GPA-0920B

GaAs MMIC Power Amplifier Chip, 9-20GHz

Performance characteristics

Frequency range: 9-20GHz
Small Signal Gain: 26 dB
P-1dB: 28 dBm @+5V, 29.5 dBm @+6V
Psat: 28.5 dBm @+5V, 30 dBm @+6V
Power supply: +5 V / 520m A, +6 V / 470m A
50Ohm input/output
Chip size : 2.55 x 1.15 x 0.1mm

Use restriction parameter [1]

Maximum drain voltage	+8 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.

Product Introduction

GPA -0920B is a broadband power amplifier chip based on GaAs technology, covering a frequency range of 9~20GHz, with a small signal gain of 26 dB and a P-1 output power of 28dBm. The chip can work at +6V, with a P-1 output power of 29.5dBm when working at +6V. The chip's via metallization process ensures good grounding, and the back side is metallized, which is suitable for eutectic sintering process.

Electrical parameters (Ta=+25°C, Vd=+ 5 V, Ids= 520 mA)

index	Minimum	Typical Value	Maximum	unit
Frequency Range		9-20		GHz
Small Signal Gain	25	26	28	dB
Gain Flatness		± 1.5		dB
P-1dB	26	28	-	dBm
Psat	26.5	28.5	-	dBm
Input return loss	-	17	-	dB
Output return loss	-	15	-	dB
* By tuning the Vg terminal voltage -2V~0V , the recommended gate voltage is -0.85V.				

Electrical parameters (Ta=+25°C, Vd=+ 6 V, Ids= 470 mA)

Frequency Range		9-20		GHz
Small Signal Gain	24	25.5	27	dB
Gain Flatness		± 1.5		dB
P-1dB	28.5	29.5	-	dBm
Psat	29	30	-	dBm
Input return loss	-	17	-	dB
Output return loss	-	15	-	dB
* By tuning the Vg terminal voltage -2V~0V , the recommended gate voltage is -0.9V.				

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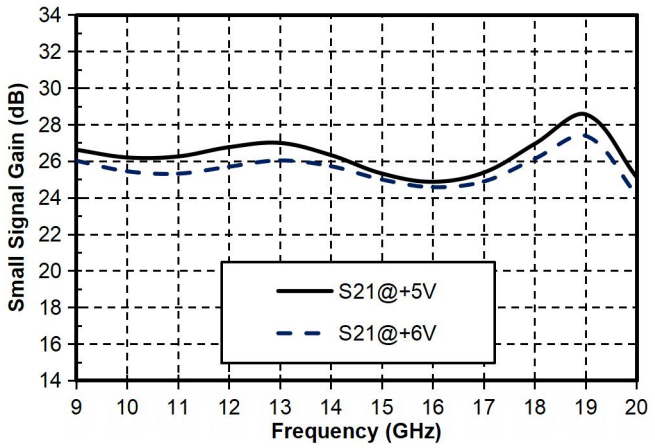
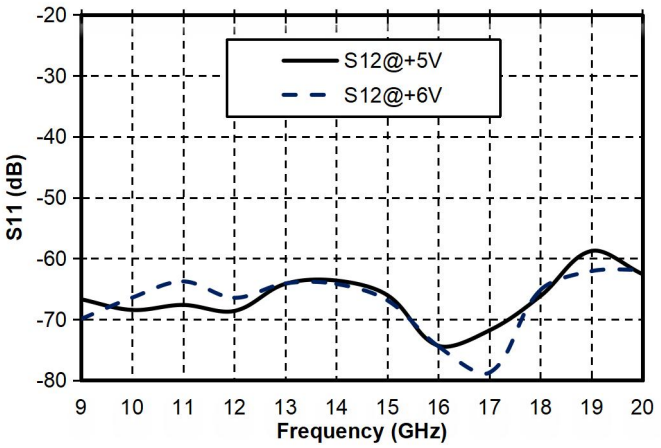
Main index test curve

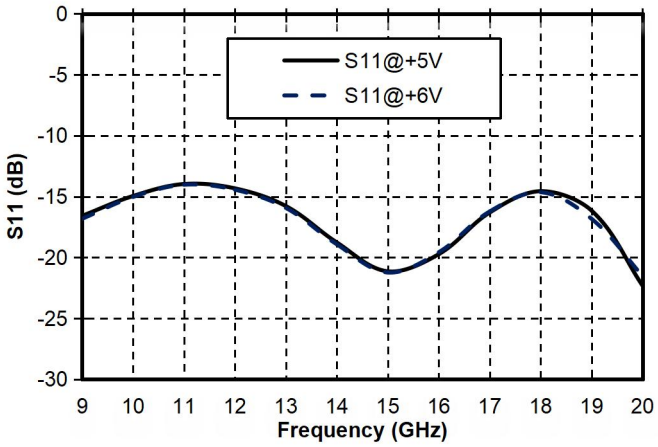
Gain vs. Frequency



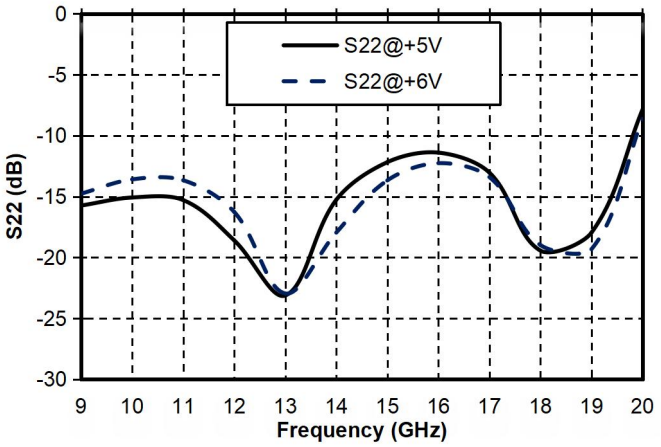
Reverse Isolation vs. Frequency



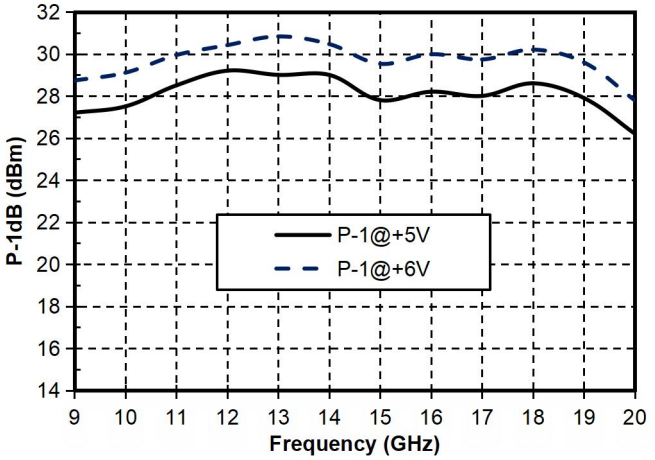
Input Return Loss vs. Frequency



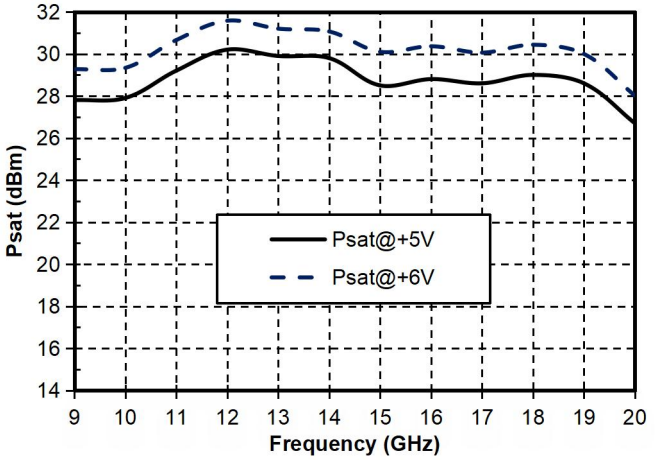
Output Return Loss vs. Frequency



P-1dB vs. Frequency



Psat vs. Frequency



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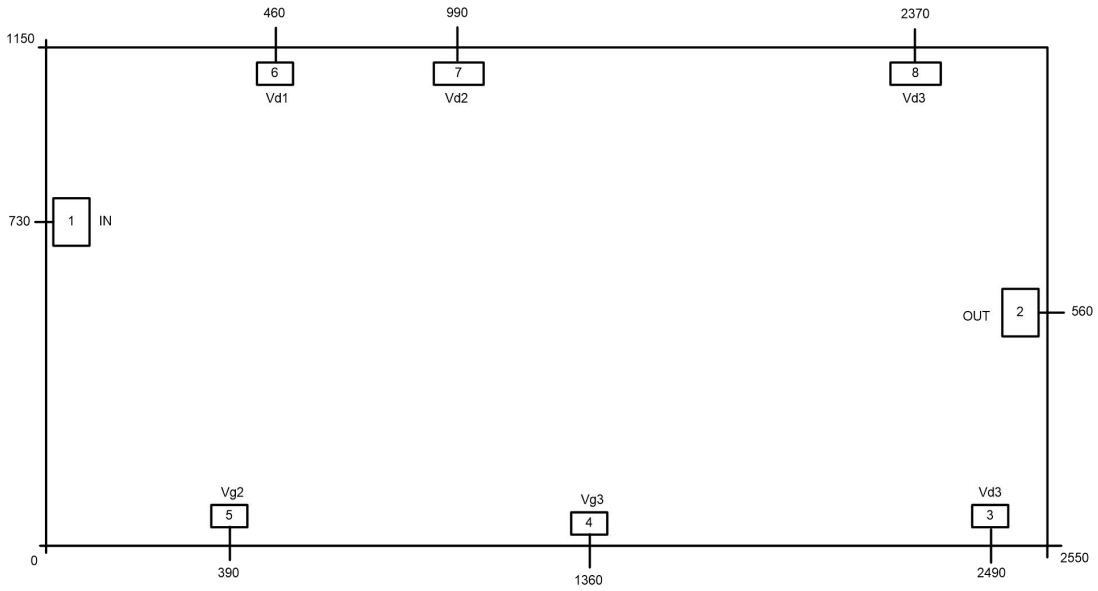
Appearance structure [2]



【 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, 6, 7, 8	V D1~3	Amplifier drain bias, requires external 10 pF, 1000 pF, 100 nF bypass capacitor
4, 5	VG	Amplifier gate bias, external 10 pF, 1000 pF, 100 nF bypass capacitor 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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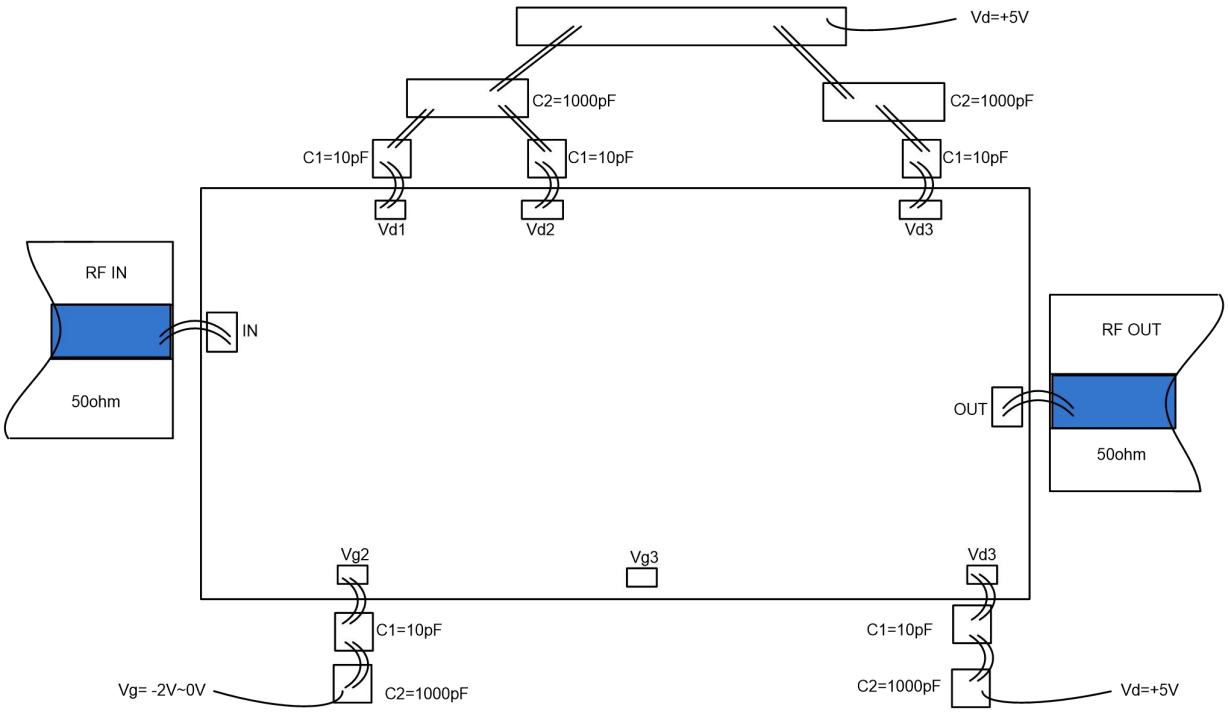
Recommended assembly diagram



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 ˚C and the tool (vacuum chuck) temperature reaches 265 ˚C . 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 ˚C . Do not let the chip exceed 320 ˚C 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 ˚C . 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).