MASW-007588

GaAs Broadband SPDT Switch
DC - 6.0 GHz

Rev. V1

Features

- UNII, Hiperlan, and 802.11a+b/g Applications
- Broadband Performance: DC-6 GHz
- Low Insertion Loss: 0.9 dB at 6 GHz
- High Isolation: 28 dB Typical
- Fast Switching Speed: 0.5 µm GaAs PHEMT
- High Power: 36 dBm P1dB
- Fast Settling for Low Gate Lag Requirements
- Lead-Free 3 mm 12-lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MASW-007588 is a broadband GaAs PHEMT MMIC SPDT switch in a low cost, lead-free 3 mm 12-lead PQFN package. The MASW-007588 is ideally suited for applications where very small size and low cost are required.

The MASW-007588, with its small size and low height, is ideal for 802.11a and 802.11b/g PC card and access point applications.

The MASW-007588 delivers high isolation, low insertion loss and high linearity up to 6 GHz.

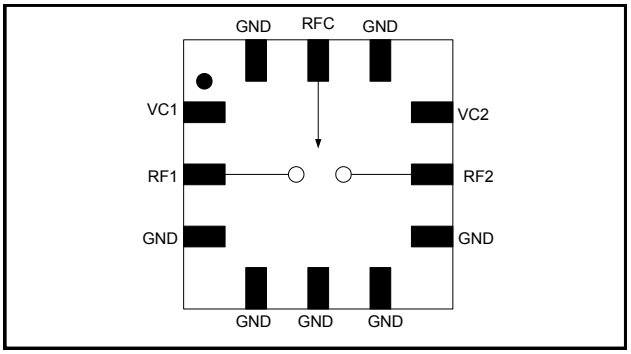
The MASW-007588 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information[1]

Part Number	Package
MASW-007588-TR3000	3000 piece reel
MASW-007588-000SMB	Sample Test Board (Includes 5 Samples)

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

PIN No.	PIN Name	Description
1	VC1	Control 1
2	RF1	RF Port 1
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	RF2	RF Port 2
9	VC2	Control 2
10	GND	Ground
11	RFC	RF Input
12	GND	Ground
13	Paddle [2]	RF and DC Ground

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 @ 3 V Control	+37 dBm
Input Power @ 5 V Control	+39 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.

* Restrictions on Hazardous Substances, European Union Directive 002/95/EC.

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Electrical Specifications[5]: T_A = 25°C, Z_0 = 50Ω, Vc = 0 V/3 V, Pin = 0 dBm

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	2.4 GHz 5.3 GHz 5.8 GHz	dB dB dB	— — —	0.70 0.85 0.85	1.05 1.2 1.2
Isolation	2.4 GHz 5.3 GHz 5.8 GHz	dB dB dB	24 23 21	29 28 26	— — —
Return Loss	DC - 6 GHz	dB	—	20	—
IP2	Two Tone, +15 dBm/Tone, 5 MHz Spacing, >50 MHz 2.4 GHz, Vc = 3.0 V 5.8 GHz, Vc = 3.0 V 2.4 GHz, Vc = 5.0 V 5.8 GHz, Vc = 5.0 V	 dBm dBm dBm dBm	 — — — —	 98 81 107 87	 — — — —
IIP3	Two Tone, +15 dBm/Tone, 5 MHz Spacing, >50 MHz 2.4 GHz, Vc = 3.0 V 5.8 GHz, Vc = 3.0 V 2.4 GHz, Vc = 5.0 V 5.8 GHz, Vc = 5.0 V	 dBm dBm dBm dBm	 — — — —	 57 53 57 54	 — — — —
Input P-1dB	2.4 GHz 5.3 GHz 5.8 GHz	dBm dBm dBm	— — —	40 36 37	— — —
2nd Harmonic	2.4 GHz, Pin = +20 dBm 5.8 GHz, Pin = +20 dBm	dBm dBm	— —	-72 -69	— —
3rd Harmonic	2.4 GHz, Pin = +20 dBm 5.8 GHz, Pin = +20 dBm	dBm dBm	— —	-85 -75	— —
T-rise, T-fall	10% to 90% RF and 90% to 10% RF	nS	—	55	—
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	nS	—	80	—
Transients	—	mV	—	14	—
Control Current	|Vc| = 3 V	µA	—	15	25

Truth Table [5,6,7]

Control V1	Control V2	RFC– RF1	RFC—RF2
1	0	On	Off
0	1	Off	On

5. For positive voltage control, external DC blocking capacitors are required on all RF ports.
6. Differential voltage, V(state 1) - V(state 0), must be +2.7 V minimum and must not exceed +5 V.
7. 0 = 0 ± 0.2 V, 1 = +2.9 V to +5 V.

Handling Procedures

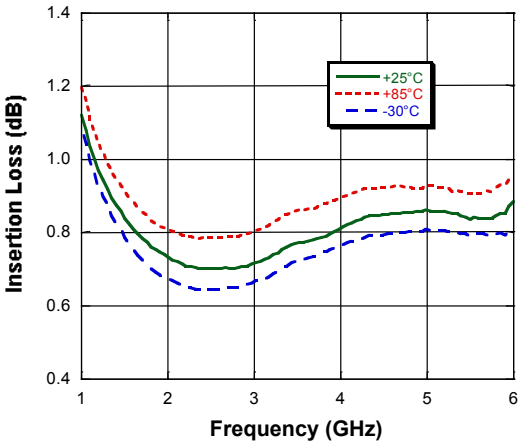
Please observe the following precautions to avoid damage:

Static Sensitivity

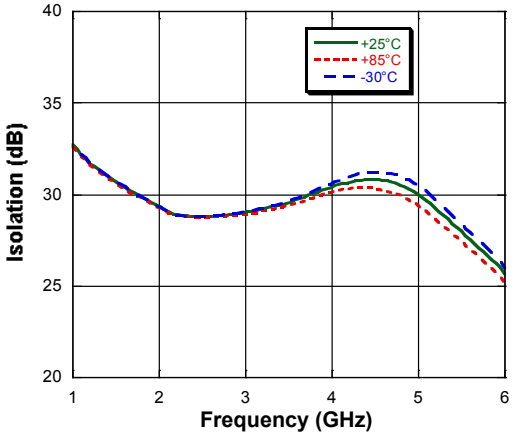
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Typical Performance Curves

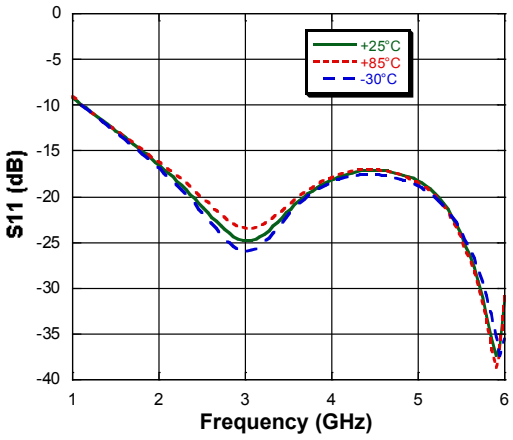
Insertion Loss



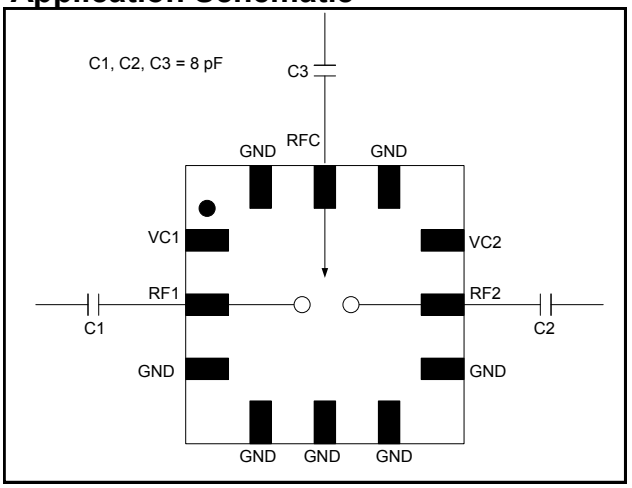
Isolation



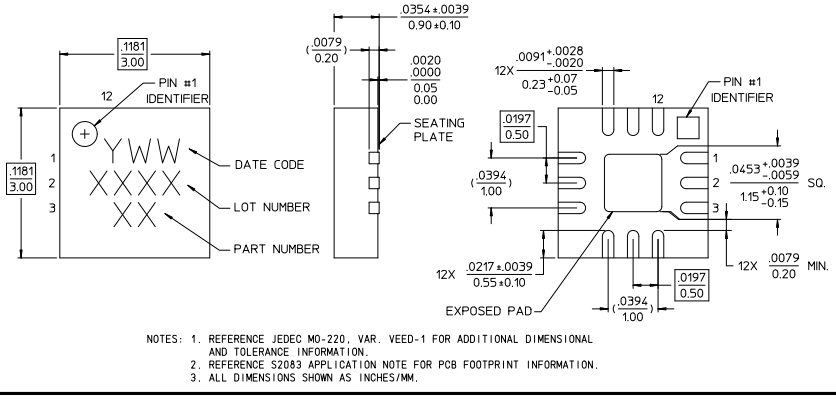
Return Loss



Application Schematic



Lead-Free 3 mm 12-lead PQFN†



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