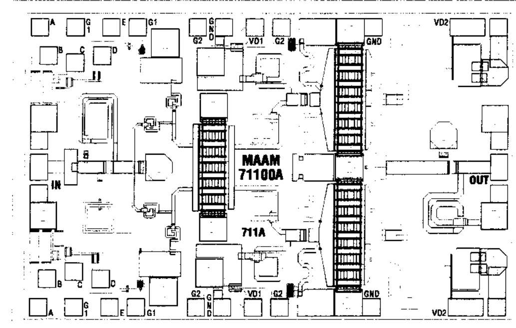
GaAs MMIC Power Amplifier 7 -11 GHz

MAAM71100

V 2.00



Features

- +31 dBm Typical Saturated Power
- 18 dB Typical Gain
- 30% Typical Power Added Efficiency
- On-Chip Bias Network
- DC Decoupled RF Input and Output

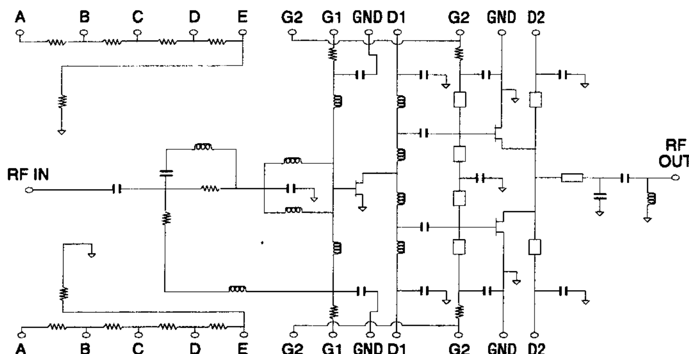
Guaranteed Specifications @ T_A = +25°C

Frequency Range		7.0 – 11.0 GHz
Gain[1]	18.0 dB Typ	14 dB Min
VSWR[1]	Input Output	2.0:1 Typ 4.5:1 Typ
Saturated Power Output[1] (Input Power = +18 dBm)		+31 dBm Typ
Output Power at 1 dB Gain Compression		+28 dBm Typ
Third Order Intercept		+38 dBm Typ
Reverse Isolation		30 dB Typ
Impedance		50 Ω Typ
Bias Voltage		V_{DD} = +8 V_{DC}, V_{GG} = -1.2 V_{DC} Typ
Bias Current	No RF P_{IN} = +18 dBm	I_{DD} = 520 mA Typ I_{DD} = 750 mA
Typ		
Thermal Resistance[2]		12°C/W Typ

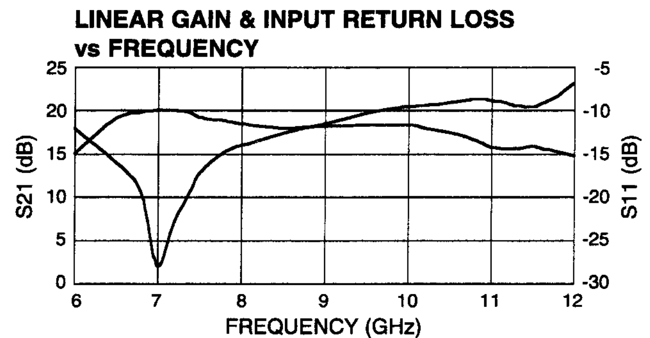
Maximum Ratings

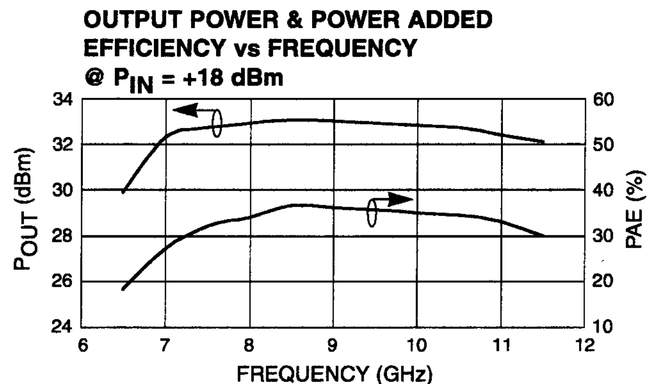
Voltage	V_{DD} = +10 Volts, V_{GG} = -5 Volts
Input Power	+23 dBm
Storage Temperature	–65°C to +150°C
Operating Channel Temperature	+150°C

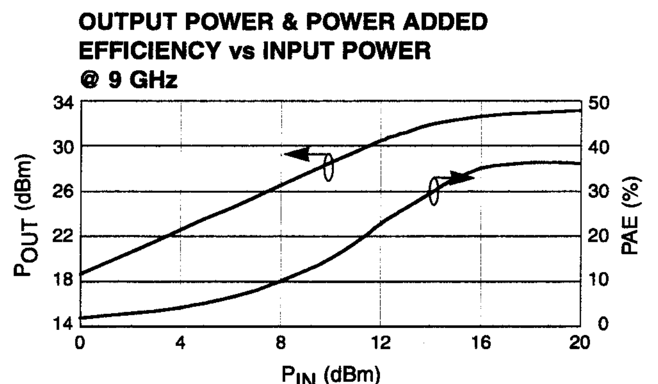
Schematic



Typical Performance







Specifications Subject to Change Without Notice.

M/A-COM, Inc.

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Handling

Permanent damage to the MAAM71100 may occur if the following precautions are not adhered to:

A. Cleanliness — The MAAM71100 should be handled in a clean environment. DO NOT attempt to clean assembly after the MAAM71100 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 MAAM71100. 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 MAAM71100 die be handled along the long side with a sharp pair of tweezers.

Mounting

The MAAM71100 is back-metallized with Pd/Ni/Au (100/1,000/30,000Å) metallization. It is recommended that the die be mounted with Au/Sn eutectic preforms. The attachment surface should be clean and flat.

A. An 80/20 preform is recommended with a work surface temperature of approximately 255°C and a tool temperature of 265°C. When hot 90/5 nitrogen/hydrogen gas is applied, solder temperature should be approximately 290°C.

B. DO NOT expose the MAAM71100 to a temperature greater than 320°C for more than 20 seconds. No more than 3 seconds of scrubbing should be required for attachment.

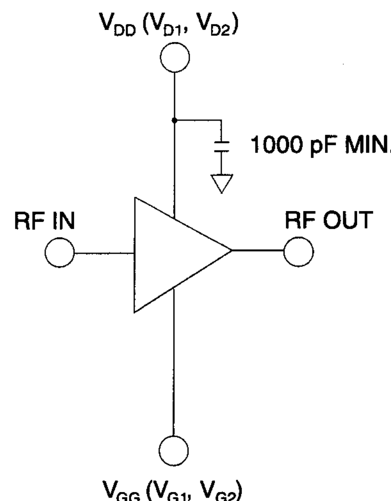
Bonding

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. minimum.

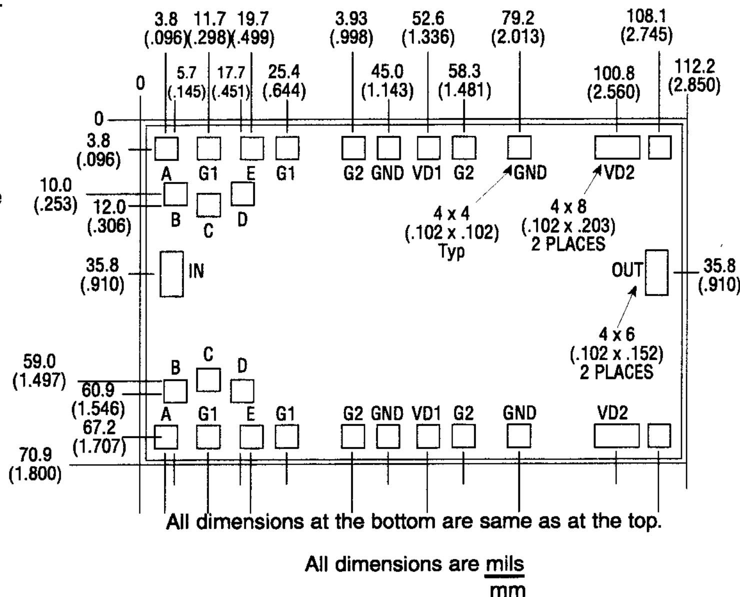
Typical Bias Configuration



1. Nominal bias is obtained by first connecting -1.2 volts to pads V_{G1} and V_{G2} followed by connecting +8 volts to pads V_{D1} and V_{D2} (note sequence).
2. The recommended V_{DD} range is +6 to +9 volts.
3. Optional on-chip resistor networks are used by connecting a nominal -5 volts to pad "A" and connecting pad "B", "C", "D", or "E" to pads V_{G1} and V_{G2}.

Die Size

0.113" X 0.072" X 0.004"
(2.88mm X 1.82mm X 0.10mm)



All dimensions are mils / mm

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