MASW-008206-000DIE

Tyco Electronics

GaAs WLAN - WiMax Dual SPDT Switch
2.4 - 5.8 GHz WLAN

M/A-COM Products
Rev. V1

Features

- 802.11a & b/g, UNII, and Hiperlan Applications
- Optimized for 2.4 - 5.8 GHz WLAN
- Low Insertion Loss:
- 0.7 dB @ 2.4 GHz
- 0.9 dB @ 5.0 GHz
- High Isolation: 28 dB Typical
- Low Harmonics: <-63 dBc @ 20 dBm
- RoHS* Compliant

Description

M/A-COM's MASW-008206-000DIE is a WLAN / WiMax GaAs PHEMT MMIC Dual SPDT switch. One SPDT (RF2) is optimized for 2.4 GHz WLAN / WiMax. The other (RF5) is optimized for 5.8 GHz WLAN and WiMax applications. Typical applications are for 802.11a and 802.11b/g PC card and access point applications.

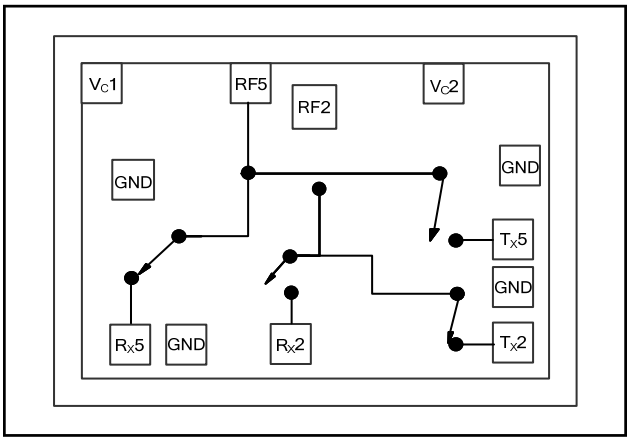
The MASW-008206-000DIE delivers high isolation, low insertion loss and high linearity up to 5.8 GHz. The MASW-008206-000DIE is fabricated using a 0.5 micron gate length GaAs pHEMT process. The process features full passivation for performance and reliability.

Ordering Information [1]

Part Number	Package
MASW-008206-000DIE	Separated Die on Grip Ring

1. Die quantity varies.

Die Bond Pad Layout



Die Bond Pad Configuration

Pad No.	Name	Description
1	V_C1	Voltage Control 1
2	GND	Ground
3	R_X5	5 GHz R_X Port
4	GND	Ground
5	R_X2	2.4 GHz R_X Port
6	T_X2	2.4 GHz T_X Port
7	GND	Ground
8	T_X5	5 GHz T_X Port
9	GND	Ground
10	V_C2	Voltage Control 2
11	RF2	2.4 GHz Antenna Port
12	RF5	5 GHz Antenna Port

Absolute Maximum Ratings [2,3]

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

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

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

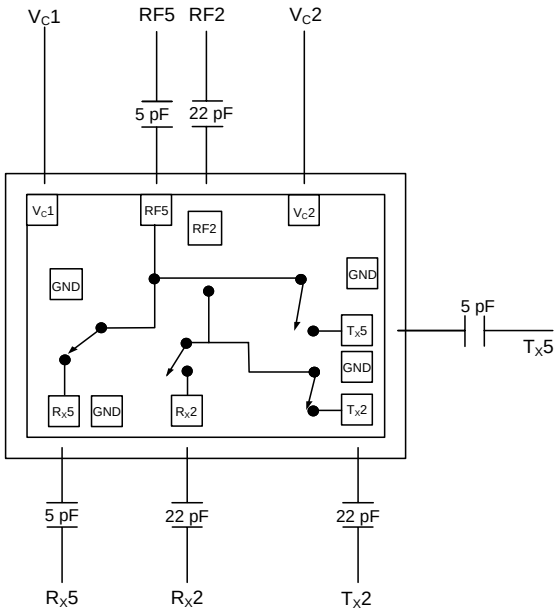
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
Visit www.macom.com for additional data sheets and product information.

Electrical Specifications[4,5]: T_A = 25°C, Z_0 = 50Ω, Vc = 0V / 3V, Pin = 0 dBm

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	RF2 to Tx2/R_X2, 2.4 GHz RF5 to Tx5/Rx5, 5.0 GHz	dB dB	— —	0.7 0.9	1.0 1.2
Isolation	RF2 to Tx2/R_X2, 2.4 GHz RF5 to Tx5/Rx5, 5.0 GHz	dB dB	25.5 21.0	30.0 25.0	— —
Return Loss	DC - 6 GHz	dB	—	15	—
IP3	RF2 to Tx2/Rx2, 2.4 GHz, 20dBm Total Power, 1MHz Spacing RF5 to Tx5/Rx5, 4.9 GHz, 20dBm Total Power, 1MHz Spacing	dBm dBm	— —	54 55	— —
Input P1dB	RF2 to Tx2, 2.4-2.5 GHz RF5 to Tx5, 4.9-5.9 GHz	dBm dBm	— —	28 28	— —
Harmonics	RF2 to Tx2, 2.4-2.5 GHz, 20 dBm RF5 to Tx5, 4.9-5.9 GHz, 20 dBm	dBm dBm	— —	-63 -67	— —
Control Current	|Vc| = 3 V	µA	—	<1	10.0
T_{RISE} / T_{FALL}	10% - 90% RF, 90% - 10% RF	nS	—	22	—
T_{ON} / T_{OFF}	50% Control - 90% RF, 50% Control - 10% RF	nS	—	30	—

4. External blocking capacitors on all RF ports.
5. Electrical min/max are guaranteed in die form only.

Application Schematic



RF2 to T_X2 and RF2 to R_X2 paths are optimized for 2.4-2.5 GHz WLAN / WiMax applications

RF5 to T_X5 and RF5 to R_X5 paths are optimized for 4.8-6 GHz WLAN / WiMax applications

Truth Table [6,7,8]

Control V_C1	Control V_C2	RF2 - T_X2 RF5 - R_X5	RF2 - R_X2 RF5 - T_X5
1	0	On	Off
0	1	Off	On

6. For positive voltage control, external DC blocking capacitors are required on all RF ports.
7. Differential voltage, V(state 1) - V(state 0), must be +2.7 V minimum and must not exceed +5 V.
8. 0 = 0 ± 0.3 V, 1 = +2.7 V to +5 V.

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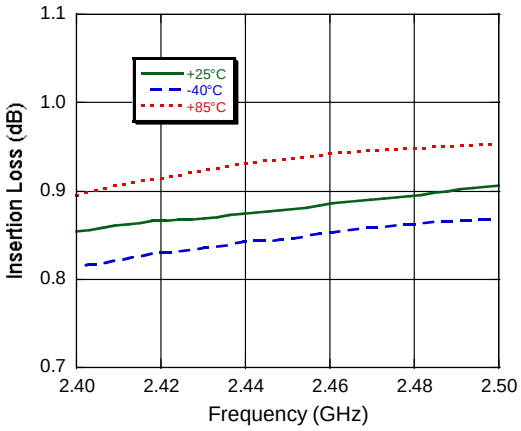
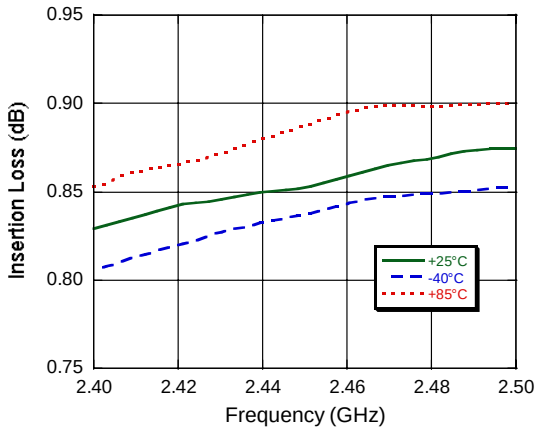
Typical Performance Curves @ 2.4 GHz (plots = chip on board assembly)

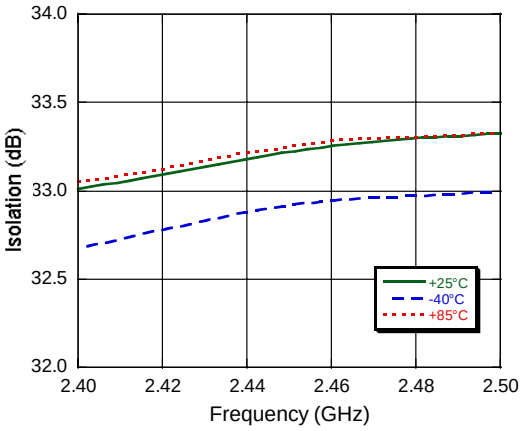
T_X Insertion Loss



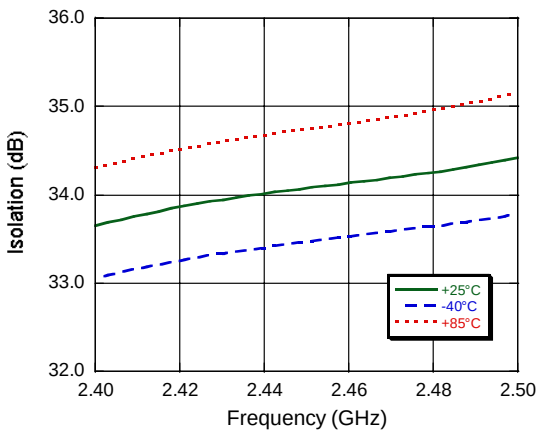
R_X Insertion Loss



T_X Isolation



R_X Isolation



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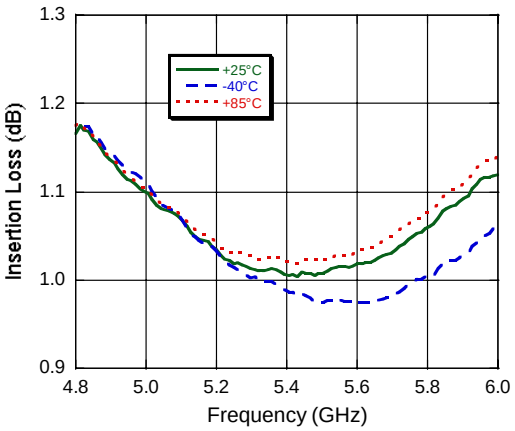
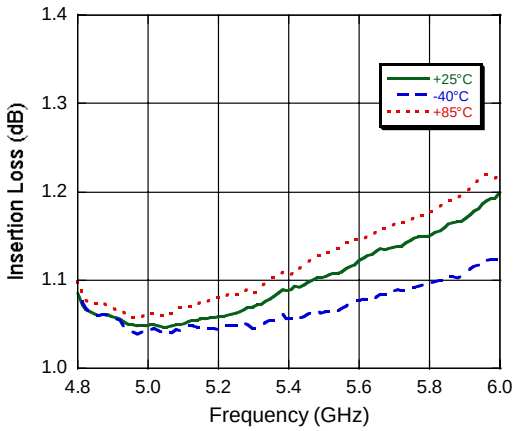
Typical Performance Curves @ 5.0 GHz (plots = chip on board assembly)

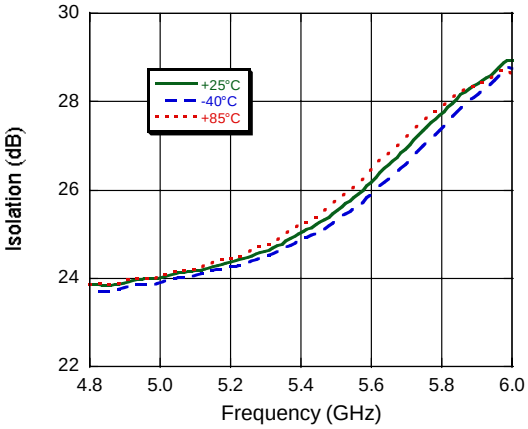
T_X Insertion Loss



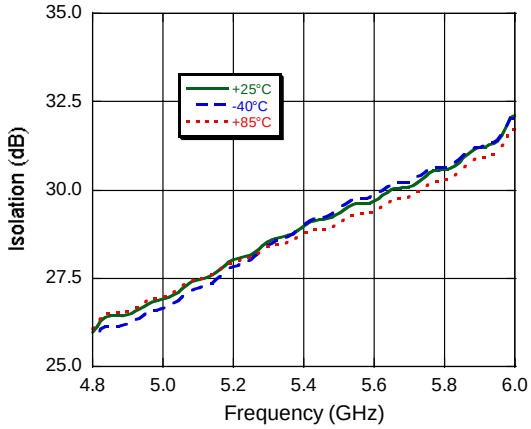
R_X Insertion Loss



T_X Isolation



R_X Isolation



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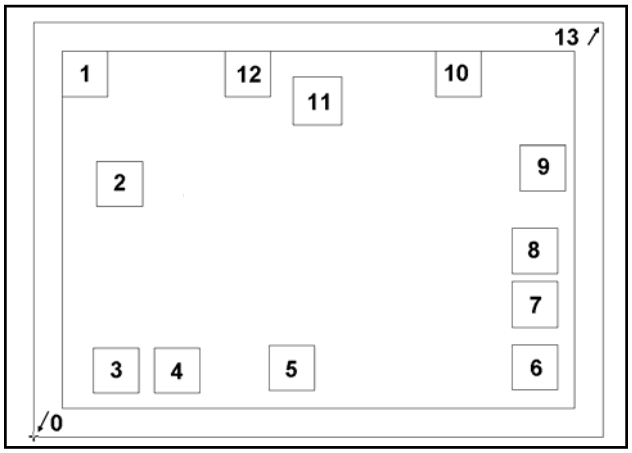
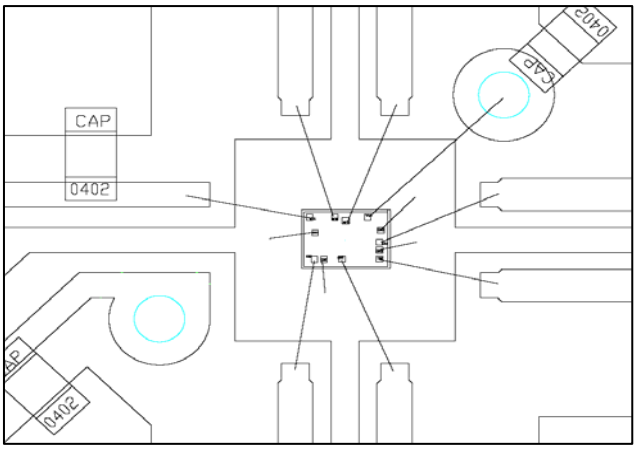
Outline Drawing



Chip mounted to PWB for testing purposes



Pad Configuration [8]

Die Size: 890 x 650 µm (nominal)

Pad No.	X (µm) nominal	Y (µm) nominal	Pad Size (µm)
0	0	0	Lower left edge of die
1	80.5	569.5	71 x 71
2	134.5	397	71 x 71
3	129	104	71 x 71
4	224	104	71 x 71
5	403.75	108	71 x 71
6	783.5	109	71 x 71
7	783.5	208	71 x 71
8	783.5	292	71 x 71
9	795.25	421.75	71 x 71
10	664	569.5	71 x 71
11	443	527	76 x 76
12	334.75	569.5	71 x 71
13	890	650	Upper right edge of die

8. All X,Y dimensions are at bond pad center.

Qualification

Qualified to M/A-COM specification REL-201, Process Flow –2.

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 MASW-008206-000DIE, which are Class Zero (100 V) devices.

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