MASWSS0121

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.

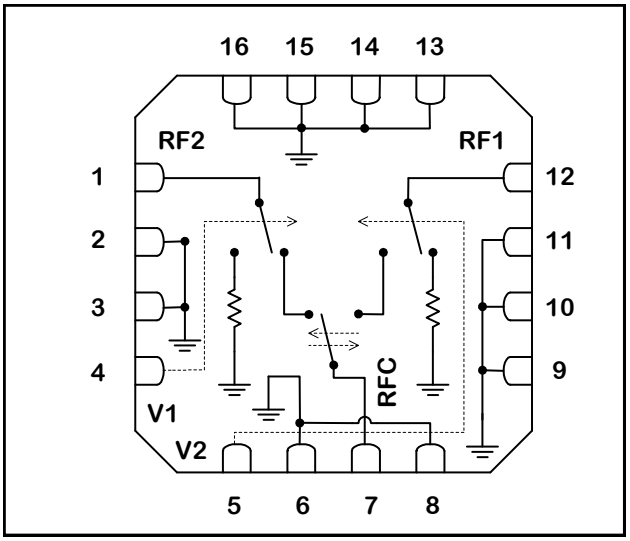
M/A-COM fabricates the MASWSS0121 using a 1.0-micron gate length MESFET process. The process features full chip passivation for performance and reliability.

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.

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0.5 - 3.0 GHz

Electrical Specifications: T_A = 25 °C, Z_0 = 50 Ohms, V_C = 0, 5.0 V [3]

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5- 1 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	— — —	0.6 0.7 0.75	0.7 0.8 0.9
Isolation	0.5 - 1 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	51 48 45	54 52 50	— — —
Return Loss	0.5 - 1 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	— — —	20 20 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 1 GHz, 3 V	dBm dBm	— —	27 18	— —
P0.1dB	1 GHz, 5 V 1 GHz, 3 V	dBm dBm	— —	24 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 V square wave, in-band	mV	—	12	—
Control Current	|Vc| = 4.5 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 ± 0.2 V
1	3.0 V to 8.0 V

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

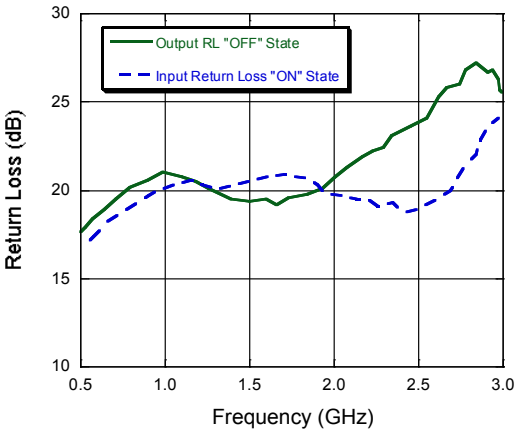
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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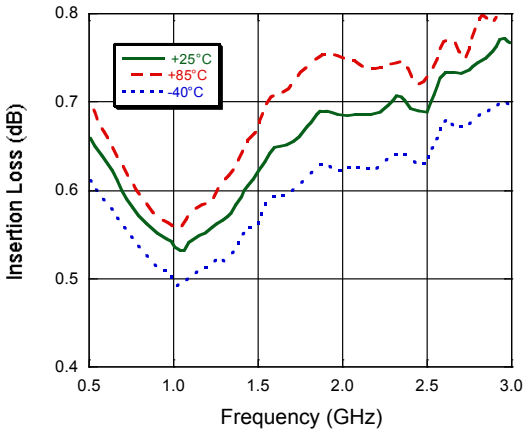
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Typical Performance Curves

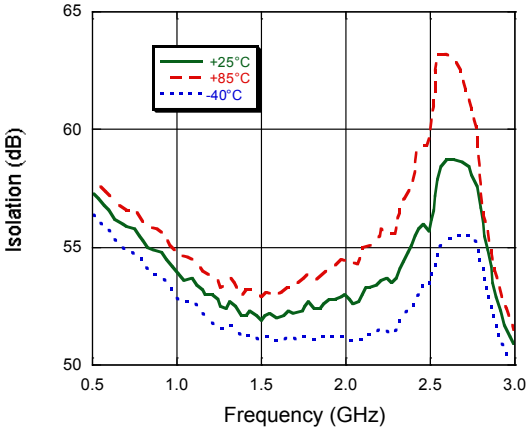
Return Loss



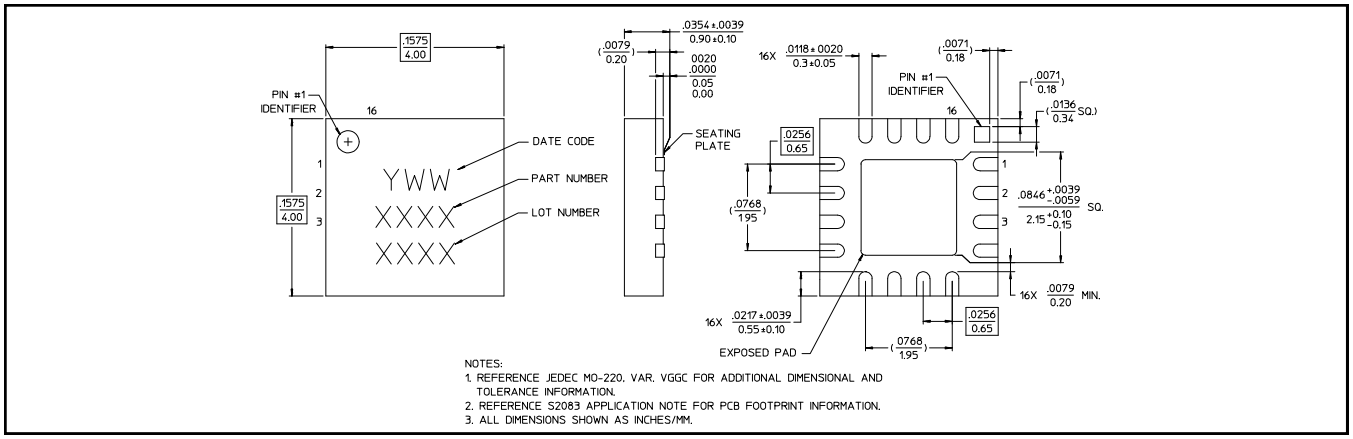
Insertion Loss Over Temperature



Isolation Over Temperature



Lead-Free 4 mm 16-Lead PQFN†



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

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