

**SPDT T/R Switch**  
**5.0 - 6.0 GHz**

**MA0S506AJ**  
**V2**

**Features**

- Ideal for 802.11a Hiperlan Applications
- Positive Control Voltages
- +32 dB One dB Compression Point
- Fast Switching Speed
- No External Components Required
- MSOP-8 Package

**Description**

The MA0S506AJ is a medium power 5.0-6.0 SPDT switch. Typical Applications include the transmit/receive functions in 802.11a and Hiperlan, and fixed wireless access applications. All RF impedances are 50 Ω, and all RF ports are internally DC blocked. The switch operates over a typical voltage range of 2.7 to 5.5 volts. The MA0S506AJ is offered in a MSOP-8 package.

The MA0S506AJ is fabricated using M/A-COM's 0.5 micron MESFET process for a low single supply voltage, high linearity, and excellent reliability.

**Ordering Information <sup>1</sup>**

Part Number	Package
MA0S506AJ-R7	7 inch, 1000 piece reel
MA0S506AJ-R13	13 inch, 3000 piece reel
MA0S506AJ-SMB	Sample Test Board

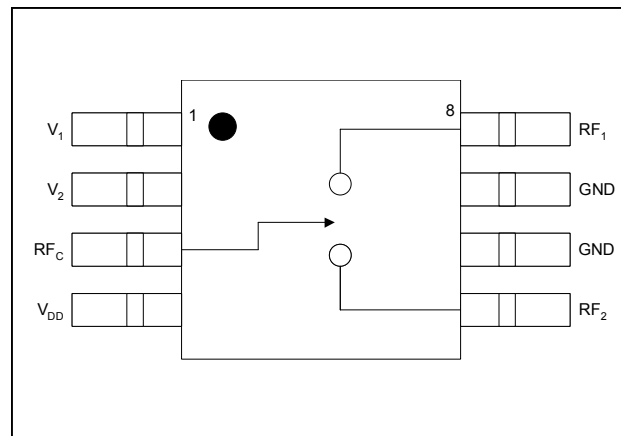
1. Reference Application Note M513 for reel size information.

**Absolute Maximum Ratings <sup>2,3</sup>**

Parameter	Absolute Maximum
Max Input Power	+33 dBm
Control Voltages	+8.0 volts
Supply Voltages	+8.0 volts
Operating Temperature	-40°C to +100°C
Channel Temperature	+150°C
Storage Temperature	-40°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.

**Functional Schematic**



**Pin Configuration**

Pin No.	Pin Name	Description
1	V <sub>1</sub>	Control Voltage 1
2	V <sub>2</sub>	Control Voltage 2
3	RF <sub>C</sub>	RF Common Port
4	V <sub>DD</sub>	Supply Voltage
5	RF <sub>2</sub>	RF Port 2
6	GND	Ground
7	GND	Ground
8	RF <sub>1</sub>	RF Port 1

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**Electrical Specifications:  $T_A = 25^\circ\text{C}$ ,  $Z_0 = 50 \Omega^4$**

Parameter	Test Conditions	Unit	Min.	Typ.	Max.
Insertion Loss		dB	—	1.4	1.8
Isolation		dB	25	28	—
Return Loss		dB	—	9	—
$T_{RISE}$ , $T_{FALL}$ $T_{ON}$ , $T_{OFF}$	10% to 90% RF, 90% to 10% RF 50% Control to 90% RF, 50% Control to 10% RF	nS nS	— —	10 25	— —
1 dB Compression	$V_1/V_2 = 0/3 \text{ V}$ , $V_{DD} = 3 \text{ V}$ $V_1/V_2 = 0/5 \text{ V}$ , $V_{DD} = 5 \text{ V}$	dBm dBm	— —	32 35	— —
Third Order Intercept		dBm	—	44	—

4. Unless otherwise specified, input power is -10 dBm,  $V_{DD}$  is +5 V, control voltages are 0/+5 V, and test frequency is 5.775 GHz

**Switch Logic Table <sup>5,6</sup>**

Insertion Loss Path	Isolated Path	$V_1$	$V_2$
RF <sub>1</sub> /RF <sub>C</sub>	RF <sub>2</sub> /RF <sub>C</sub>	1	0
RF <sub>2</sub> /RF <sub>C</sub>	RF <sub>1</sub> /RF <sub>C</sub>	0	1

5. "0" = 0 +/- 0.2 volts

6. "1" = +2.7 to +5 volts, equal to  $V_{DD}$

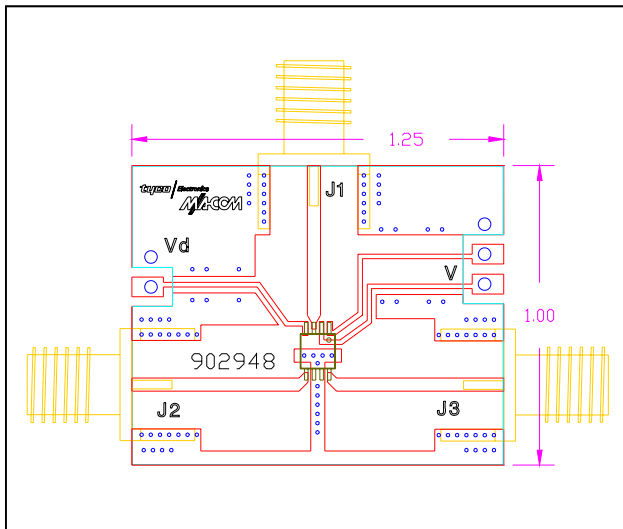
**Handling Procedures**

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.

**Application Schematic**



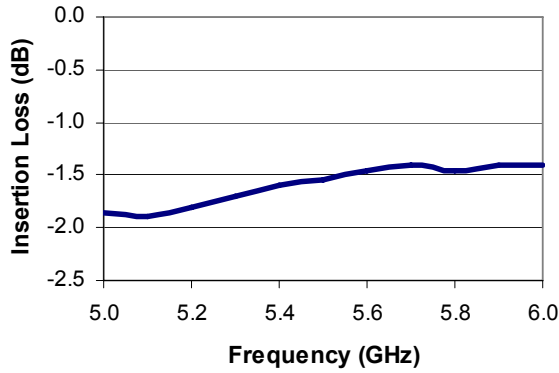
Board material: Rogers Duroid RO4350, 20 mil thick dielectric ( $\epsilon_r=3.48$ ). All RF traces are 50 ohms (43mils wide).

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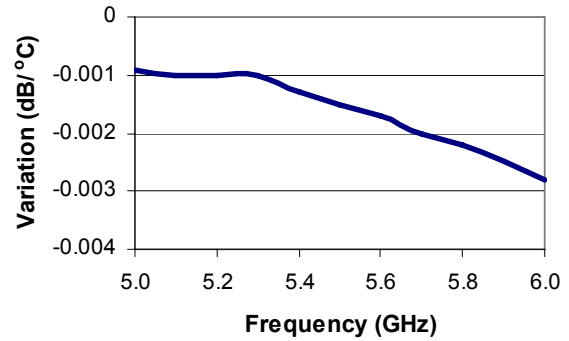
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**Typical Performance**

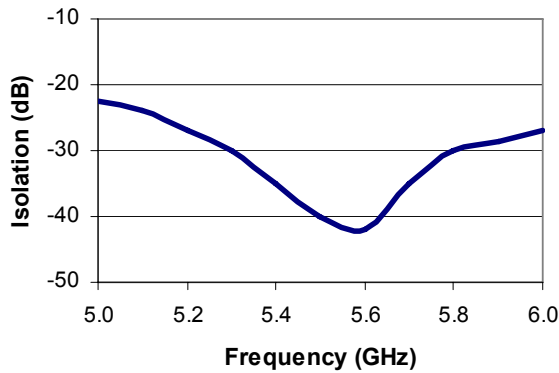
**Insertion Loss vs. Frequency**



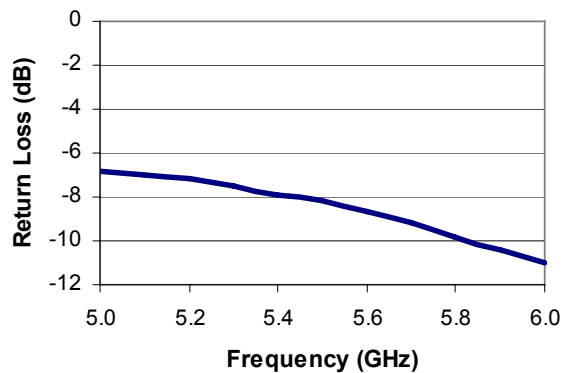
**Insertion Loss Variation vs. Frequency**



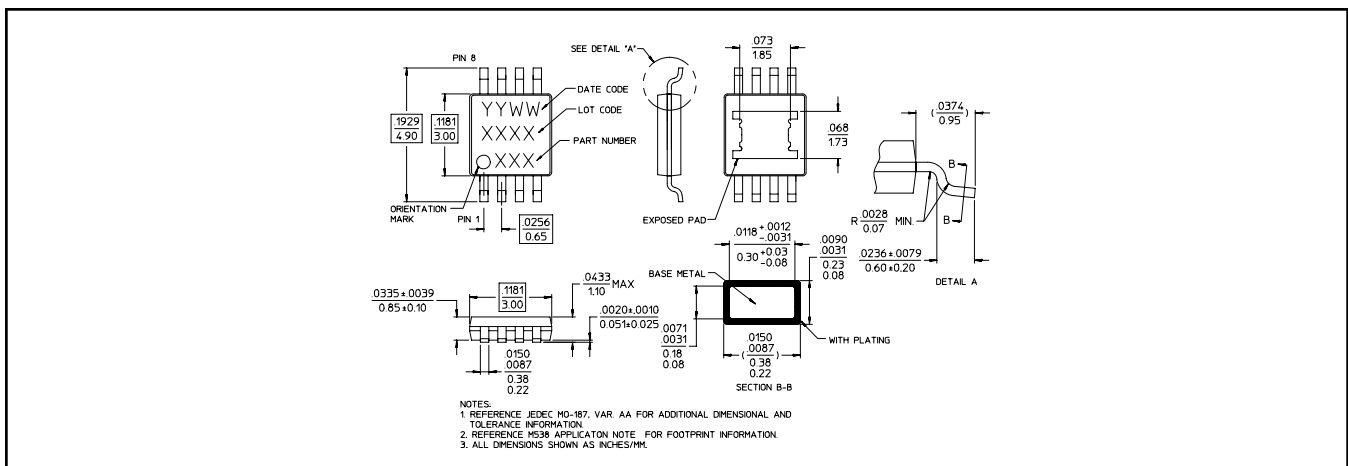
**Isolation vs. Frequency**



**Return Loss vs. Frequency**



**MSOP-8 Package†**



†Meets JEDEC moisture sensitivity level 1 requirements.