

GaAs SPDT Terminated Switch DC - 2.5 GHz

Features

- Very Low Power Consumption
- High Isolation: 30 dB up to 2 GHz
- Very High Intercept Point: 46 dBm IP₃
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Lead-Free SOIC-8 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of SW-338

Description

M/A-COM's MASWSS0180 is a GaAs MMIC SPDT terminated switch in a lead-free SOIC 8-lead surface mount plastic package. The MASWSS0180 is ideally suited for use where very low power consumption is required.

Typical applications include transmit/receive switching, switch matrices, and filter banks in systems such as radio and cellular equipment, PCM, GPS, fiber optic modules, and other battery powered radio equipment.

The MASWSS0180 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

Ordering Information

Part Number	Package
MASWSS0180	Bulk Packaging
MASWSS0180TR	1000 piece reel
MASWSS0180SMB	Sample Test Board

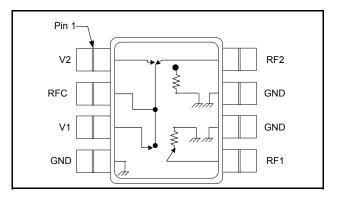
Note: Reference Application Note M513 for reel size information.

RoHS Compliant



MASWSS0180 V1

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function	
1	V2	5	RF Port 1	
2	RF Common	6	Ground	
3	V1	7	Ground	
4	Ground	8	RF Port 2	

Absolute Maximum Ratings ^{1,2}

Parameter	Absolute Maximum
Input Power 0.05 GHz 0.5 - 2.0 GHz	+27 dBm +34 dBm
Control Voltage	-8.5 V <u><</u> Vc <u><</u> + 5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.

 M/A-COM does not recommend sustained operation near these survivability limits.

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

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MASWSS0180

V1

Electrical Specifications: $T_A = 25^{\circ}C$, Vc = 0 V / -2.9 V, Z₀ = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ. ³	Max.
Insertion Loss	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB		0.55 0.60 0.65	 0.7
Isolation	DC - 0.5 GHz 0.5 - 1.0 GHz 1.0 - 2.0 GHz	dB dB dB		50 43 35	
VSWR On/Off	DC - 2.0 GHz	Ratio	_	1.1:1	—
Trise, Tfall	10% to 90% RF, 90% to 10 % RF	nS	—	10	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	nS	—	20	_
Transients	In-Band	mV		25	_
1 dB Compression Point	Input Power 0.05 GHz 0.5 - 2.0 GHz	dBm dBm	_	25 30	
2nd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm) 0.05 GHz 0.5 - 2.0 GHz	dBm dBm	_	60 65	_
3rd Order Intercept	Measured Relative to Input Power (for two-tone input power up to +5 dBm) 0.05 GHz 0.5 - 2.0 GHz	dBm dBm	_	40 46	
Control Current	Vc = 2.9 V	μA	—	15	35

3. Typical values represent performance at middle of frequency range noted.

Truth Table ⁴

2

Control Inputs		Condition of Switch RF Common to Each RF Por	
V1	V2	RFC-RF1	RFC-RF2
1	0	ON	OFF
0	1	OFF	ON

4. 0 = 0 V \pm 0.2 V, 1 = -2.9 V to -5.0 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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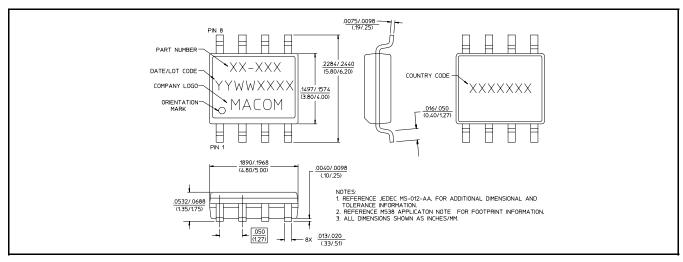




MASWSS0180

V1

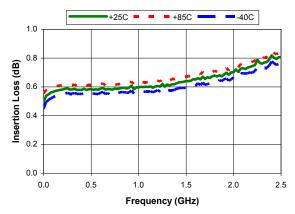
Lead-Free SOIC-8⁺



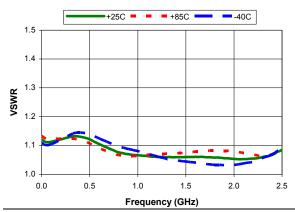
[†] Reference Application Note M538 for lead-free solder reflow recommendations.

Typical Performance Curves

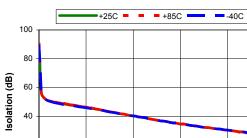
Insertion Loss



VSWR vs. Frequency



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1.0

Frequency (GHz)

1.5

2.0

2.5

0.5

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Isolation

20

0

0.0