

Features

- 802.11b/g and Bluetooth Applications
- Insertion Loss: 0.60 dB typical
- Isolation:
 - 31.5 dB typical (R_x Path)
 - 22.0 dB typical (T_x / BT paths)
- Flip-chip configuration
- RoHS* Compliant

Description

M/A-COM's MASW-008902-000DIE is a bumped single band GaAs pHEMT MMIC SP3T switch. Typical applications are for single band 2.4 GHz WLAN (802.11 b/g) and Bluetooth applications.

The MASW-008902-000DIE delivers high isolation, low insertion loss, and high linearity at 2.4 - 2.5 GHz.

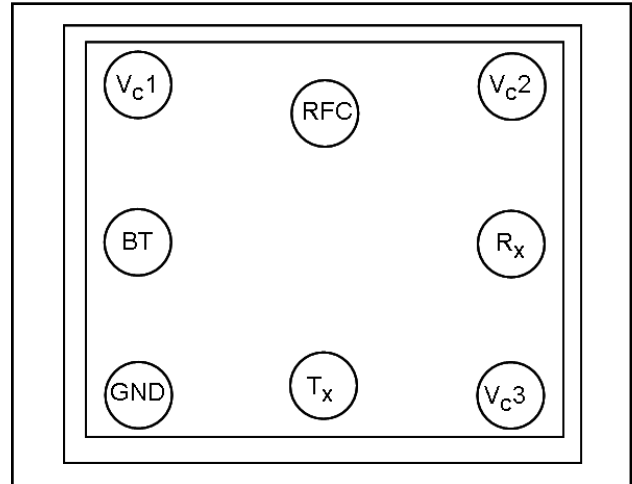
The MASW-008902-000DIE is fabricated using a 0.5 micron gate length GaAs pHEMT process. The process features full passivation for performance and reliability. This die features SnAg (2.5 %) solder bump for flip-chip on lead frame package or WLCSP.

Ordering Information ¹

Part Number	Package
MASW-008902-000DIE	Separated Die on Grip Ring
MASW-008902-000D3K	Die on 3000 piece reel

1. Die quantity varies.

Die Bumping Pad Layout (bump side up)



Die Bumping Pad Configuration

Name	Description
V _{c1}	Voltage Control 1
BT	Blue Tooth T _x /R _x Port
GND	Ground
T _x	2.5 GHz T _x Port
V _{c3}	Voltage Control 3
R _x	2.5 GHz R _x Port
V _{c2}	Voltage Control 2
RFC	Antenna Port

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

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- **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.macom.com for additional data sheets and product information.

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Electrical Specifications²: $T_A = 25^\circ\text{C}$, $Z_0 = 50 \Omega$, $V_C = 0/3\text{V}$, $P_{IN} = 0 \text{ dBm}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	RFC to T _X /R _X /BT, 2.4 GHz	dB	—	0.60	0.75
Isolation	RFC to T _X , 2.4 GHz	dB	20	22.0	—
	RFC to R _X , 2.4 GHz	dB	30	31.5	—
	RFC to BT, 2.4 GHz	dB	20	22.0	—
Return Loss	2.4 - 2.5 GHz	dB	—	15	—
IP3	RF to T _X /R _X /BT, 2.4 GHz, 20 dBm Total Power, 1 MHz Spacing	dBm	—	55	—
Input P1dB	RF to T _X , 2.4 - 2.5 GHz	dBm	—	32	—
	RF to R _X , 2.4 - 2.5 GHz	dBm	—	28	—
	RF to BT, 2.4 - 2.5 GHz	dBm	—	32	—
Harmonics	RF to T _X , 2.4 - 2.5 GHz, 20 dBm	dBm	—	-75	—
Control Current	$ V_C = 3 \text{ V}$	μA	—	<1	2

2. External blocking capacitors on all RF ports.

Absolute Maximum Ratings^{3,4}

Parameter	Absolute Maximum
Input Power @ 3 V Control	+32 dBm
Input Power @ 5 V Control	+35 dBm
Operating Voltage	+8 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

- 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.

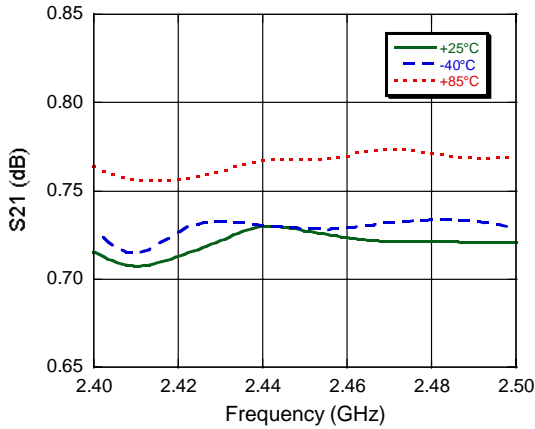
Truth Table^{5,6,7}

Control V1	Control V2	Control V3	RFC-BT	RFC-T _X	RF-R _X
1	0	0	On	Off	Off
0	1	0	Off	On	Off
0	0	1	Off	Off	On

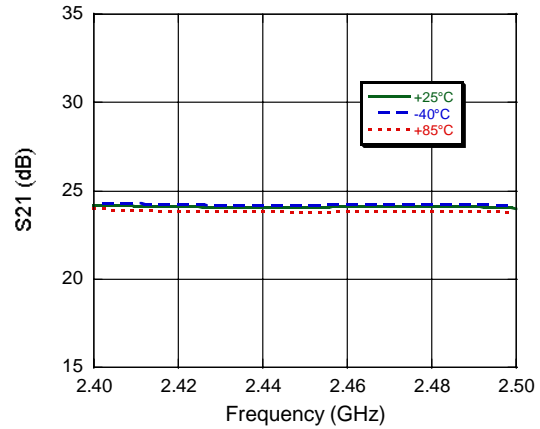
- For positive voltage control, external DC blocking capacitors are required on all RF ports.
- Differential voltage, $V(\text{state } 1) - V(\text{state } 0)$, must be +2.7 V minimum and must not exceed +5 V.
- $0 = 0 \pm 0.3 \text{ V}$, $1 = +2.7 \text{ V to } +5 \text{ V}$.

Typical Performance Curves (plots = chip on board assembly)

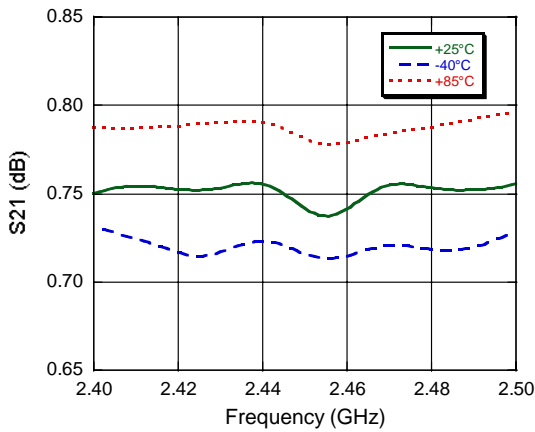
T_x Insertion Loss



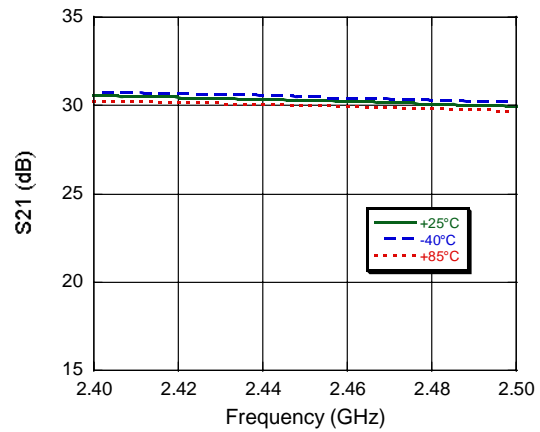
T_x Isolation



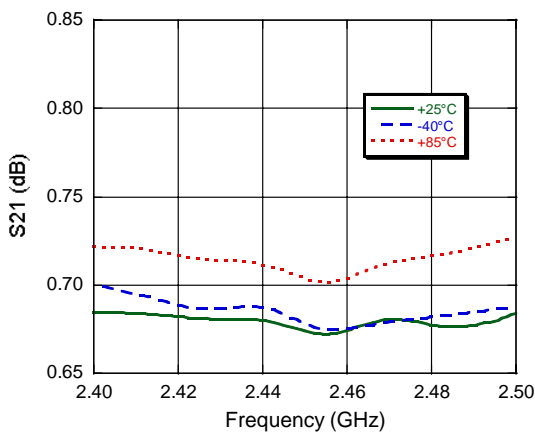
R_x Insertion Loss



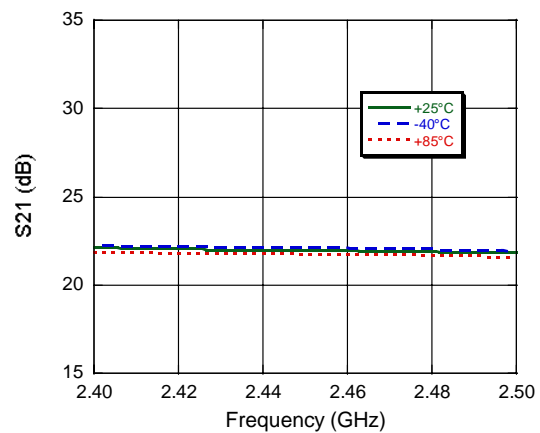
R_x Isolation



BT Insertion Loss



BT Isolation



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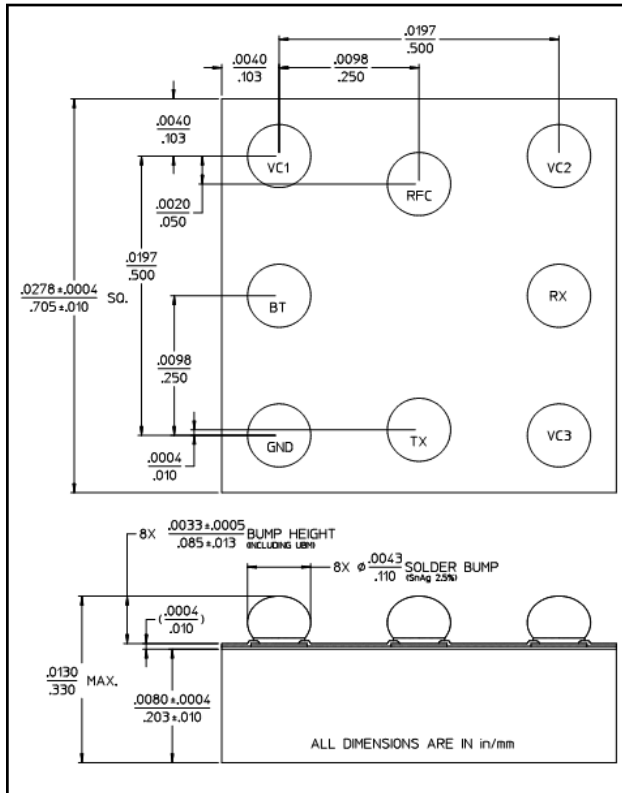
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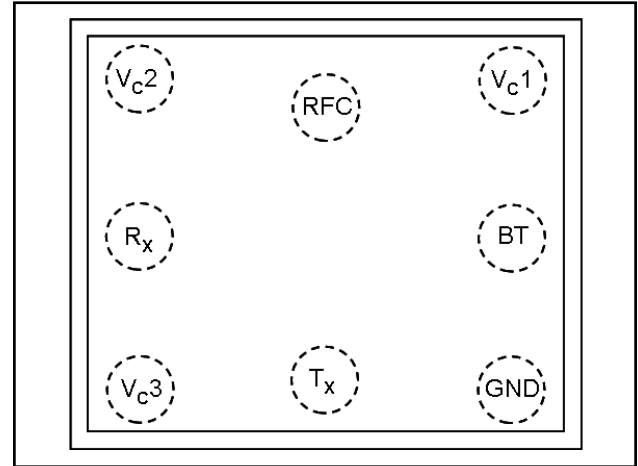
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Die Dimensions and Side View



Looking through die at bumps (as installed on board, bump side down)



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.