

GaAs SP4T Switch

DC - 4 GHz

MASW4060G

Features

- Low Insertion Loss, 1.2 dB Typical
- Fast Switching Speed, 4 ns Typical
- Ultra Low DC Power Consumption
- Terminated Option

Guaranteed Specifications* -55°C to +85°C

Frequency Range		DC - 4.0 GHz
Insertion Loss	DC - 0.5 GHz	1.3 dB Max
	DC - 1.0 GHz	1.3 dB Max
	DC - 2.0 GHz	1.3 dB Max
	DC - 4.0 GHz	1.7 dB Max
Isolation	DC - 0.5 GHz	50 dB Min
	DC - 1.0 GHz	45 dB Min
	DC - 2.0 GHz	40 dB Min
	DC - 4.0 GHz	30 dB Min
VSWR	DC - 0.5 GHz	1.4:1 Max
	DC - 1.0 GHz	1.4:1 Max
	DC - 2.0 GHz	1.5:1 Max
	DC - 4.0 GHz	2.0:1 Max

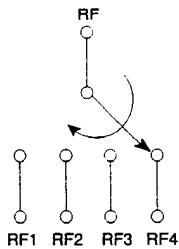
Operating Characteristics

Impedance		50 Ω Nominal
Switching Characteristics		
tRISE, tFALL (10/90% or 90/10% RF)		2 ns Typ
tON, tOFF (50% CTL to 90/10% RF)		4 ns Typ
Transients (In-Band)		20 mV Typ
Input Power for 1dB Compression		
Control Voltages (Vdc)		0/-5
0.05 GHz		+17 dBm Typ
0.5 - 4.0 GHz		+27 dBm Typ
Intermodulation Intercept Point (for two-tone input power up to +5 dBm)		
Intercept Points	IP2	IP3
0.5 GHz	+45	+35 dBm Typ
0.5 - 4.0 GHz	+60	+46 dBm Typ
Control Voltages (Complementary Logic)		
V _{IN} Low	0 to -0.2 V @ 25 μA Max	
V _{IN} Hi	-5 V @ 50 μA Typ to -5 V @ 200 μA Max	
Die Size	0.059" x 0.077" x 0.010" (1.50mm x 1.95mm x 0.25mm)	

*All specifications apply with 50 Ω impedance connected to all RF ports, 0 and 0 and -5 Vdc control voltages.

**Loss changes ±0.0025 dB/°C. (From -55°C to +85°C)

Schematic



Specifications Subject to Change Without Notice.

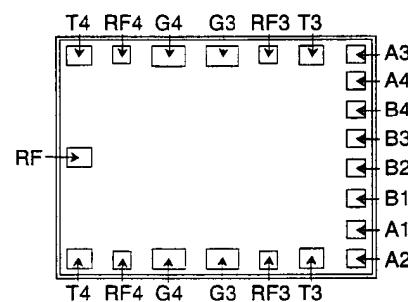
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M/A-COM, Inc.

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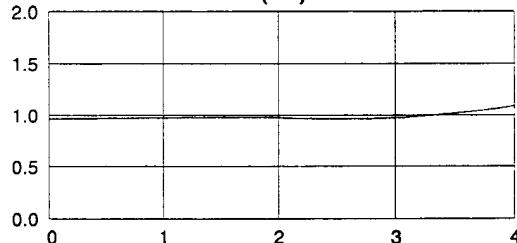
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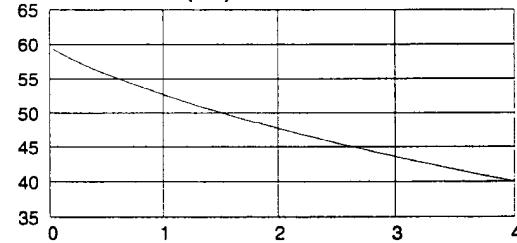


Typical Performance @ + 25°C

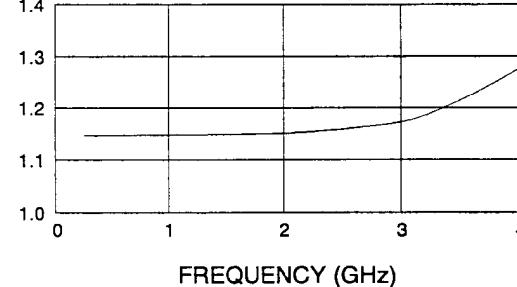
INSERTION LOSS (dB)



ISOLATION (dB)



VSWR



FREQUENCY (GHz)

Handling Precautions

Permanent damage to the MASW4060 may occur if the following precautions are not adhered to:

- A. Cleanliness — The MASW4060 should be handled in a clean environment. DO NOT attempt to clean unit after the MASW4060 is installed.
- B. Static Sensitivity — All chip handling equipment and personnel should be DC grounded.
- C. Transient — Avoid instrument and power supply transients while bias is applied to the MASW4060. Use shielded signal and bias cables to minimize inductive pick-up.
- D. Bias — Apply voltage to either control port V1 or V2 only when the other is grounded. No port should be allowed to "float".
- E. General Handling — It is recommended that the MASW4060 chip be handled along the long side of the die with a sharp pair of bent tweezers. DO NOT touch the surface of the chip with fingers or tweezers.

Mounting

The MASW4060 is back-metallized with Pd/Ni/Au(100/1,000/10,000Å) metallization. It can be die-mounted with AuSn eutectic preforms or with thermally conductive epoxy. The package surface should be clean and flat before attachment.

Eutectic Die Attach:

- A. A 80/20 gold/tin preform is recommended with a work surface temperature of approximately 255°C and a tool temperature of 265°C. When hot 90/10 nitrogen/hydrogen gas is applied, tool tip temperature should be approximately 290°C.
- B. DO NOT expose the MASW4060 to a temperature greater than 320°C for more than 20 seconds. No more than 3 seconds of scrubbing should be required for attachment.

Epoxy Die Attach:

- A. Apply a minimum amount of epoxy and place the MASW4060 into position. A thin epoxy fillet should be visible around the perimeter of the chip.
- B. Cure epoxy per manufacturer's recommended schedule.
- C. Electrically conductive epoxy may be used but is not required.

Truth Table

Control Inputs								Condition of Switch			
A1	B1	A2	B2	A3	B3	A4	B4	RF1	RF2	RF3	RF4
V _{IN} Hi	V _{IN} Low	V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	On	Off	Off	Off
V _{IN} Low	V _{IN} Hi	V _{IN} Hi	V _{IN} Low	V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	Off	On	Off	Off
V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	V _{IN} Hi	V _{IN} Low	V _{IN} Low	V _{IN} Hi	Off	Off	On	Off
V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	V _{IN} Low	V _{IN} Hi	V _{IN} Hi	V _{IN} Low	Off	Off	Off	On

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