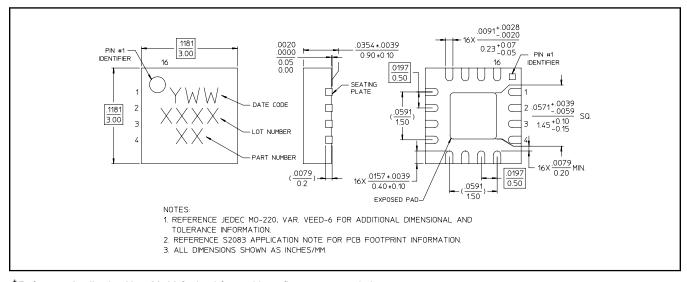
Isolation RF1 to RF2 (RF1 on)



Isolation RF1 to RF2 (RF2 on)



Lead-Free 3 mm 16-Lead PQFN[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations. Meets JEDEC moisture sensitivity level 1 requirements.

information contained herein without notice.

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