GPA -008020A

GaAs MMIC Power Amplifier Chip, 0.8-2GHz

Performance characteristics

Frequency range: 0.8-2GHz
Small Signal Gain: 33 dB
P-1dB: 30 dBm
Psat: 30.5 dBm
PAE : 39%
Power supply: +8 V / 215m A
50Ohm input/output
100% on-chip testing
Chip size: 2.66 x 2.16 x 0.1mm

Product Introduction

GPA-008020A is a broadband high-gain, high-efficiency, high- power amplifier chip based on GaAs technology , covering a frequency range of 0.8~2.0GHz, a small signal gain of 33 dB, a P-1 output power of 30 dBm , and a saturation efficiency of 39% . The chip via metallization process ensures good grounding, and the back side is metallized for eutectic sintering process.

Use restriction parameter [1]	
Maximum drain voltage	+10 V
Maximum gate bias	- 3 V
Maximum input power	+20 dBm
Operating temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

【1】 Exceeding any of these maximum limits may cause permanent damage.

Electrical parameters (Ta=+25°C, Vd=+ 8 V, Ids= 215 mA)				
index	Minimum	Typical Value	Maximum	unit
Frequency Range		0.8 - 2.0		GHz
Small Signal Gain	32	33	34	dB
Gain Flatness		± 1.0		dB
P-1dB	29	30	-	dBm
Psat	30	30.5	-	dBm
PAE	-	39	-	%
Input return loss	10	13	-	dB
Output return loss	11	14	-	dB
* By tuning the Vg terminal voltage -2V~0V , the recommended gate voltage is -0.85V.				

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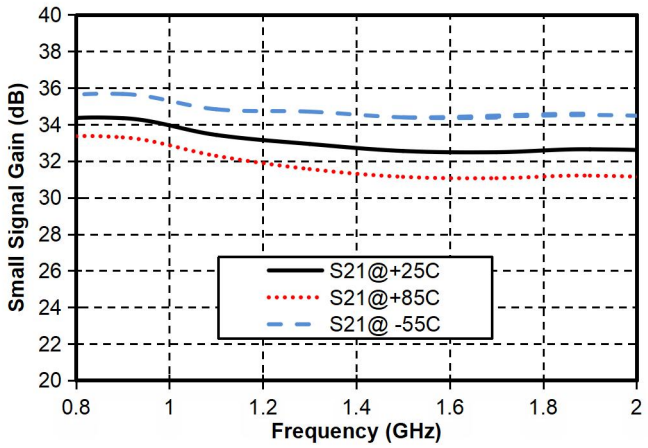
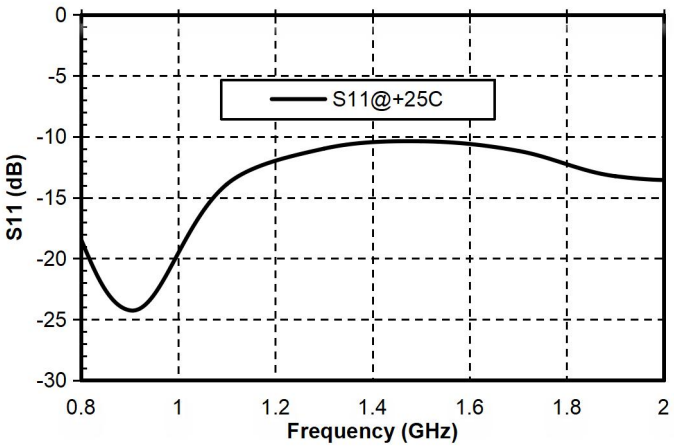
Main index test curve

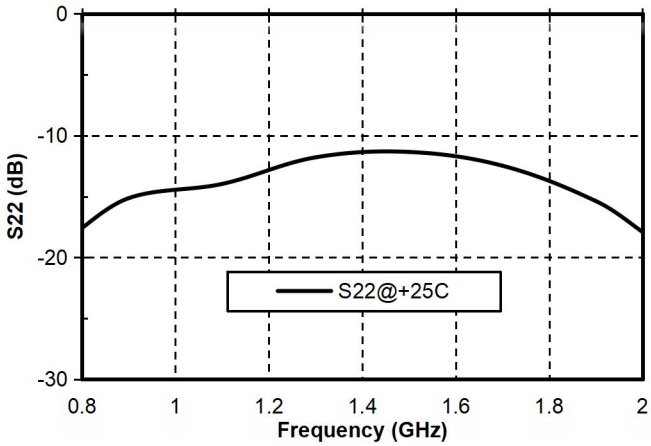
Gain vs. Frequency



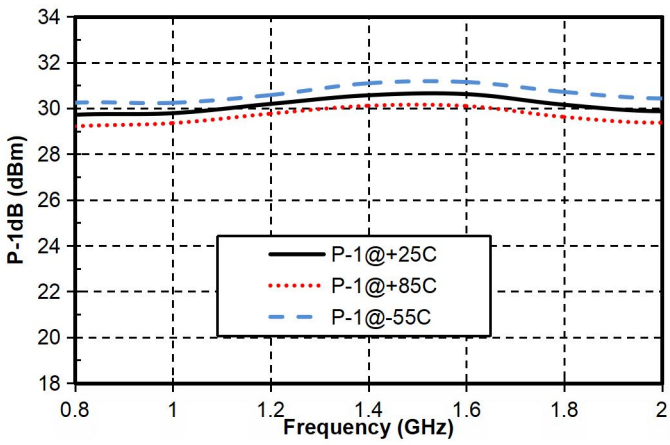
Input Return Loss vs. Frequency



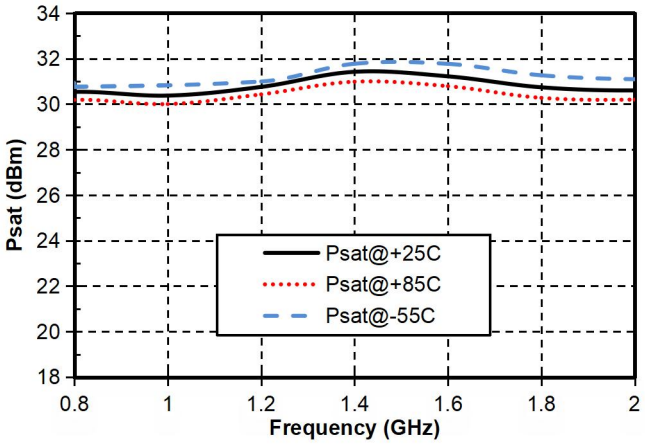
Output Return Loss vs. Frequency



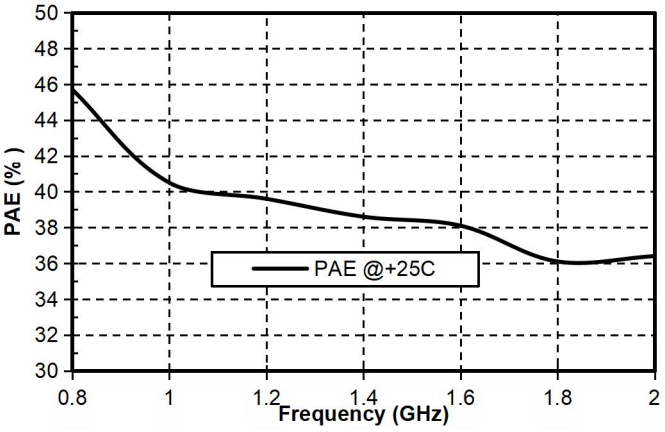
P-1dB vs. Frequency



Psat vs. Frequency



P AE vs. Frequency



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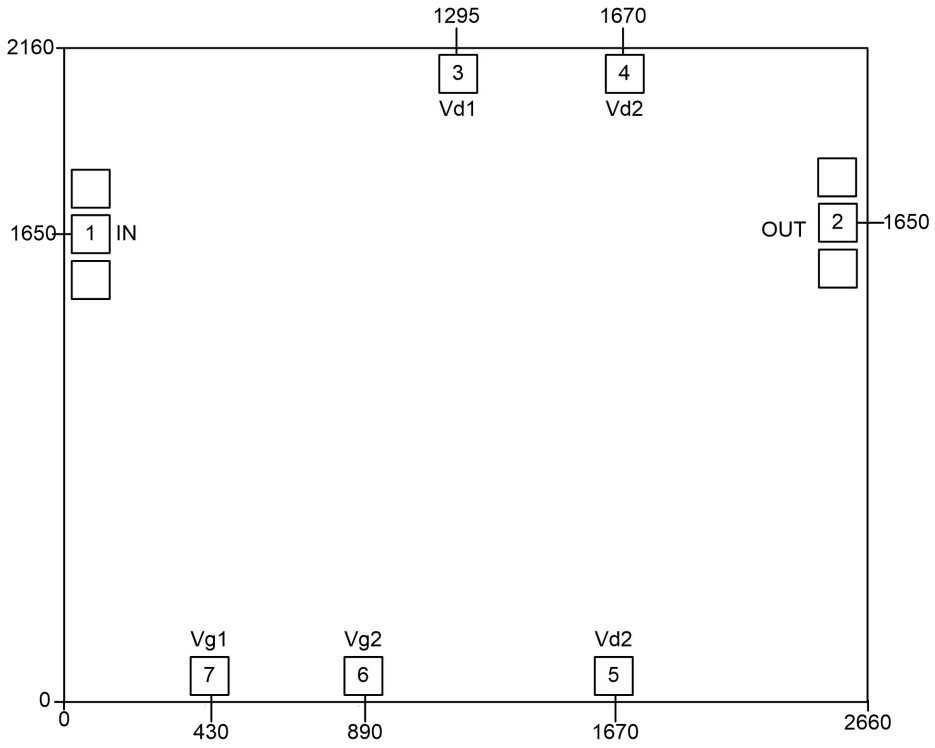
Appearance structure [2]



【 2 】All units in the figure are micrometers

Bonding point definition		
Bonding point number	Function Symbol	Functional Description
1	RF IN	The signal input terminal is connected to a 50 ohm circuit, and no DC blocking capacitor is required.
2	RF OUT	The signal output terminal is connected to a 50 ohm circuit, and no DC blocking capacitor is required.
3, 4, 5	V D1~2	Amplifier drain bias, external 100pF , 1000pF , 4.7uF bypass capacitors are required.
6, 7	VG	Amplifier drain bias, external 100pF , 1000pF , 4.7uF bypass capacitors are required.
Chip bottom	GND	The bottom of the chip needs to be in good contact with the RF and DC grounds.

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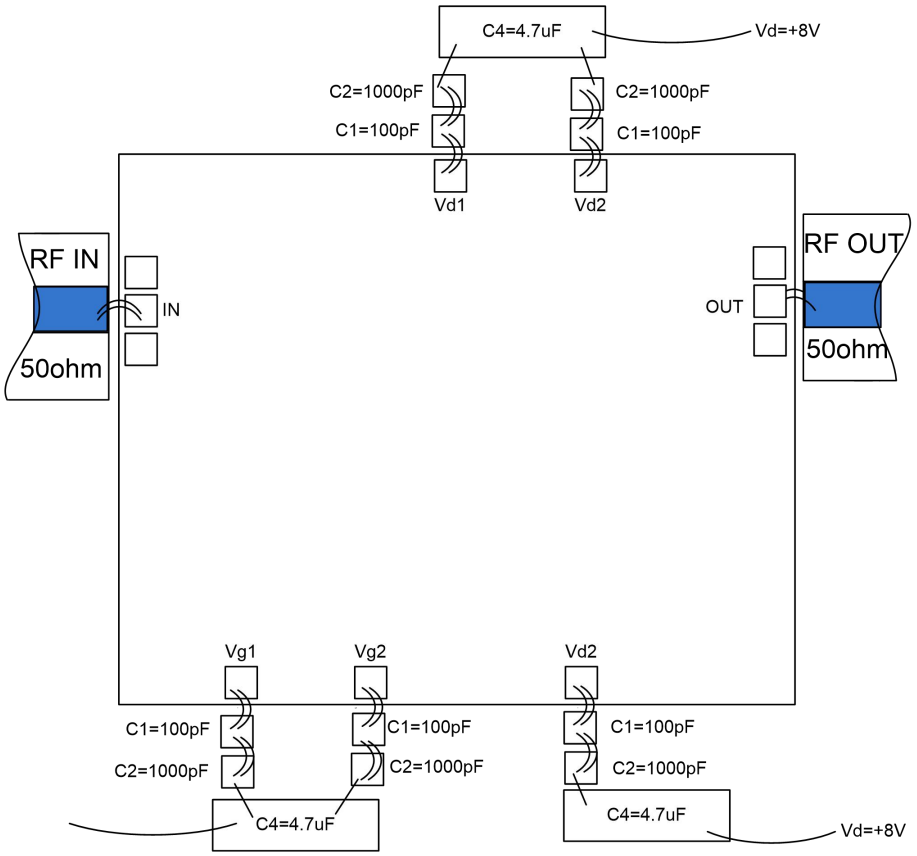
Recommended assembly diagram



Notice

- The chip must be stored in an anti-static container and kept in a nitrogen environment.
- Do not attempt to clean the bare die surface using wet chemical methods.
- Please strictly follow the ESD protection requirements to avoid static damage to the bare chip.
- General operation: Please use precision pointed tweezers to pick up bare chips. Avoid touching the chip surface with tools or fingers during operation.
- Rack mounting operation suggestions: AuSn solder eutectic sintering process can be used for bare chip mounting. The mounting surface must be clean and flat.
- Sintering process: It is recommended to use AuSn solder sheets with a gold-tin ratio of 80/20. The working surface temperature reaches 255 ℃ and the tool (vacuum chuck) temperature reaches 265 ℃ . When the high-temperature mixed gas (nitrogen-hydrogen ratio of 90/10) is blown to the chip, the temperature at the top of the tool should be raised to 290 ℃ . Do not let the chip exceed 320 ℃ for more than 20 seconds. The friction time should not exceed 3 seconds.
- Bonding operation suggestions: Use Φ0.025mm (1mil) gold wire for both ball and wedge bonding. Thermosonic bonding temperature is 150 ℃ . The pressure of the wedge bonding knife is 40~50gf for ball bonding and 18~22gf for wedge bonding. Use the smallest possible ultrasonic energy. The bonding starts at the pressure point on the chip and ends at the package (or substrate).