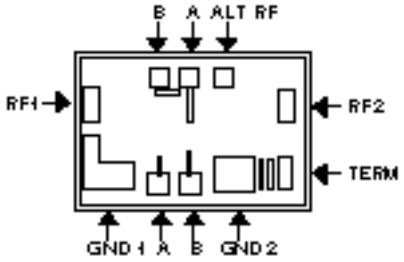
GaAs SPST Switch
DC-6 GHz

MASW6020G

V 2.00

Features

- Low Insertion Loss,0.6 dB Typical @ 1 GHz
- Fast Switching Speed,10 ns Typical
- Ultra Low DC Power Consumption
- Integral Static Protection



Guaranteed Specifications** @25°C***

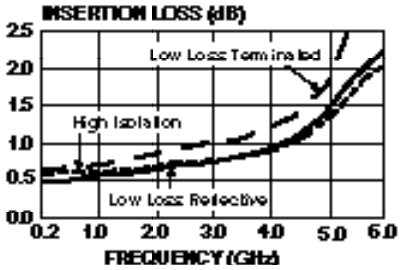
Frequency Range			DC - 6000 MHz
Insertion Loss	(L) Low Loss	Low Loss Matched	(H) High Isolation
DC-1.0 GHz	0.8 dB	1.0 dB	0.9 dB
DC-2.0 GHz	0.9 dB	1.1 dB	1.0 dB
DC-6.0 GHz	2.5 dB	2.7 dB	2.5 dB
Isolation	(L) Low Loss	Low Loss Matched	(H) High Isolation
DC-1.0 GHz	30 dB	63 dB	64 dB
DC-2.0 GHz	22 dB	46 dB	52 dB
DC-6.0 GHz	11 dB	14 dB	19 dB
VSWR	(L) Low Loss	Low Loss Matched	(H) High Isolation
DC-1.0 GHz	1.1:1	1.1:1	1.1:1
DC-2.0 GHz	1.3:1	1.2:1	1.1:1
DC-6.0 GHz	2.0:1	2.7:1	2.0:1

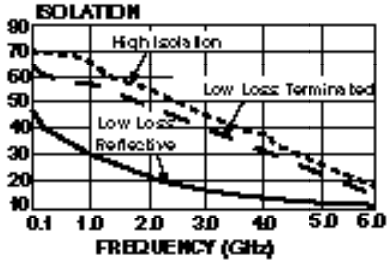
Operating Characteristics

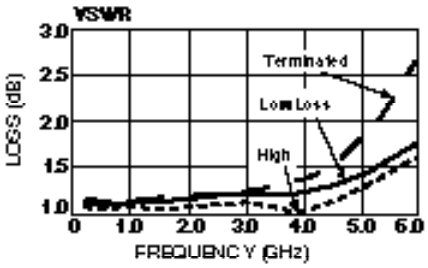
Impedance		50 Ω Nominal
Switching Characteristics		
Trise, Tfall (10%/90% or 90%/10% RF)		10 ns Typ
Ton, Toff (50% CTL to 90%/10% RF)		10 ns Typ
Transients (In-Band)		10 mV Typ
Input Power for 1 dB Compression		
Control Voltages (VDC)	0/-5	0/-8
Above 500 MHz	+27 dBm	+33 dBm Typ
100 MHz	+21 dBm	+26 dBm Typ
Intermodulation Intercept Point (for two-tone input power up to +5 dBm)		
Intercept Points	IP2	IP3
Above 500 MHz	+68 dBm	+46 dBm Typ
100 MHz	+62 dBm	+40 dBm Typ
Control Voltages (Complementary Logic)		
Vin Low		0 to -0.2V @ 20 µA Max
Vin Hi		-5V @ 50 µA Typ to -8V @ 300 µA Max
Die Size		0.031" x 0.051" x 0.010" (0.80 mm x 01.30 mm x 0.25 mm)

* Equivalent to Microelectronics Division (ANZAC) SW210H
** All specifications apply with 50 Ω impedance connected to all RF ports, 0 and -8 VDC control voltages.
*** Loss change 0.0025 dB/°C. (From -55°C to +85°C)

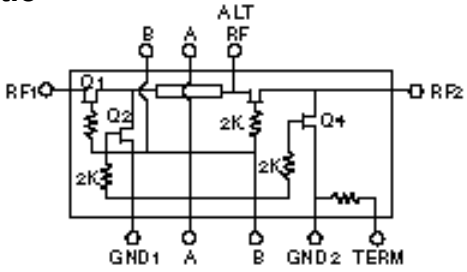
Typical Performance







Schematic



Handling Precautions

Permanent damage to the MASW6020G may occur if the following precautions are not adhered to:

A. Cleanliness – The MASW6020G should be handled in a clean environment. DO NOT attempt to clean unit after the MASW6020G 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 MASW6020G. 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 MASW6020G 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 MASW6020G 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 MASW6020G 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 MASW6020G 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. Thermo-sonic 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

Option	Control Voltage		Switch Condition & Bonding			Ground Bonds		
	A	B	RF1	RF2	ALT	GND1	GND2	Term
T	V Hi	V Low	on	on		G		G
	V Low	V Hi	off	off		G		G
L	V Hi	V Low		on	on	G	G	
	V Low	V Hi		off	off	G	G	
H	V Hi	V Low	on	on		G	G	
	V Low	V Hi	off	off		G	G	

Maximum Ratings

Control Voltage (A/B):	-8.5 VDC
Max Input RF Power:	+34 dBm (500 MHz - 4 GHz)
Storage Temperature:	-65°C to +175°C
Maximum Operating Temperature:	+175°C

Bond Pad Dimensions – Inches (mm)

RF1, RF2:	0.004 x 0.006 (0.100 x 0.150)
Alt RF:	0.004 x 0.005 (0.100 x 0.125)
A,B:	0.004 x 0.004 (0.100 x 0.100)
GND1:	0.012 x 0.007 (0.300 x 0.175)
GND2 :	0.009 x 0.008 (0.225 x 0.200)
Term:	0.004 x 0.008 (0.100 x 0.200)

Bond Pad Layout