M/A-COM
an AMP company

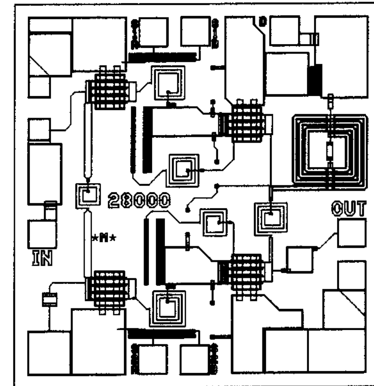
Wide Band GaAs MMIC Amplifier
2 - 8 GHz

MAAM28000

V 2.00

Features

- 18 dB Typical Gain[1]
- ±0.5 dB Typical Broadband Gain Flatness
- Single Bias Supply
- On-Chip Bias Network
- DC Decoupled RF Input and Output



Electrical Specifications @ T_A = +25°C

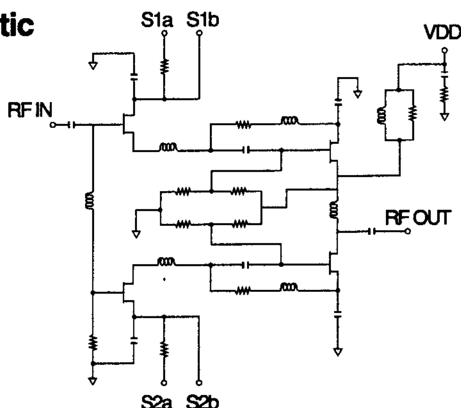
Parameter	Condition	Typ	Min/Max
Frequency Range			2.0 - 8.0 GHz
Gain[1]		18.0 dB Typ	16.0 dB Min
Gain Flatness			±0.5 dB Typ
Noise Figure[1]	2.0 – 4.0 GHz 4.0 – 6.0 GHz 6.0 – 8.0 GHz	6.0 dB Typ 4.5 dB Typ 4.0 dB Typ	7.5 dB Max 6.0 dB Max 5.5 dB Max
VSWR[1]	Input Output		1.7:1 Typ 1.3.1 Typ
Output Power at 1 dB Gain Compression			+14 dBm Typ
Third Order Intercept			+24 dBm Typ
Reverse Isolation			40 dB Typ
Impedance			50 Ω Typ
Bias Voltage			Vdd = +10 Vdc
Bias Currents			Idd = 60 mA Typ, 100 mA Max

Maximum Ratings

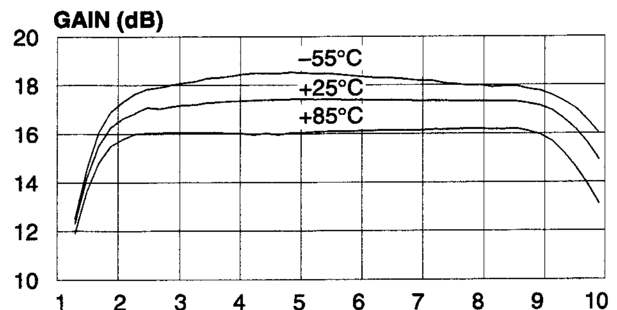
Parameter	Rating
Voltage	+14 volts
Input Power	+20 dBm
Storage Temperature	–65°C to +150°C
Operating Temperature	–55°C to +125°C

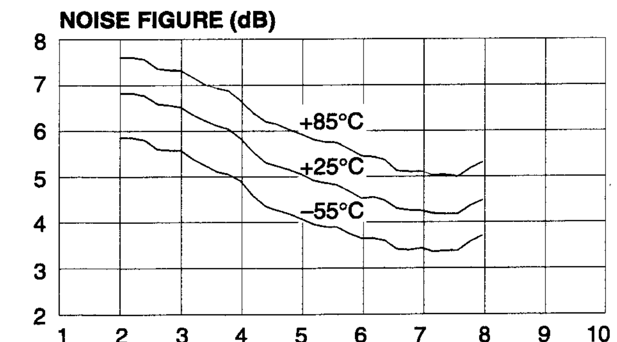
1. 100% on-wafer tested.

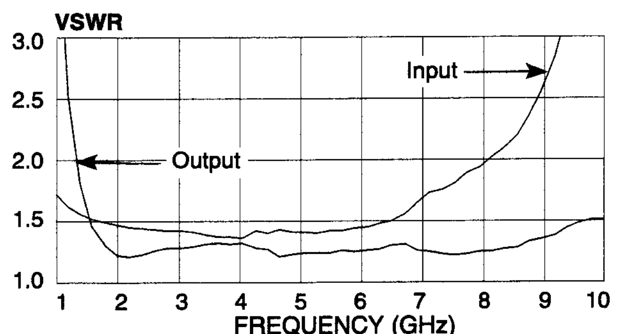
Schematic



Typical Performance







Specifications Subject to Change Without Notice.

M/A-COM, Inc.

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V 2.00

Handling

Permanent damage to the MAAM28000 may occur if the following precautions are not adhered to:

A. Cleanliness — The MAAM28000 should be handled in a clean environment. DO NOT attempt to clean assembly after the MAAM28000 is installed.

B. Static Sensitivity — All die handling equipment and personnel should comply with DOD-STD-1686 Class I.

C. Transients — Avoid instrument and power supply transients while bias is connected to the MAAM28000. Use shielded signal and bias cables to minimize inductive pick-up.

D. General Handling — DO NOT touch the surface of the die. It is recommended that the MAAM28000 die be handled along the long side with a sharp pair of tweezers.

Mounting

The MAAM28000 is back-metallized with Pd/Ni/Au (100/1,000/30,000Å) metallization. It can be die-mounted using Au/Sn eutectic preforms or a thermally and electrically conductive epoxy. The attachment surface should be clean and flat.

Eutectic Die Attach:

A. An 80/20 Au/Sn preform is recommended with a work surface temperature of approximately 255°C and a tool temperature of 265°C. When hot 95/5 nitrogen/hydrogen gas is applied, solder temperature should be approximately 290°C.

B. DO NOT expose the MAAM28000 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 is required.

B. Apply a minimum amount of epoxy and place the MAAM28000 into position. A thin epoxy fillet should be visible around the perimeter of the die.

C. Cure epoxy per manufacturer's recommended schedule.

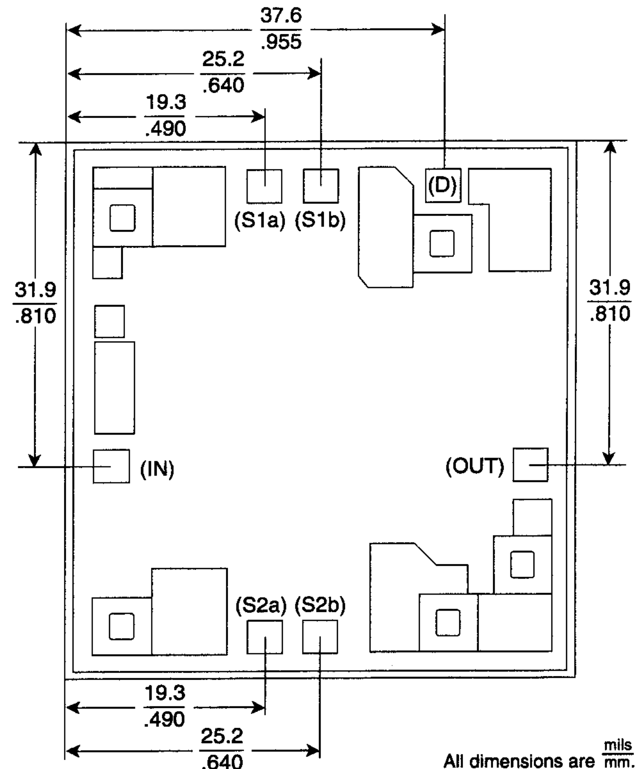
Bonding

A. Ball or wedge bond with 1.0 mil diameter gold wire or 3.0 mil x 0.5 mil ribbon. Thermosonic bonding 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 necessary to achieve reliable bonds.

B. Bonds should be started on the die and terminated on the package.

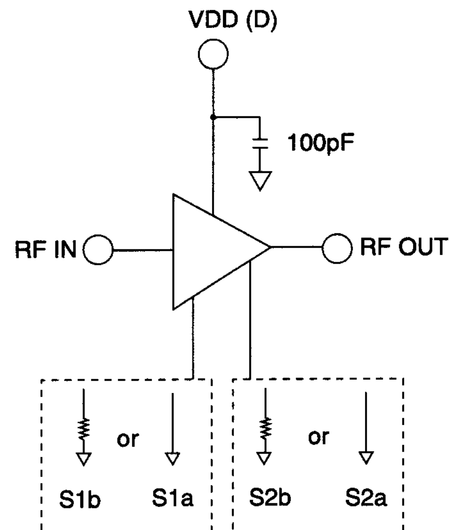
C. Bonding pads are 4.0 x 4.0 mils.

Outline



Die Size	0.051" X 0.053" X 0.004" (1.298mm X 1.349mm X 0.102mm)

Typical Bias Configuration



1. Nominal bias is obtained with on-chip resistors by grounding pads S1a and S2a.
2. Optional biasing can be obtained with off-chip resistors bonded from pads S1b and S2b to ground. Adjusting the bias can customize the performance to suit special requirements.

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