MASW-008153



SPDT High Isolation CATV Switch 5 – 1000 MHz

Rev. V2

Features

- 75 Ω Impedance
- Input Terminated
- Positive Voltage Control
- High Isolation: 65 dB at 870 MHz
- 0.5 micron GaAs PHEMT Process
- Lead-Free 4 mm 20-Lead PQFN Package
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MASW-008153 is a GaAs PHEMT MMIC single pole double throw (SPDT) switch in a lead-free 4 mm 20-lead PQFN package. MASW-008153 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 systems. This part can be used in all 75 Ω systems operating up to 1 GHz.

The MASW-008153 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}

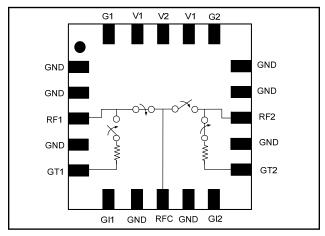
Part Number	Package
MASW-008153-TR3000	13 inch, 3000 piece reel
MASW-008153-001SMB	Sample Board 50 - 1000 MHz tuning

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

Commitment to produce in volume is not guaranteed.

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

Functional Schematic



Pin Configuration ³

Pin No.	Pin Name	Description		
1	GND	Ground		
2	GND	Ground		
3	RF1	RF Port 1		
4	GND	Ground		
5	GT1	RF Ground		
6	GI1	RF Ground		
7	GND	Ground		
8	RFC	RF Common Port		
9	GND	Ground		
10	GI2	RF Ground		
11	GT2	RF Ground		
12	GND	Ground		
13	RF2	RF Port 2		
14	GND	Ground		
15	GND	Ground		
16	G2	RF Ground		
17	V1	Control 1		
18	V2	Control 2		
19	V1	Control 1		
20	G1	RF Ground		

^{3.} The exposed pad centered on the package bottom must be connected to RF and DC ground.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not quaranteed. 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.

North America Tel: 800.366.2266 / Fax: 978.366.2266

Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298 Visit www.macomtech.com for additional data sheets and product information.



SPDT High Isolation CATV Switch 5 – 1000 MHz

Rev. V2

Electrical Specifications: $T_A = 25^{\circ}C$, $Z_0 = 75 \Omega^4$, $V_C = 0 V / 2.9 V$, $P_{IN} = 10 dBm$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	5 - 50 MHz 50 - 1000 MHz	dB dB	_	0.9 1.0	— 1.2
Isolation	5 - 50 MHz 50 - 1000 MHz	dB dB	<u> </u>	80 63	
Return Loss (On)	5 - 50 MHz 50 - 1000 MHz	dB dB	_ _	28 14	_ _
Return Loss (Off)	5 - 50 MHz 50 - 1000 MHz	dB dB	_	26 20	
IP3	Two Tone, +10 dBm/tone, 6 MHz spacing, > 50 MHz $$V_{\rm C}=0~{\rm V}~/~2.9~{\rm V}$ $V_{\rm C}=0~{\rm V}~/~5.0~{\rm V}$$	dBm dBm	_	47 52	
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	_	8	_
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	ns		18	
Transients	In Band	mV	_	70	
Control Current	V _C = 2.9 V	μΑ	_	5	10

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

Absolute Maximum Ratings 5,6

Parameter	Absolute Maximum		
Input Power (5 - 1000 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		

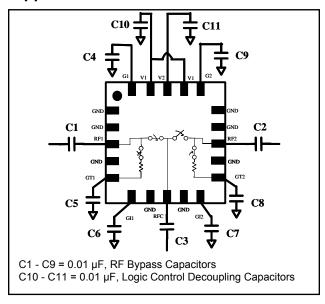
- Exceeding any one or combination of these limits may cause permanent damage.
- M/A-COM does not recommend sustained operation near these survivability limits.

Truth Table 7

V1	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.

Application Schematic



[•] Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

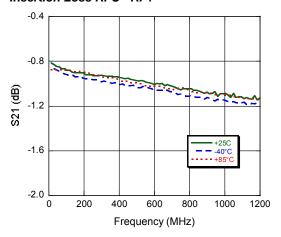


SPDT High Isolation CATV Switch 5 – 1000 MHz

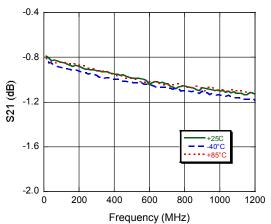
Rev. V2

Typical Performance Curves

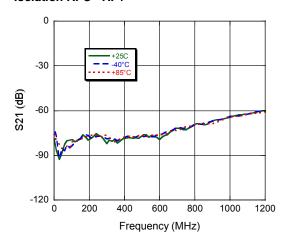
Insertion Loss RFC - RF1



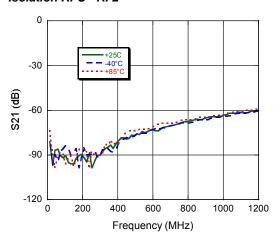
Insertion Loss RFC - RF2



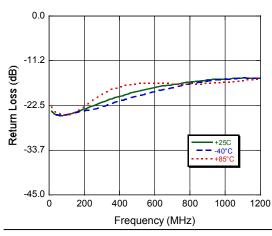
Isolation RFC - RF1



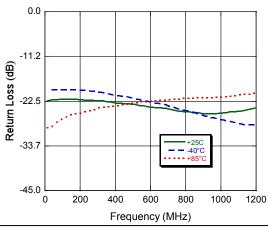
Isolation RFC - RF2



Return Loss On-state match



Return Loss Off-state match



- ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

 PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology
- 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.
- North America Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

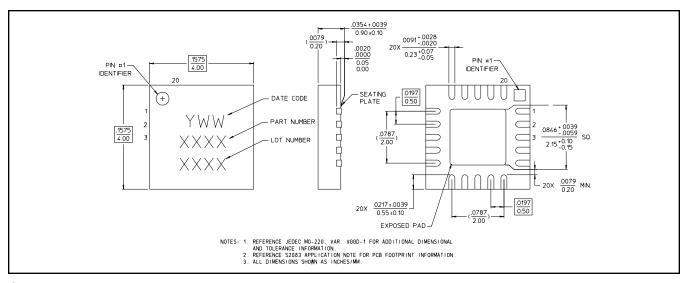
M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.



SPDT High Isolation CATV Switch 5 – 1000 MHz

Rev. V2

Lead-Free 4 mm 20-Lead PQFN[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations. Meets JEDEC moisture sensitivity level 1 requirements. Plating is 100% matte tin over copper.

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.

- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.