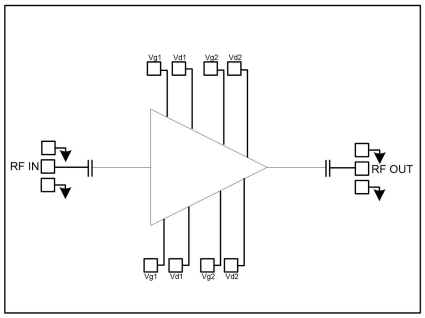
GPA -1828A

GaAs MMIC Power Amplifier Chip, 18-28GHz

Performance characteristics

Frequency range: 18-28GHz
Small Signal Gain: 13 dB
P-1dB: 29 dBm
Psat: 30.5 dBm
Power supply: 6V@630mA ~ 7V @ 600mA
50Ohm input/output
100% on-chip testing
Chip size: 2.1 x 1.3 x 0.1mm

Functional Block Diagram



Product Introduction

GPA-1828A is a broadband high-gain, high-efficiency, high- power amplifier chip based on GaAs technology , covering a frequency range of 18~28GHz, a small signal gain of 13dB, and a Psat output power of 30dBm. 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	+9 V
Maximum gate bias	- 3 V
Maximum input power	+25 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= 7 V, Vg=-0.8V, Ids= 600 mA)				
index	Minimum	Typical Value	Maximum	unit
Frequency Range		18-28		GHz
Small Signal Gain	11.5	13	14	dB
Gain Flatness		± 0.75		dB
P-1dB	28.5	29	30.5	dBm
Psat	30	30.5	31	dBm
Input return loss	12	17	-	dB
Output return loss	19	24	-	dB
* By tuning the Vg terminal voltage -2V~0V , the recommended gate voltage is -0.8V.				

Add: 101 cecil street #14-10, tong eng building singapore 069533
Email: info@standardcircuit.com
Web: www.standardcircuit.com
Tel: +65 82613258

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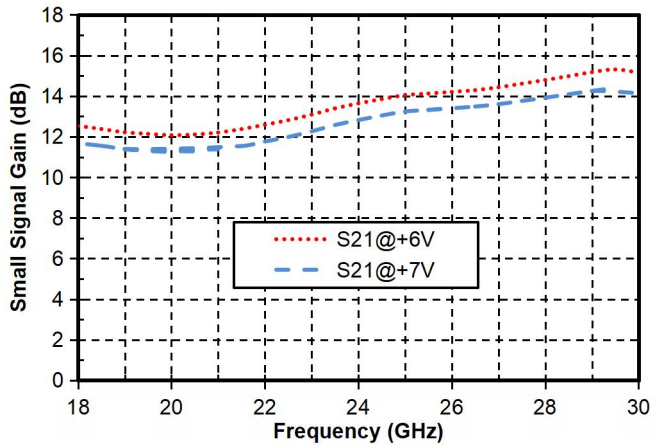
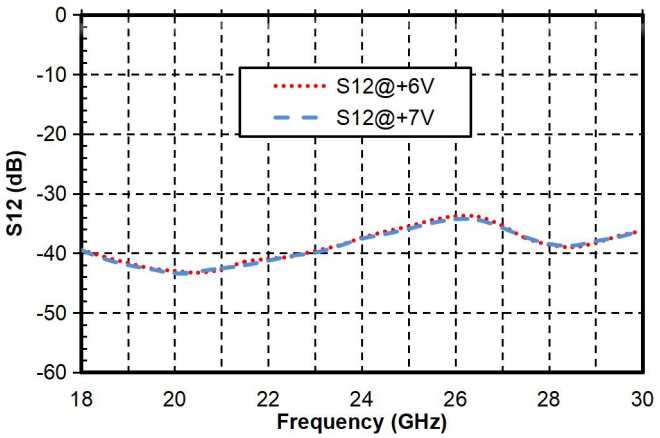
Main index test curve

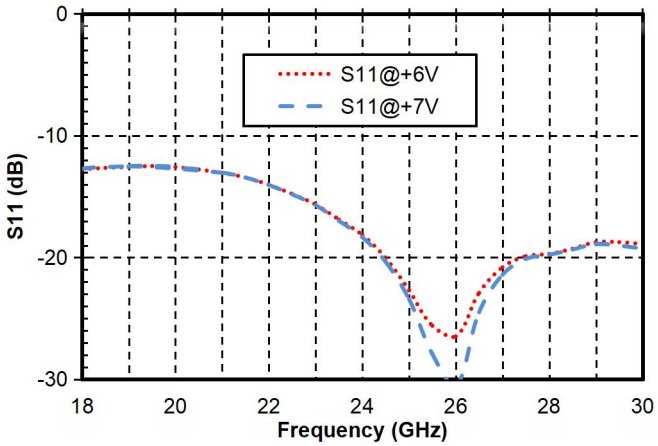
Gain vs. Frequency



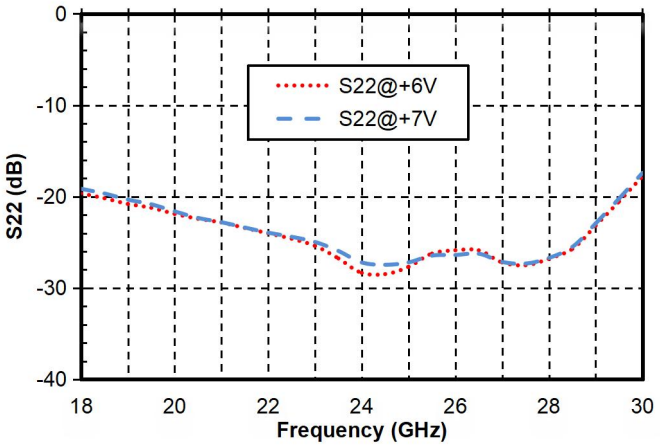
Reverse Isolation vs. Frequency



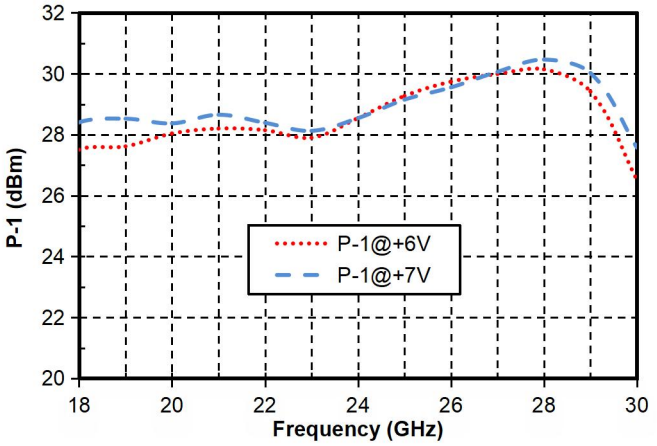
Input Return Loss vs. Frequency



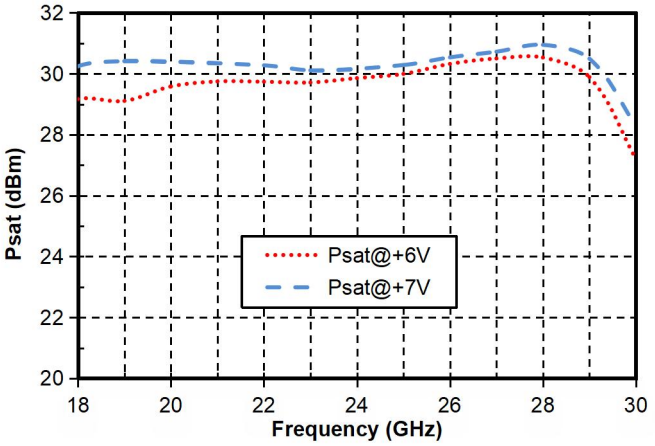
Output Return Loss vs. Frequency



P-1dB vs. Frequency



Psat vs. Frequency



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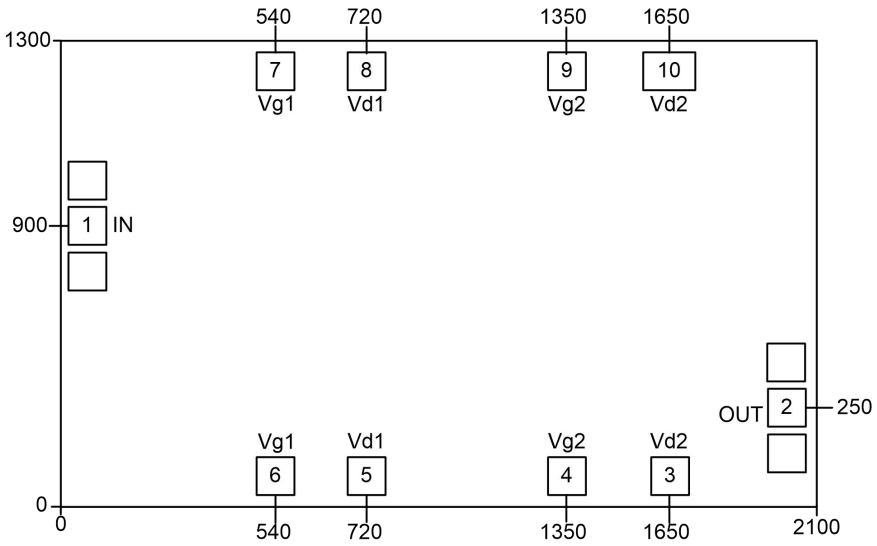
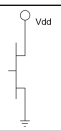
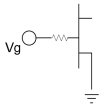
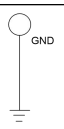
Appearance structure [2]



【 2 】All units in the figure are micrometers

Bonding point definition			
Bonding point number	Function Symbol	Functional Description	Equivalent Circuit
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, 8, 10	V D1~2	Amplifier drain bias, external 10pF , 1000pF , 4.7uF bypass capacitors are required.	
4, 6, 7, 9	VG1~2	Amplifier gate bias, external 10pF , 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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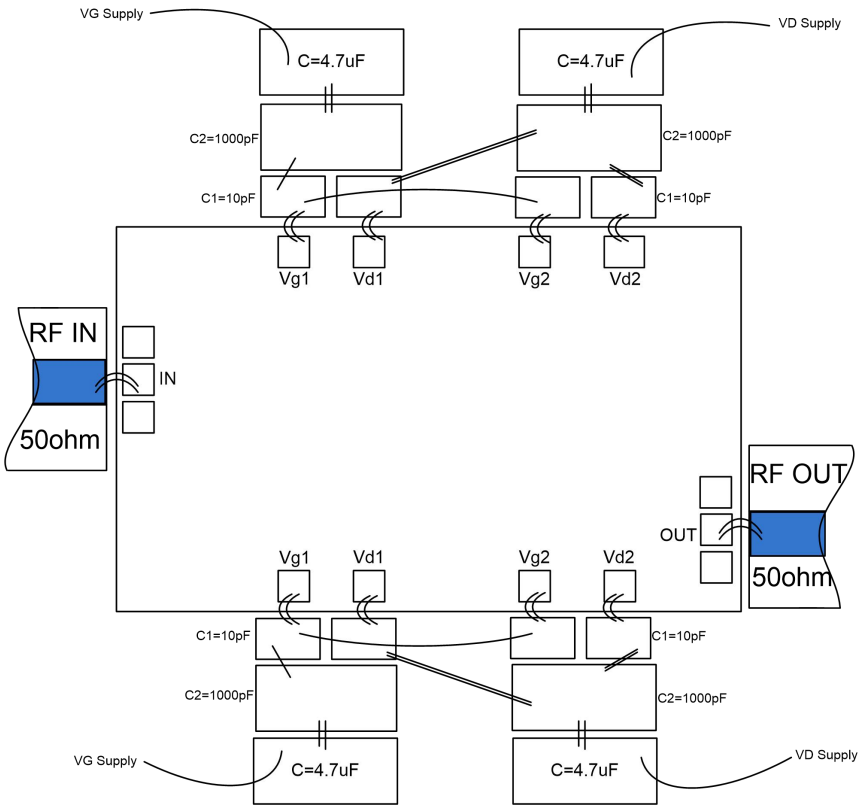
Recommended assembly diagram



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).