Standard Circuit

GPA-00125
Power Amplifier Chip

Performance Characteristics

✧ Frequency range： DC~125GHz

✧ Typical values of linear gain:10dB@DC~110GHz, 7dB@110~125GHz

✧ DC power supply: Yd=45V@Id=48mA(Vg1=-0.4V,Vg2=1.1V)

✧ Chip size: 1.70mmx1.00 mmx0.07 mm

Product Introduction

Ultra wideband power amplifier chip, with a frequency range covering DC~125GHz. The typical value of DC~110GHz linear gain is better than I0dB, and the typical value of reverse isolation is better than 30dB. The typical value of linear gain for 110-125GHz is 7dB, and the typical value of reverse isolation is 30dB.

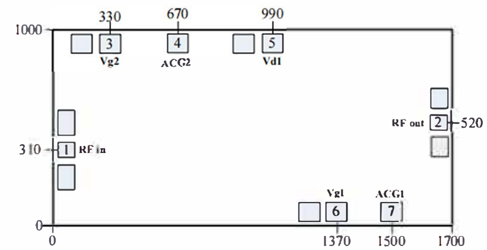
Electrical performance table(Vd=4.5V, Id=48mA, T_A=+25°C)

Parameter	Typ				Unit
Frequency Range	DC-70	70-90	90-110	110-125	GHz
Linear Gain	10	12	10	7	dB
Reverse Isolation	35	35	30	30	dB
Noise Coefficient	4		5		dB
PldB	10	7	3	0	dBm
Saturated Power	12	10	7	3	dBm
Input Standing Wave	2				-
Output VSWR	2				-
Saturation Current	60				mA

Use Restriction Parameters

Negative Gate Voltage	-1V
Positive Drain Voltage	5V
Input Power	10dBm
Storage Temperature	-65℃~150℃
Usage Temperature	-55℃~85℃

External Dimensions



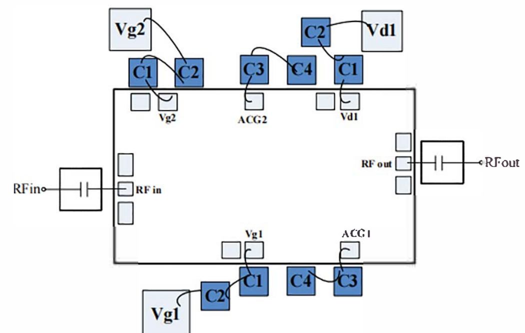
Notes:

1) All dimensions marked are in micrometers (μm);
2) Dimensional tolerance for external dimensions: ±50μm;
3) The chip thickness is 70μm.

Definition Of Bonding Pressure Point

Number	Symbol	Function Description	Size(μm²)
1	RFin	RF signal input terminal, connected to an external 50 ohm system, requires the addition of Bias Tee or DC blocking capacitor	80×80
2	RFout	RF signal output terminal, connected to an external 50 ohm system, requires the addition of BiasTree or DC blocking capacitor	80×80
3、 6	Vg2 、 Vg1	Gate voltage feeding terminal requires external 100pF and 0.01uF bypass capacitors	100×100
4、 7	ACG2、 ACG1	Low frequency terminal requires external 1000pF and 0.47uf bypass capacitors	100×100
5	Vd1	The drain voltage feeding terminal requires an external 100pF and 0.01uf bypass capacitor	100×100

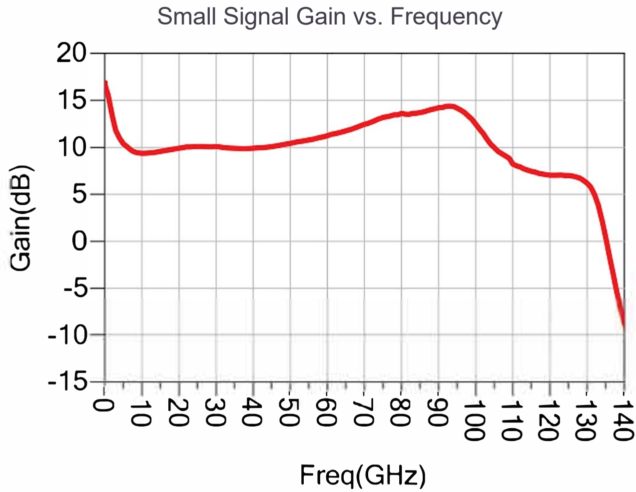
Suggested Assembly Diagram

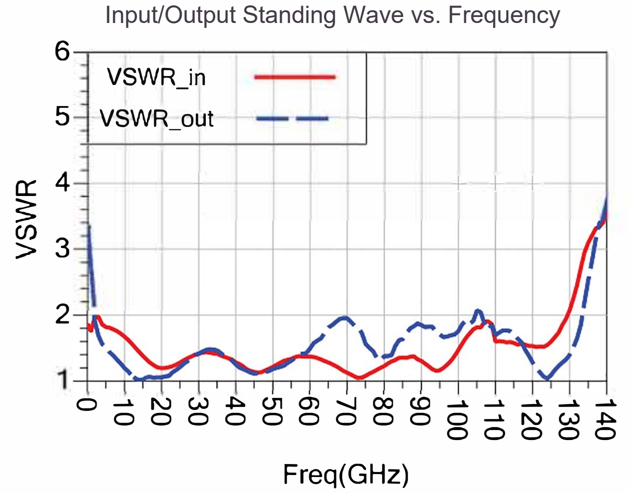


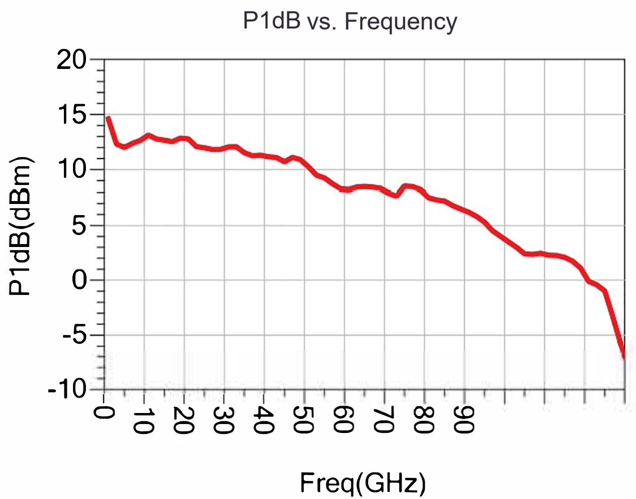
Notes：

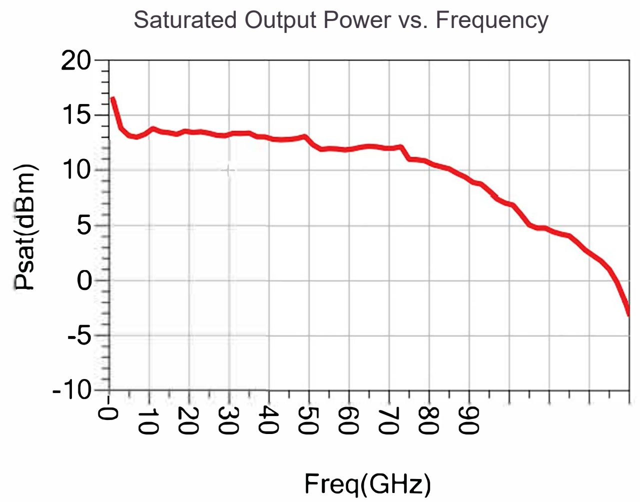
1) The capacitance of the peripheral capacitor C1 is 100pF, the capacitance of C2 is 0.01 μF, the capacitance of C3 is 1000pF, and the capacitance of C4 is 0.47μF. Among them, it is recommended to use a single-layer capacitor for C1 and try to be as close as possible to the chip bonding point. Suggest adding a 10 μF bypass capacitor to Vg and Vd.

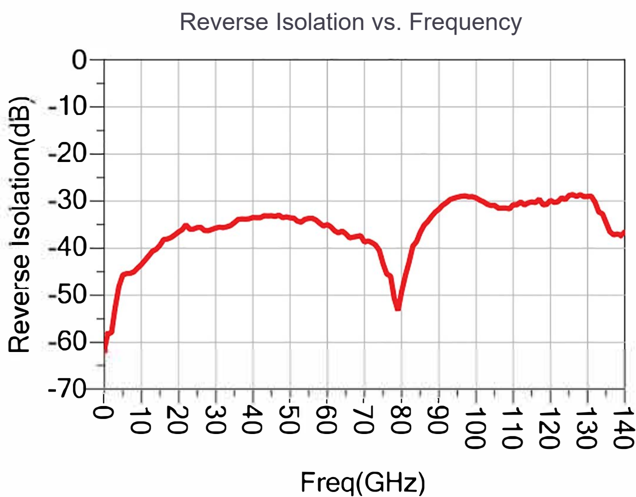
Continuous Wave Test Curve In Film

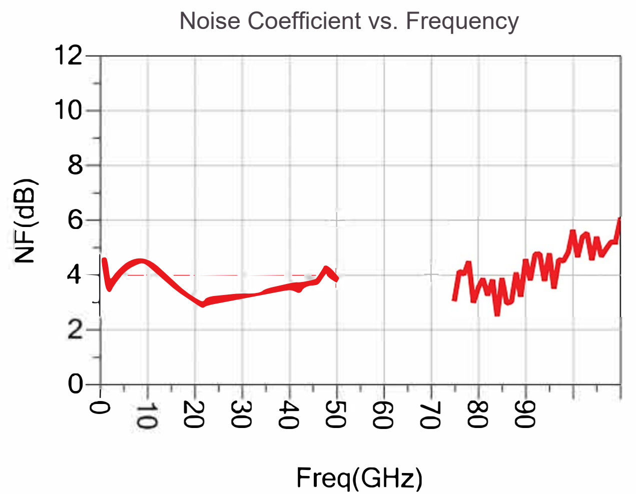












Note:

1) Storage: The chip must be placed in a container with electrostatic protection and stored in a nitrogen environment.

2) Cleaning treatment: Bare chips must be operated and used in a purified environment, and it is prohibited to use liquid cleaning agents to clean the chips.

3) Electrostatic protection: Please strictly comply with ESD protection requirements to avoid electrostatic damage.

4) Conventional operation: To retrieve the chip, please use a vacuum chuck or a precision pointed camera. During the operation, avoid touching the chip surface with tools or fingers.

5) Power on sequence: When powering on, apply gate voltage first, then drain voltage; When powering off, first remove the leakage voltage, then remove the gate voltage.

6) Mounting operation: Chip installation can use AuSn solder eutectic sintering or conductive adhesive bonding process. The mounting surface must be clean and flat, and the gap between the chip and the input/output RF connection substrate should be minimized as much as possible.
Sintering process: Use 80/20 AuSn for sintering, with a sintering temperature not exceeding 300 °C, a sintering time as short as possible, not exceeding 20 seconds, and a friction time not exceeding 3 seconds.
Adhesive process: When bonding conductive adhesive, try to minimize the amount of glue applied, and refer to the information provided by the conductive adhesive manufacturer for curing conditions.

7) Bonding operation:
Unless otherwise specified, use 2 bonding wires (25 μ m diameter gold wire) for RF input and output, and keep the bonding wires as short as possible.
Hot ultrasonic bonding temperature is 150 °C, using the smallest possible ultrasonic energy.

8) Please contact the supplier if you have any questions.