MASWSS0024

SPDT High Isolation Terminated Switch
0.01 - 3.0 GHz

Rev. V6

Features

- Positive Voltage Control: 0 / +5 V
- High Isolation: 55 dB typ. @ 0.9 GHz
  50 dB typ. @ 1.9 GHz
- 50-Ohm Internal Terminations
- Low Insertion Loss: 0.6 dB typ. @ 0.9 GHz,
  0.7 dB typ. @ 1.9 GHz
- MSOP-8-EP Package

Description

The M/A-COM MASWSS0024 GaAs monolithic switch provides high isolation in a low-cost, plastic surface mount package. The MASWSS0024 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.

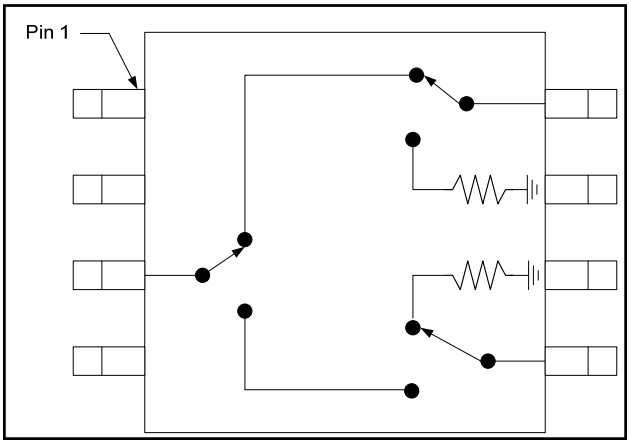
M/A-COM fabricates the MASWSS0024 using a 1.0-micron gate length MESFET process. The process features full chip passivation for performance and reliability.

Ordering Information[1]

Part Number	Package
MASWSS0024	Bulk Packaging
MASWSS0024TR	1000 piece reel
MASWSS0024TR-3000	3000 piece reel
MASWSS0024SMB	Sample Board

1. Reference Application Note M513 for reel size information.

Functional Block Diagram



Pin Configuration[2]

Pin	Function	Pin	Function
1	V1	5	RF2
2	V2	6	Ground
3	RF Common	7	Ground
4	Ground	8	RF1

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

Absolute Maximum Ratings [3,4]

Parameter	Absolute Maximum
Input Power (0.5 - 3.0 GHz) 3V Control 5V Control	 +30 dBm +33 dBm
Operating Voltage	+8.5 Volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

- **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.

Electrical Specifications [5]: T_A = 25°C, V_{CTL} = 0, 5.0V (unless otherwise specified)

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	0.01 - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB dB	— — — —	0.5 0.6 0.7 0.75	— 0.7 0.8 0.9
Isolation	0.01 - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB dB	— 51 48 43	59 54 52 48	— — — —
Return Loss	0.01 - 0.5 GHz [6] 0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 3.0 GHz	dB dB dB dB	— — — —	20 20 20 20	— — — —
Input IP_2	2-Tone 900 MHz, 5 MHz spacing (V_C = 5.0V)	dBm	—	83	—
Input IP_3	2-Tone 900 MHz, 5 MHz spacing (V_C = 5.0V)	dBm	—	43	—
Trise, Tfall	10% to 90% RF & 90% to 10% RF	nS	—	24	—
Ton, Toff	50% of V_C to 10% / 90% RF	nS	—	15	—
Transients	V_C = 5.0V square wave, in-band	mV	—	12	—

5. External DC blocking capacitors are required on all RF ports (47 pF capacitors are recommended). Use larger value capacitors for lower frequency operation (e.g. use 10,000 pF capacitors to optimize insertion and return loss at frequencies below 50 MHz).
6. Terminated return loss is governed by blocking capacitors internal to the device; see applications plot.

Truth Table

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

Logic Level	Voltage Level [7]
V_{LO} "0"	0 ± 0.2V
V_{HIGH} "1"	V_C ± 0.2V

7. 3.0V ≤ V_C ≤ 8.0V

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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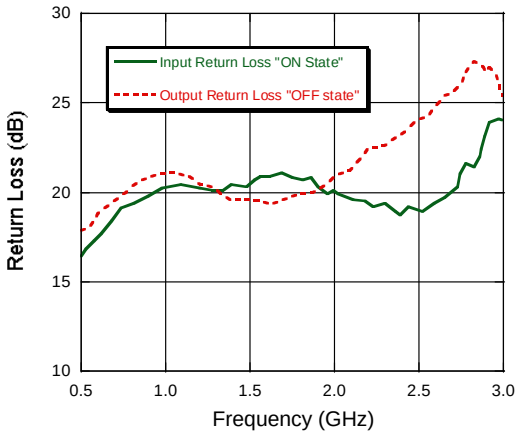
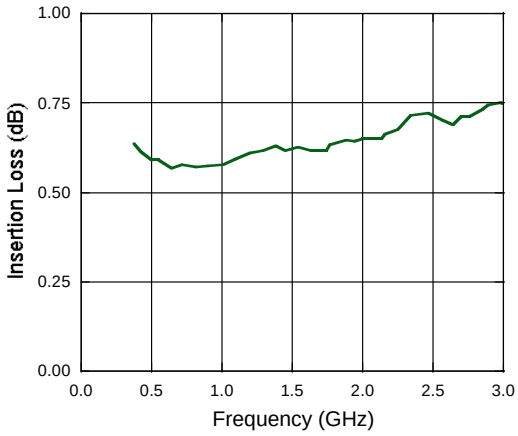
Typical Performance Curves

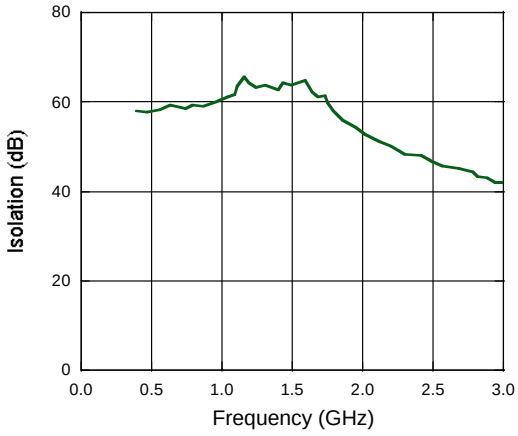
Return Loss vs. Frequency



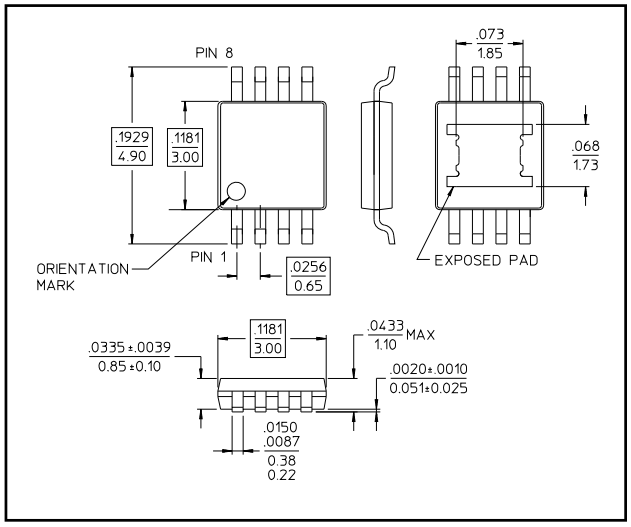
Insertion Loss vs. Frequency



Isolation vs. Frequency



MSOP-8-EP



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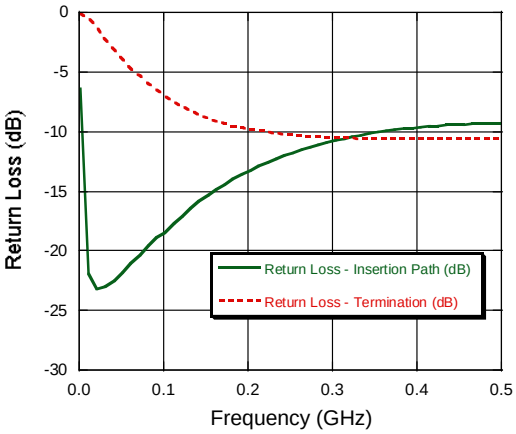
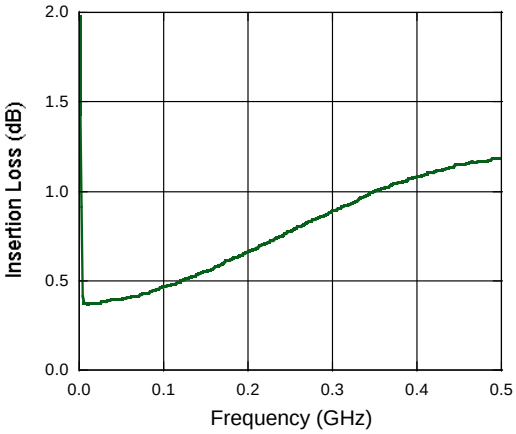
Applications Section

Typical Performance Curves, Very Low Frequency, 10000 pF Blocking Capacitors

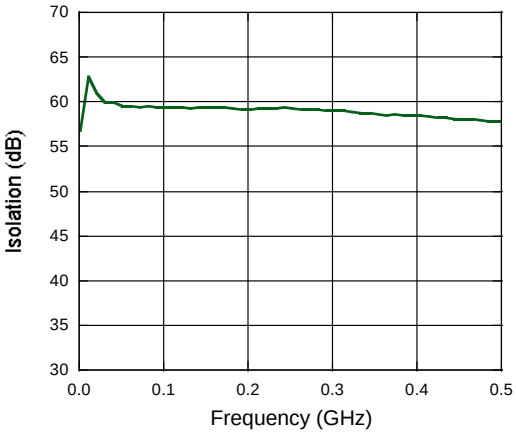
Return Loss vs. Frequency



Insertion Loss vs. Frequency



Isolation vs. Frequency



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