

**GaAs SP6T Switch, Absorptive, Single Supply
DC - 3.0 GHz**

**MASWCC0009
V3**

Features

- Typical Isolation: 35 dB (2.0 GHz)
- Typical Insertion Loss: 1.2 dB (2.0 GHz)
- Integral ASIC/CMOS Driver
- 50 Ohm Nominal Impedance
- Low DC Power Consumption
- Test Boards Available
- Lead-Free QSOP-24 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of SW65-0440

Description

M/A-COM's MASWCC0009 is a GaAs MMIC absorptive SP4T switch with an integral silicon ASIC driver. This device is in a 24-lead plastic package. This switch offers excellent broadband performance and repeatability from DC to 3 GHz, while maintaining low DC power dissipation. The MASWCC0009 is ideally suited for wireless infrastructure applications.

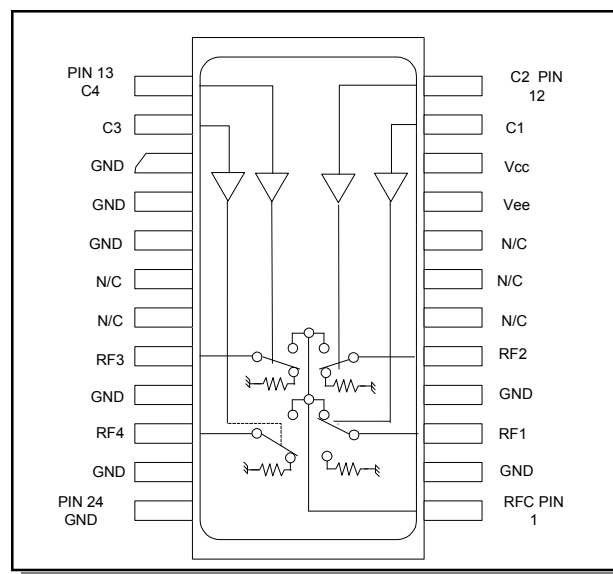
Ordering Information

Part Number	Package
MASWCC0009	Bulk Packaging
MASWCC0009-TR	1000 piece reel
MASWCC0009-TB	Sample Test Board

Note: Reference Application Note M513 for reel size information.

Note: Die quantity varies.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	RFC	13	C4
2	GND	14	C3
3	RF1	15	GND
4	GND	16	GND
5	RF2	17	GND
6	N/C	18	N/C
7	N/C	19	N/C
8	N/C	20	RF3
9	V _{EE}	21	GND
10	V _{CC}	22	RF4
11	C1	23	GND
12	C2	24	GND

N/C = No Connection

The exposed pad centered on the package bottom must be connected to RF and DC ground. (For MLF Packages)

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

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Electrical Specifications: $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss	DC - 2.0 GHz DC - 3.0 GHz	dB dB	— —	1.2 1.3	1.8 2.5
Isolation (All arms off)	DC - 2.0 GHz DC - 3.0 GHz	dB dB	32 25	35 29	— —
VSWR	RF1-RF4 On RF1- RF4 Off RFC RFC	Ratio Ratio Ratio Ratio	— — — —	1.2:1 1.4:1 1.2:1 1.6:1	1.6:1 1.8:1 1.5:1 2.2:1
Switching Speed ¹ T_{rise} T_{fall} T_{on} T_{off} Transients	10%/90%, 90%/10% 50% TTL to 90%/10% RF In-band (peak to peak)	nS nS mV	- - -	15 50 50	50 150 150
1 dB Compression	.05 GHz .5 - 3.0 GHz	dBm dBm	- -	+20 +27	- -
Input IP_3	Two tone inputs 0.05 GHz up to +5 dBm 0.5 - 3.0 GHz	dBm dBm	- -	+35 +46	- -
V_{CC}	-	V	+4.5	+5.0	+5.5
V_{EE}	-	V	-8.0	-5.0	-4.75
I_{CC}	$V_{CC} = +5.0\text{V}$	mA	-	-	4
I_{EE}	$V_{EE} = -5.0\text{V}$	mA	-	-	-1
Logic "0"	$I_{in} = 20\mu\text{A max}$	V	0.0	-	0.8
Logic "1"	$I_{in} = 20\mu\text{A max}$	V	2.0	-	5.0

1. Decoupling capacitors (.1 μF) are required on the power supply lines.

Absolute Maximum Ratings ^{2,3,4}

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 3.0 GHz	+27 dBm +34 dBm
Bias Voltages V_{EE} V_{CC} Control Voltage ⁵	-8.5V +5.5V -0.5V to V_{CC} +0.5V
Storage Temperature	-65°C to +125°C
Operating Temperature	-40°C to +85°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.
- When the RF input is applied to the terminated port, the absolute maximum power is +30 dBm.
- Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

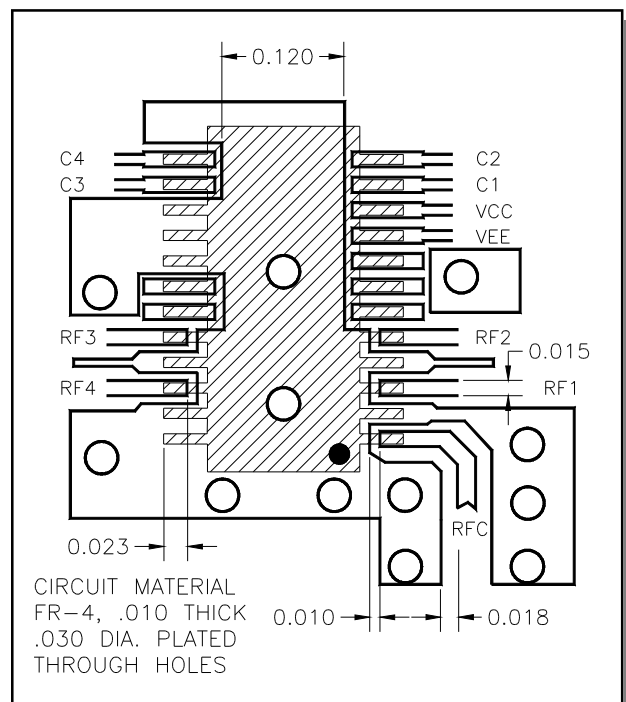
Truth Table (Switch)

TTL				RF Common To:			
C1	C2	C3	C4	RF1	RF2	RF3	RF4
1	0	0	0	On	Off	Off	Off
0	1	0	0	Off	On	Off	Off
0	0	1	0	Off	Off	On	Off
0	0	0	1	Off	Off	Off	On

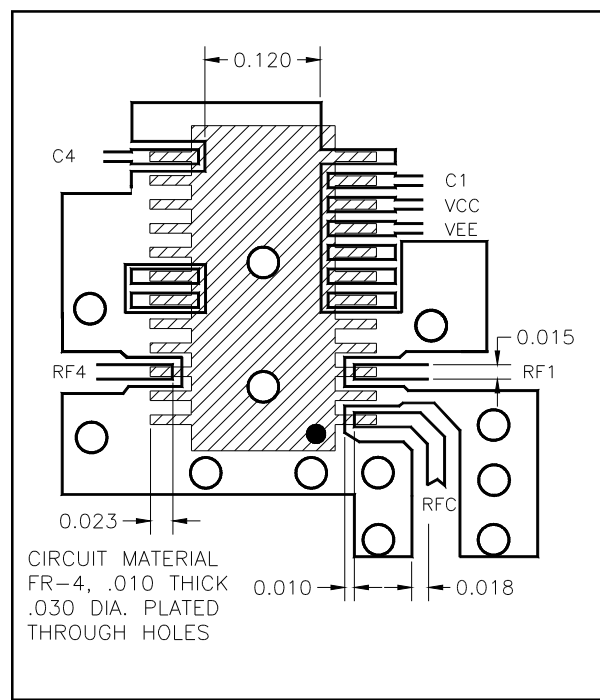
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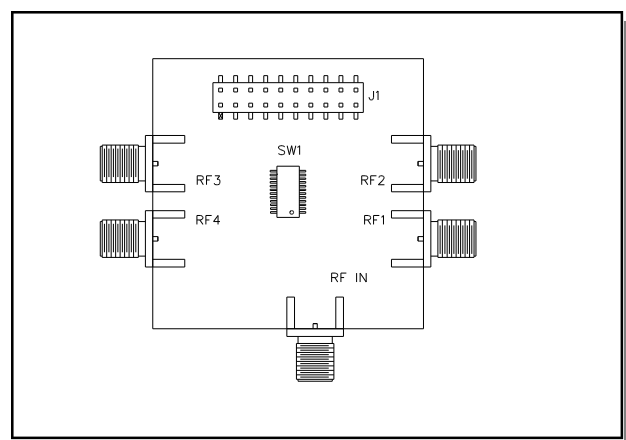
Recommended PCB Layout—SP4T



Recommended PCB Layout—SP2T



Evaluation Board - SW65-0440-TB



Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

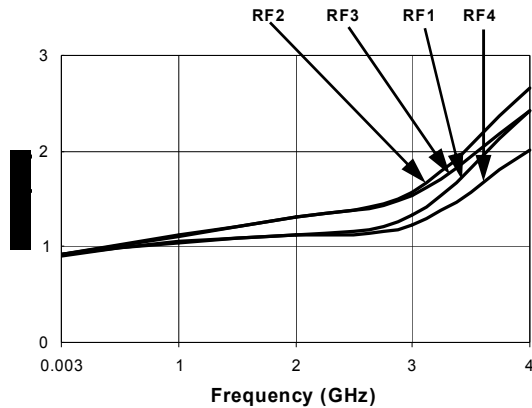
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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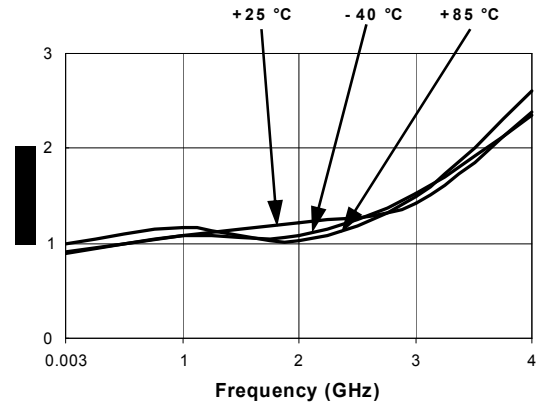
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Typical Performance Curves

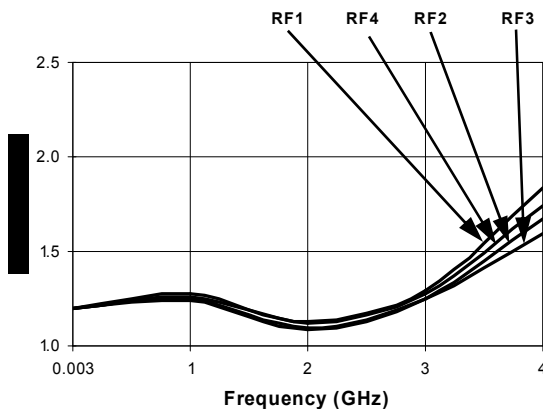
Insertion Loss (dB) @ +25°C



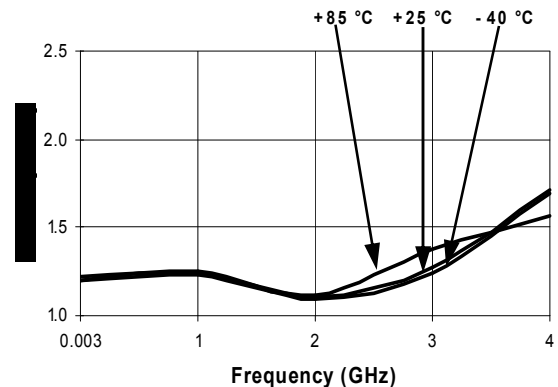
Loss Variation Over Temp. (dB)



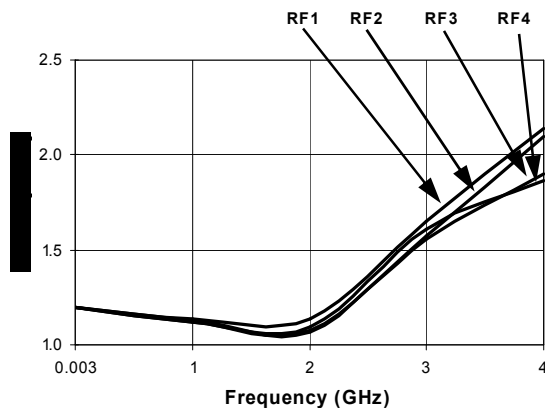
RF1 - RF4 On VSWR @ +25°C



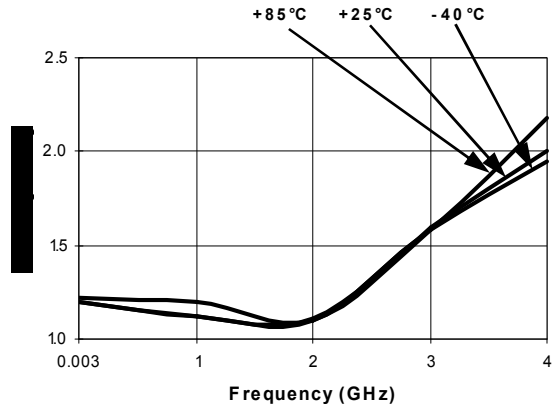
RF1 - RF4 On VSWR Temp. Variation



RFC On VSWR @ +25°C



RFC On VSWR Temp. Variation

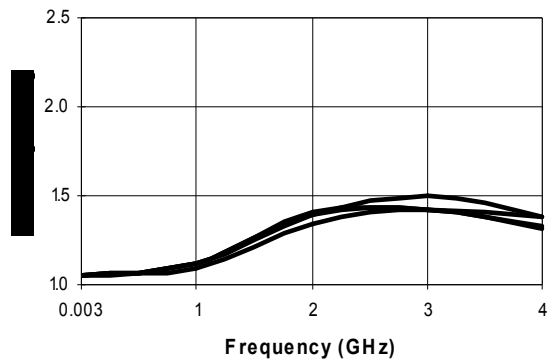


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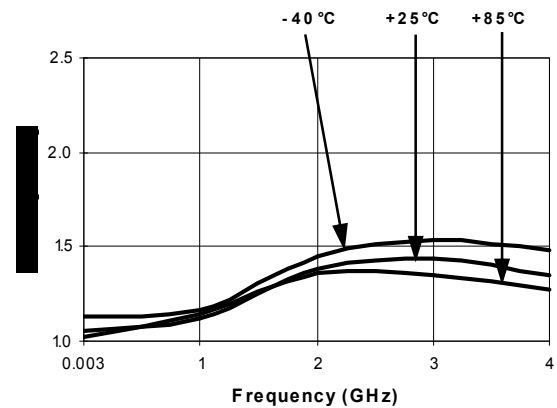
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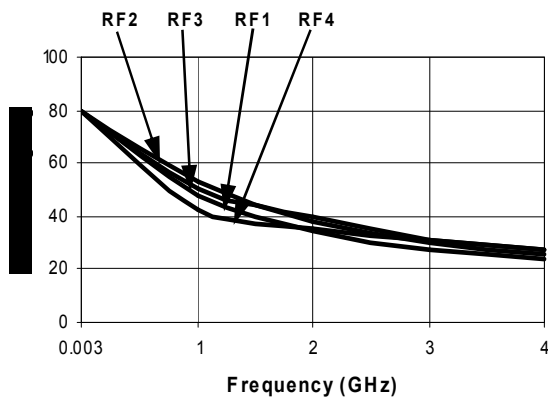
RF1 - RF4 Off VSWR @ +25°C



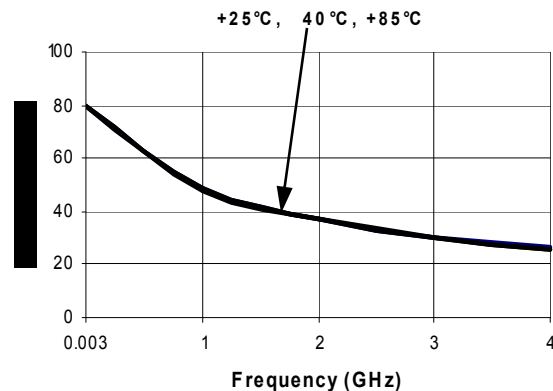
RF1 - RF4 Off VSWR Temp. Variation



Isolation (dB) @ +25°C



Isolation Temp. Variation (dB)



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