

SPDT High Isolation Terminated Switch 0.5 - 3.0 GHz

Rev. V3

Features

- Positive Voltage Control (0 / +5 V)
- High Isolation: 54 dB @ 0.9 GHz
52 dB @ 1.9 GHz
- 50-Ohm Internal Terminations
- Low Insertion Loss: 0.6 dB @ 0.9 GHz
0.7 dB @ 1.9 GHz
- Lead-Free Package: 4 mm 16-Lead PQFN
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of SW-475

Description

The M/A-COM MASWSS0121 GaAs monolithic switch provides high isolation in a low-cost, lead-free plastic surface mount package. The MASWSS0121 is ideal for applications across a broad range of frequencies including synthesizer switching, transmit / receive switching, switch matrices and filter banks in systems such as radio and cellular equipment, PCS, GPS, and fiber optic modules.

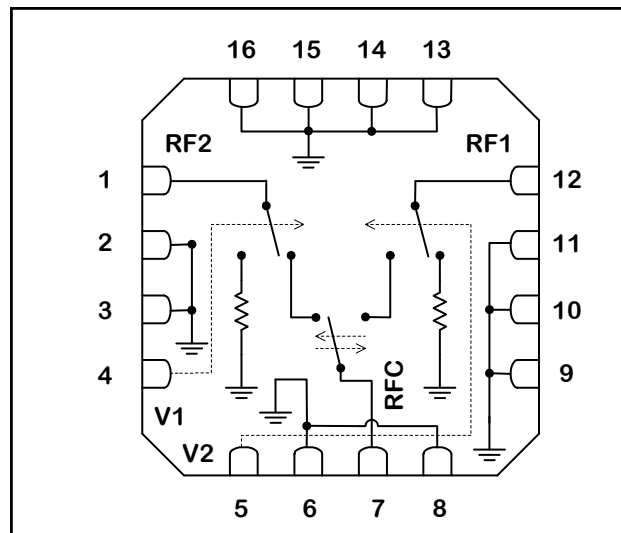
M/A-COM fabricates the MASWSS0121 using a 1.0-micron gate length MESFET process. The process features full chip passivation for performance and reliability.

Ordering Information ¹

Part Number	Package
MASWSS0121	Bulk Packaging
MASWSS0121TR	1000 piece reel
MASWSS0121TR-3000	3000 piece reel
MASWSS0121SMB	Sample board

1. Reference Application Note M513 for reel size information.

Functional Schematic



PIN Configuration

Pin	Function	Description
1	RF2	RF port
2	GND	RF ground
3	GND	RF ground
4	V1	Control 1
5	V2	Control 2
6	GND	RF ground
7	RFC	RF port
8	GND	RF ground
9	GND	RF ground
10	GND	RF ground
11	GND	RF ground
12	RF1	RF port
13	GND	RF ground
14	GND	RF ground
15	GND	RF ground
16	GND	RF ground
17 (pad) ²	GND	RF ground

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

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

SPDT High Isolation Terminated Switch 0.5 - 3.0 GHz

Rev. V3

Electrical Specifications: $T_A = 25\text{ }^{\circ}\text{C}$, $Z_0 = 50\text{ Ohms}$, $V_C = 0, 5.0\text{ V}^3$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5 - 1 GHz	dB	—	0.6	0.7
	1.0 - 2.0 GHz	dB	—	0.7	0.8
	2.0 - 3.0 GHz	dB	—	0.75	0.9
Isolation	0.5 - 1 GHz	dB	51	54	—
	1.0 - 2.0 GHz	dB	48	52	—
	2.0 - 3.0 GHz	dB	45	50	—
Return Loss	0.5 - 1 GHz	dB	—	20	—
	1.0 - 2.0 GHz	dB	—	20	—
	2.0 - 3.0 GHz	dB	—	20	—
Input IP_2	2-Tone 900 MHz, 5 MHz spacing	dBm	—	83	—
Input IP_3	2-Tone 900 MHz, 5 MHz spacing	dBm	—	46	—
P1dB	1 GHz, 5 V	dBm	—	27	—
	1 GHz, 3 V	dBm	—	18	—
P0.1dB	1 GHz, 5 V	dBm	—	24	—
	1 GHz, 3 V	dBm	—	11	—
T_{RISE} , T_{FALL}	10% to 90% RF & 90% to 10% RF	nS	—	24	—
T_{ON} , T_{OFF}	50% of V_C to 10 % / 90% RF	nS	—	15	—
Transients	$V_C = 5.0\text{ V}$ square wave, in-band	mV	—	12	—
Control Current	$ V_C = 4.5\text{ V}$, 0 dBm	μA	—	2	13

3. External DC blocking capacitors are required on all RF ports (47 pF capacitors are recommended).

Absolute Maximum Ratings^{4,5}

Parameter	Absolute Maximum
Input Power (0.5 - 3.0 GHz) 3 V Control 5 V Control	+30 dBm +33 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.
5. M/A-COM does not recommend sustained operation near these survivability limits.

Truth Table

V1	V2	RFC - RF1	RFC - RF2
0	1	ON	OFF
1	0	OFF	ON

Logic Level	Voltage Level
0	0 V \pm 0.2 V
1	3.0 V to 8.0 V

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

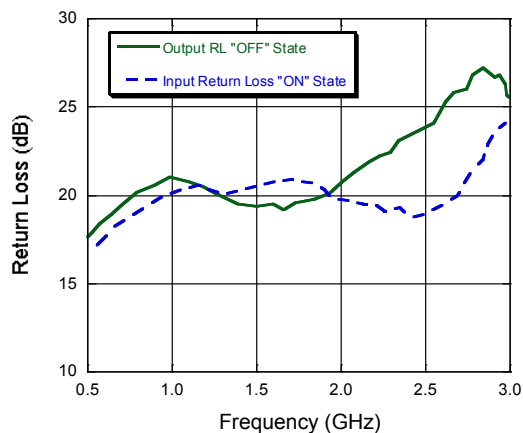
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

SPDT High Isolation Terminated Switch 0.5 - 3.0 GHz

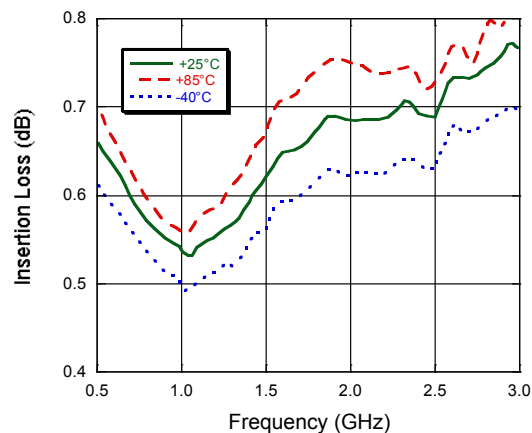
Rev. V3

Typical Performance Curves

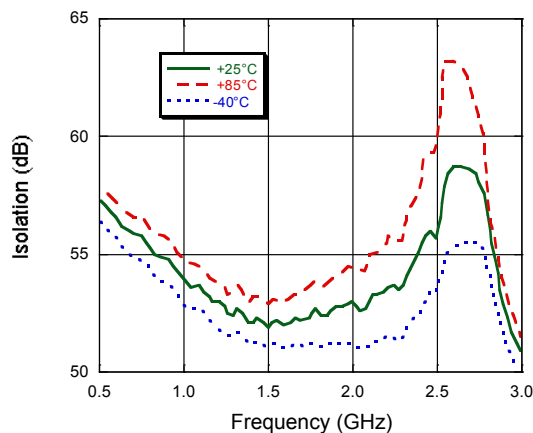
Return Loss



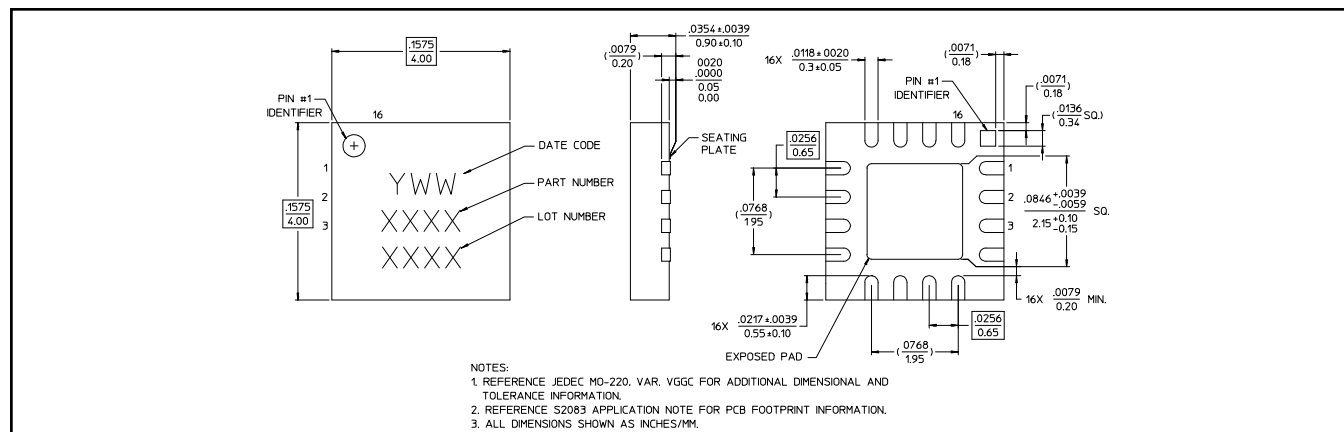
Insertion Loss Over Temperature



Isolation Over Temperature



Lead-Free 4 mm 16-Lead PQFN†



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

SPDT High Isolation Terminated Switch 0.5 - 3.0 GHz

Rev. V3

M/A-COM Technology Solutions Inc. All rights reserved.

Information in this document is provided in connection with M/A-COM Technology Solutions Inc ("MACOM") products. These materials are provided by MACOM as a service to its customers and may be used for informational purposes only. Except as provided in MACOM's Terms and Conditions of Sale for such products or in any separate agreement related to this document, MACOM assumes no liability whatsoever. MACOM assumes no responsibility for errors or omissions in these materials. MACOM may make changes to specifications and product descriptions at any time, without notice. MACOM makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. MACOM FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. MACOM SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[MACOM:](#)

[MASWSS0121TR-3000](#)