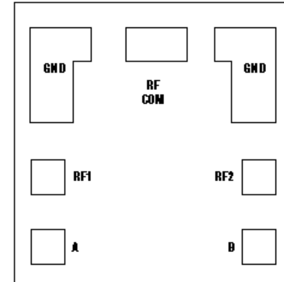
M/A-COM an AMP company

GaAs SPDT Switch DC-6 GHz

MASW6010G

V 2.00

- Low Insertion Loss, 0.5 dB Typical @ 4 GHz
- Fast Switching Speed, 4ns Typical
- Ultra Low DC Power Consumption
- Integral Static Protection



Guaranteed Specifications** @25°C***

Frequency Range MHz		DC - 6000
Insertion Loss	DC - 1.0 GHz	0.6 dB Max
	DC - 2.0 GHz	0.8 dB Max
	DC - 6.0 GHz	1.4 dB Max
Isolation	DC - 1.0 GHz	45 dB Min
	DC - 2.0 GHz	38 dB Min
	DC - 6.0 GHz	22 dB Min
VSWR	DC - 1.0 GHz	1.1:1 Max
	DC - 2.0 GHz	1.2:1 Max
	DC - 6.0 GHz	1.9:1 Max

Operating Characteristics

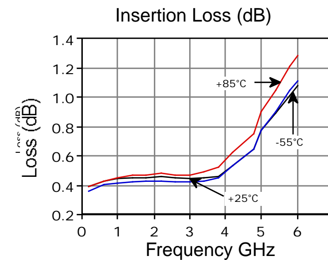
Impedance		50 Nominal
Switching Characteristics		
t_{RISE}, t_{FALL} (10/90% or 90/10% RF)		2 ns Typ
t_{ON}, t_{OFF} (50% CTL to 90/10% RF)		4 ns Typ
Transients (In-Band)		10 mV Typ
Input Power for 1 dB Compression		
Control Voltages (Vdc)	0/-5	0/-8
Above 500 MHz	+27 dBm	+33 dBm Typ
100 MHz	+21 dBm	+26 dBm Typ
Intermodulation Intercept Point (for two-tone input power up to +5 dBm)		
Intercept Points	IP_2	IP_3
Above 500 MHz	+68 dBm	+46 dBm Typ
100 MHz	+62 dBm	+40 dBm Typ
Control Voltages (Complementary Logic)		
V_{IN}Low		0 to -0.2V @ 20 µA Max
V_{IN}Hi		-5V @ 50 µA Typ to -8V @ 300 µA Max
Die Size		0.031" x 0.031" x 0.010" (0.80mm x0.80mm x 0.25mm)

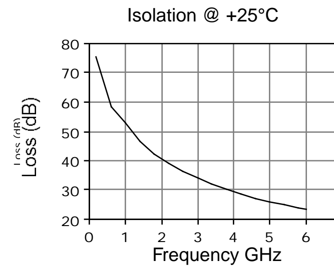
* Equivalent to Anzac SW200

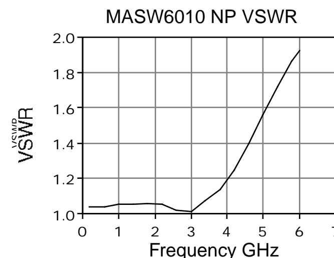
** All specifications apply with 50 impedance connected to all RF ports, 0 and -8 Vdc control voltages.

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

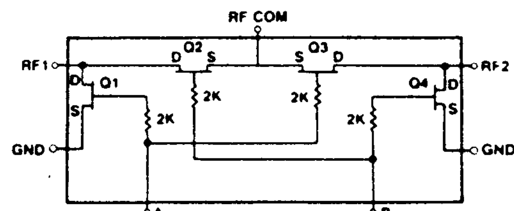
Typical Performance @ +25°C







Schematic



Handling Precautions

Permanent damage to the MASW6010 may occur if the following precautions are not adhered to:

A. Cleanliness – The MASW6010 should be handled in a clean environment. DO NOT attempt to clean unit after the MASW6010 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 MASW6010.Use shielded signal and bias cables to minimize inductive pick-up.

D. Bias – Apply voltage to either control port A/B or only when the other is grounded. Neither port should be allowed to “float”.

E. General Handling – It is recommended that the MASW6010 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 MASW6010 is back-metallized with Pd/Ni/Au (100/1,000/ 30,000Å) 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 MASW6010 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. Electrically conductive epoxy must be used.

B. Apply a minimum amount of epoxy and place the MASW6010 into position. A thin epoxy fillet should be visible around the perimeter of the chip.

C. Cure epoxy per manufacturer's recommended schedule.

Wire Bonding

A. Ball or wedge bond with 1.0 mil diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150°C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Ultrasonic energy and time should be adjusted to the minimum levels to achieve reliable wirebonds.

B. Wirebonds should be started on the chip and terminated on the package.

Truth Table

Control Input		**Condition Of Switch**	
		RFCommon To Each RF Port	
A	B	RF1	RF2
V_{in}Hi	V_{in}Low	On	Off
V_{in}Low	V_{in}Hi	Off	On

V_{in} Low 0 to -0.2V

V_{in}Hi -5V to -8V

Maximum Ratings
A. Control Voltage (A / B): -8.5 Vdc
B. Max Input RF Power: +42 dBm (500 MHz - 6 GHz)
C. Storage Temperature: -65°C to +175°C
D. Maximum Operating Temperature: +175°C

Bonding Pad Dimensions Inches (mm)
RFcom: 0.004 x 0.004 (0.100 x 0.100)
RF2,RF3: 0.004 x 0.004 (0.100 x 0.100)
A,B: 0.004 x 0.004 (0.100 x 0.100)
GND1,GND2: 0.012 x 0.004 (0.300 x 0.100)

Die Size Inches (mm)
0.031 x 0.031 x 0.010 (0.80 x 0.80 x 0.25)