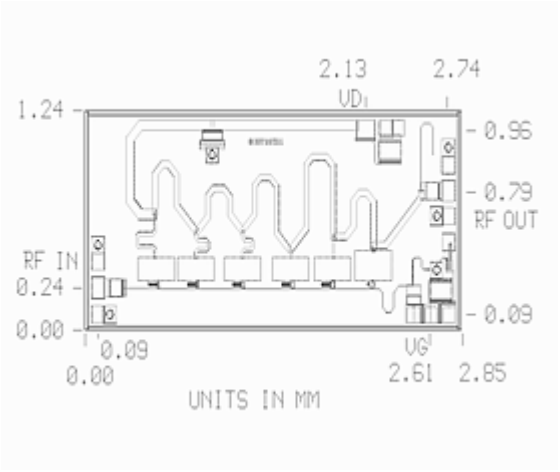
MMA-022025B

2 - 20 GHz GaAs MMIC Power Amplifier Data Sheet March 2007

Features:

- **Usable Frequency Range: 1 - 22 GHz**
- **P1dB: +27 dBm**
- **Gain: 7.5 dB**
- **Fully Matched Input/Output**
- **On-Chip DC Bias RF Choke**
- **On-Chip Input/Output DC Blocking**
- **Die Size: 2.85 x 1.24 x 0.1 mm**
- **Robust 0.25um pHEMT Technology**
- **MTTF > 1.0E6 hours @ +85 °C Ambient**



Description:

The MMA-022025B is a 2 - 20GHz broadband amplifier with typical 27dBm output power at 1 dB compression point. The MMIC chip is realized in advanced 0.25um AlGaAs/InGaAs pHEMT technology. The usable frequency range extends to 1 – 22 GHz. With on-chip input/output blocking capacitors and DC supply RF choke circuitry, it only requires simple DC bias circuits and RF connections for broad range applications.

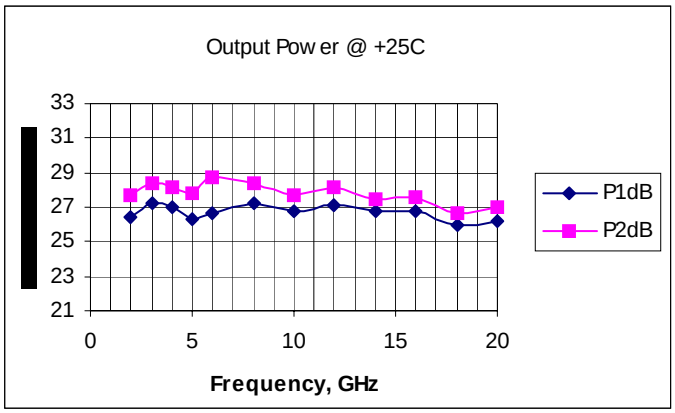
Electrical Specifications: (At VDD = + 8.0V, IDD = 290 mA, VGG = - 0.40V, T_A =25 °C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range	GHz	2		20
Small Signal Gain	dB	6.5	7.5	
Gain Flatness	+/-dB		1.2	
Input Return Loss	dB		-10	-7.5
Output Return Loss	dB		-10	-8
Output P1dB	dBm	+26	+27	
DC Drain Voltage, VDD	V		+8.0	+9.5
DC Gate VGG (~ 1mA)	V	-2.0	-0.4	0.0
DC Current, IDD	mA		290	350
Thermal Resistance	°C/W		32	

MEASURED DATA (1)

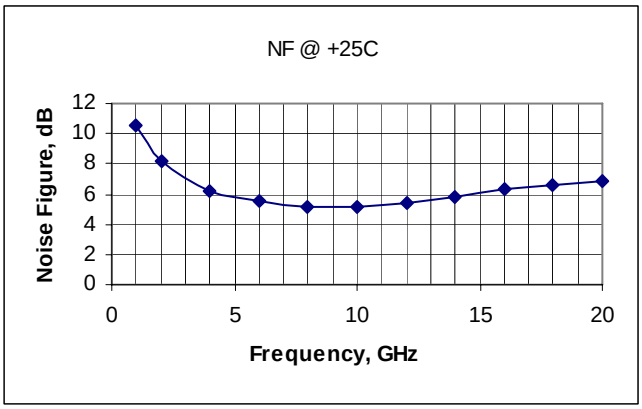
Output Power

VDD = +8.0V, IDD = 290mA, VG = -0.40V

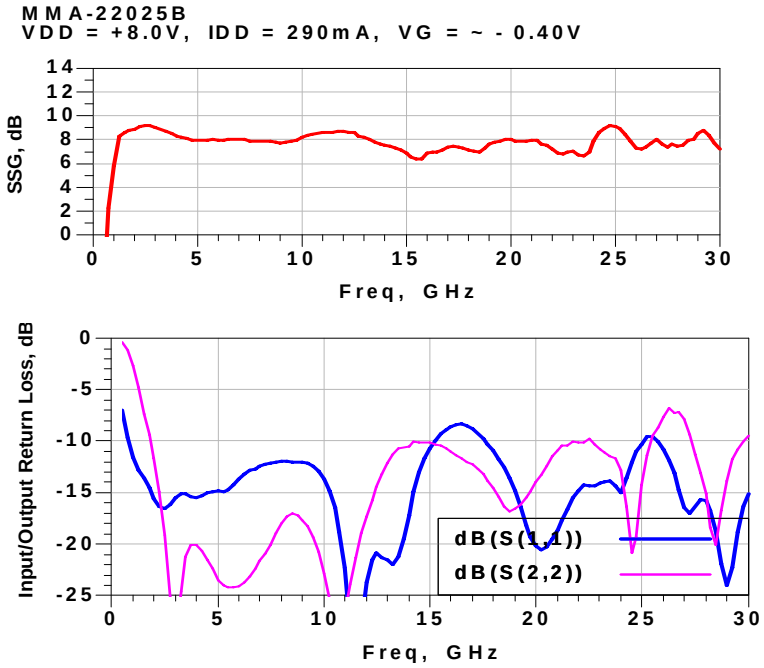


Noise Figure

VDD = +8.0V, IDD = 290mA, VG = -0.50V



Small Signal Gain and VSWR at +25°C



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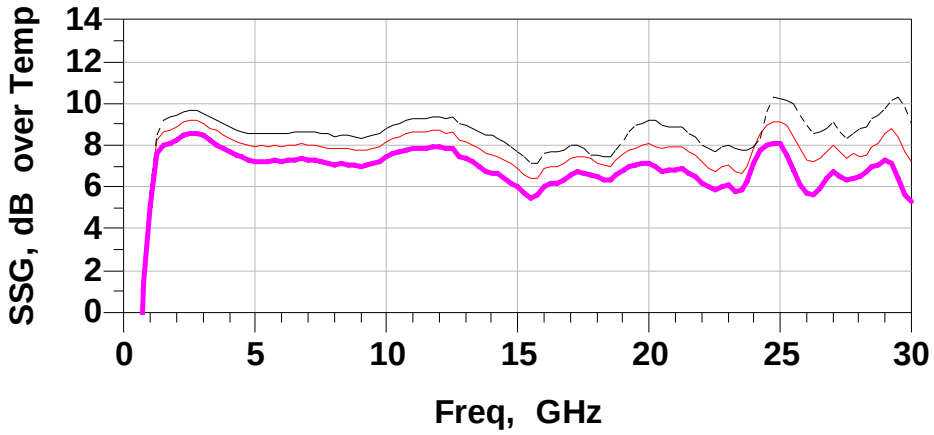
Small Signal Gain over Temperature Range

MMA-22025B
VDD = +8.0V, IDD = 290mA, VG = ~ - 0.40V



_____ @ +25 ºC, _____ @ -40 ºC, _____ @ +85 ºC

(1) Test module per the assembly diagram of this data sheet. Connector (SMA, x2) plus microstrip line losses, ~ 0.23dB at 10GHz, and 0.45dB at 20GHz, each at RF input and RF output, are de-embedded. Data include RF bond-wires.

Absolute Maximum Ratings (*):

Parameter	Rating
Drain Voltage, VDD	+ 9.5 V
Gate Voltage, VGG	- 2 V
Current, IDD	400 mA
Channel Temperature	+175 ºC
Operating Temperature	-55 ºC to +85 ºC
Storage Temperature	-65 ºC to +175 ºC
RF Input Power	+ 25 dBm

(*) Operation exceeding the limits can cause permanent damage.

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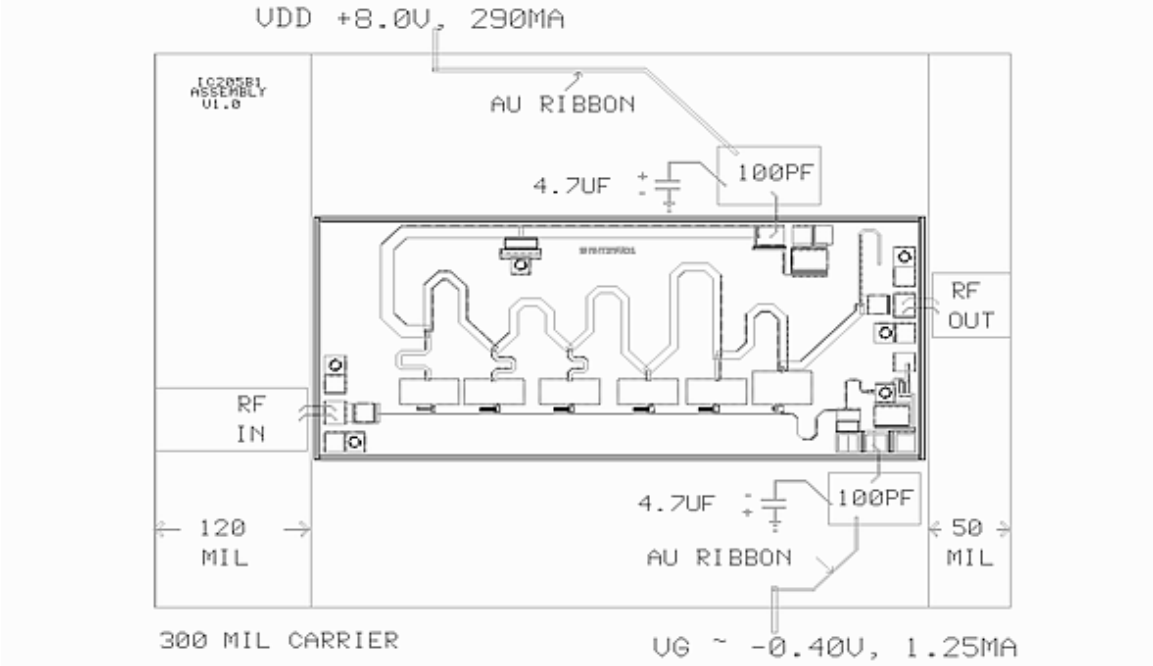
MMA-022025B Bonding/Assembly Diagram



Bonding/Assembly Recommendations:

1. Use epoxy with good thermal and electrical conductivity to attach the device. Curing temperature should maintain at approximately +150 °C.
2. Use 1.0 mil diameter Au wire, 2 parallel each pad for RF input and output pads. Keep the wire length less than 10 mils to minimize its impact to high frequency performance.

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