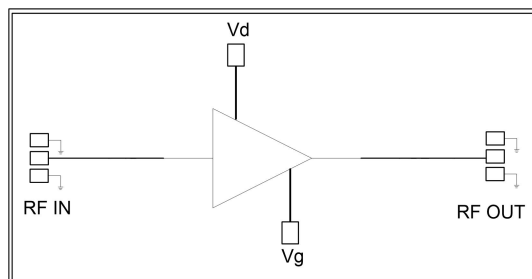


GaAs MMIC Power Amplifier Chip, 0.1-20GHz

Performance characteristics

Frequency range: 0.1 -20GHz
 Small signal gain: 12dB
 Gain flatness: $\leq \pm 0.5\text{dB}@ 1 -20\text{GHz}$
 P- 1dB: 30dBm
 Psat: 31dBm
 Power supply: + 10V (+11V) /320mA
 50Ohm input / output
 Chip size: 2.23X1.35X0.1mm

Functional Block Diagram



Product Introduction

GPA-0120-30 is an ultra-wideband distributed amplifier chip based on pHEMT technology, with a frequency range of 0.1GHz~20GHz, a small signal gain of 12dB, and a saturated output power of 30dBm. GPA-0120-30 is currently the only GaAs monolithic chip in China with an output power greater than 1W in the full frequency band of 0.1-20GHz, and has excellent gain flatness. The chip through-hole metallization process ensures good grounding, and the back side is metallized, which is suitable for eutectic sintering or conductive adhesive bonding process.

Use restriction parameter ¹

Maximum drain voltage	+14V
Maximum gate bias	-3V
Maximum input power	+23dBm
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=+10V, *Ids=320mA)

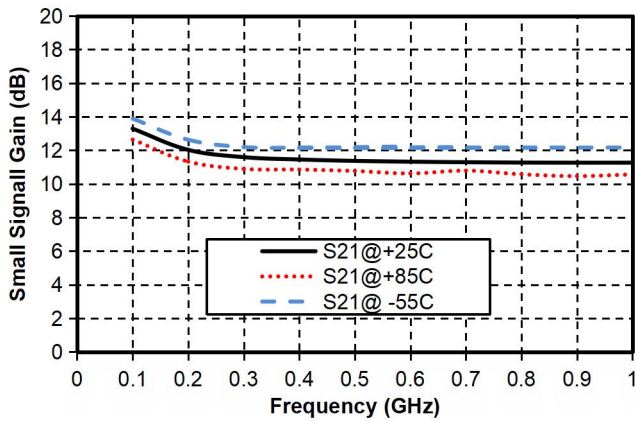
Index	Minimum	Typical Value	Maximum	Minimum	Typical Value	Maximum	Minimum	Typical Value	Maximum	Unit
Frequency Range	0.1-1			1-18			18-20			G Hz
Small Signal Gain	-	11.5	-	-	12	-	-	13	-	dB
Gain Flatness	-	± 1.0	-	-	± 0.3	-	-	± 0.3	-	dB
P-1	28	29.5	30	29.0	30	30.5	28.5	29	29.5	dBm
Psat	-	30	-	-	31	-	-	30	-	dBm
OIP3	-	35	-	-	37	-	-	36	-	dBm

Input return loss	-	15	-	-	15	-	-	13	-	dB
Output return loss	-	17	-	-	20	-	-	15	-	dB
* By adjusting the Vg terminal voltage -2V~0V , 320mA can be achieved .										

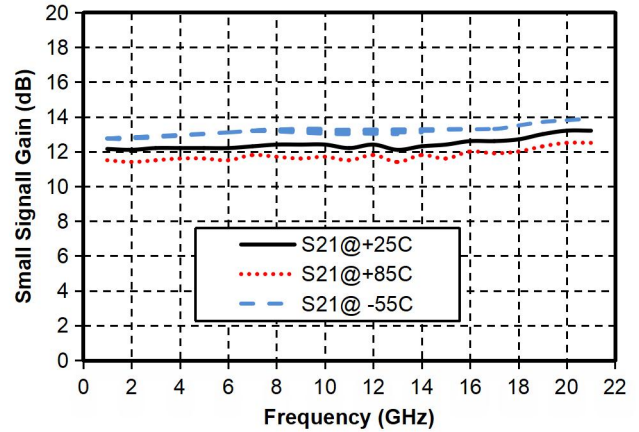
GaAs MMIC Power Amplifier Chip, 0.1-20GHz

Main index test curve

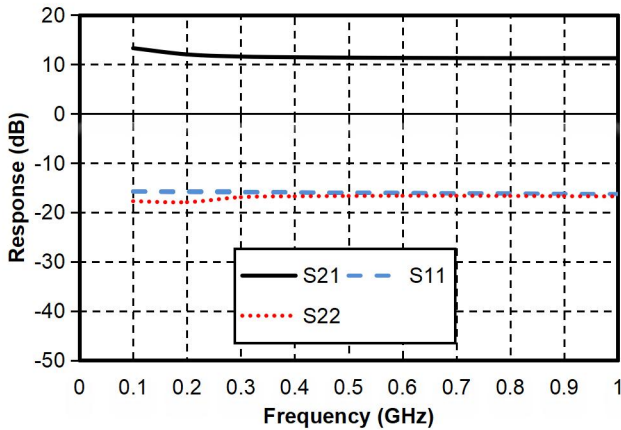
Gain vs. Temperature (0.1~1GHz)



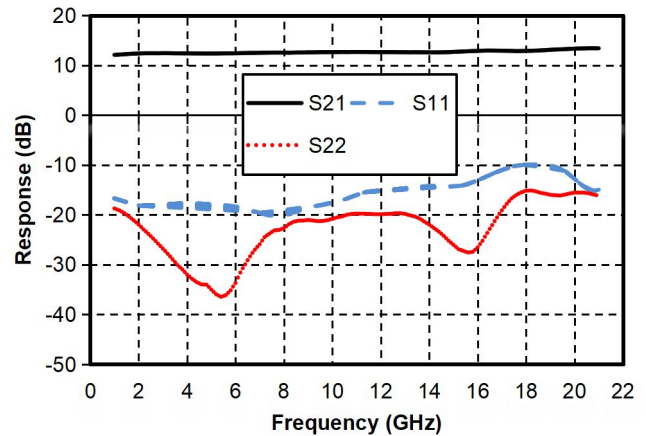
Gain vs. Temperature (1~20GHz)



Gain & Input/Output Return Loss vs. Frequency (0.1~1GHz)

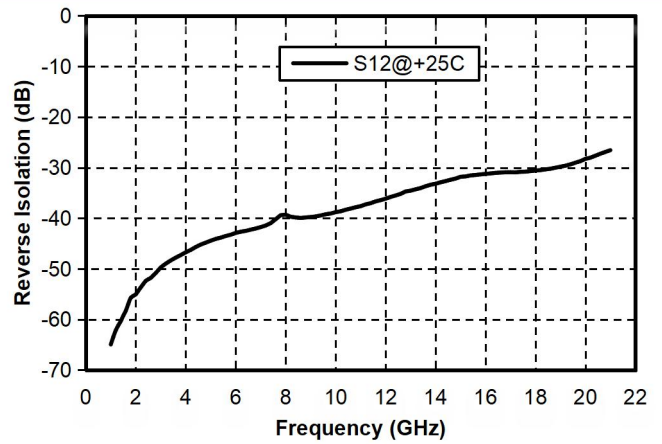
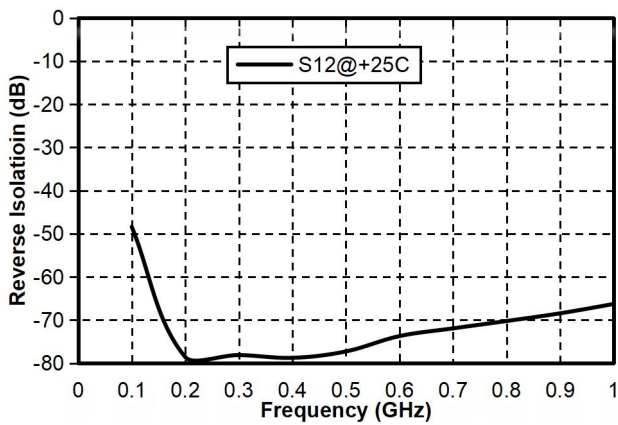


Gain & Input/Output Return Loss vs. Frequency (1~20GHz)



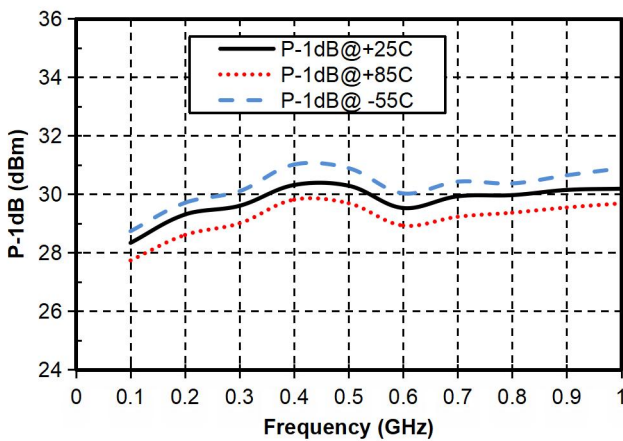
Reverse Isolation vs. Frequency (0.1~1GHz)

Reverse Isolation vs. Frequency (1~20GHz)

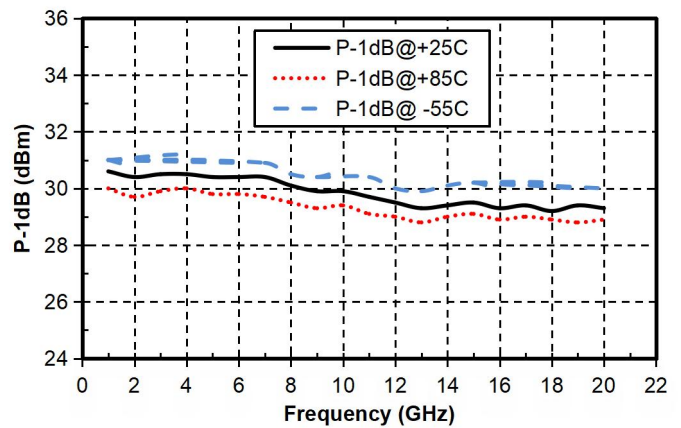


GaAs MMIC Power Amplifier Chip, 0.1-20GHz

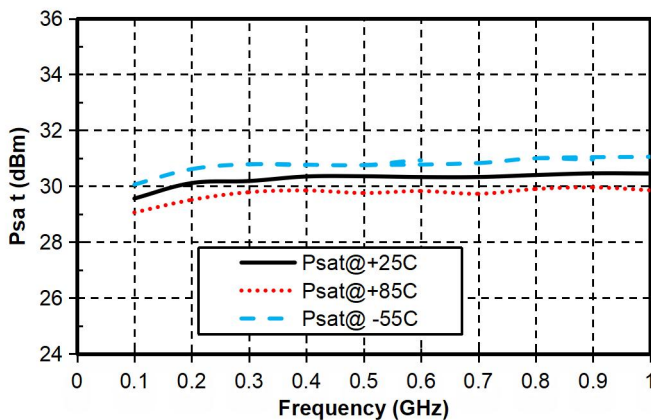
P-1dB vs. Frequency (0.1-1GHz)



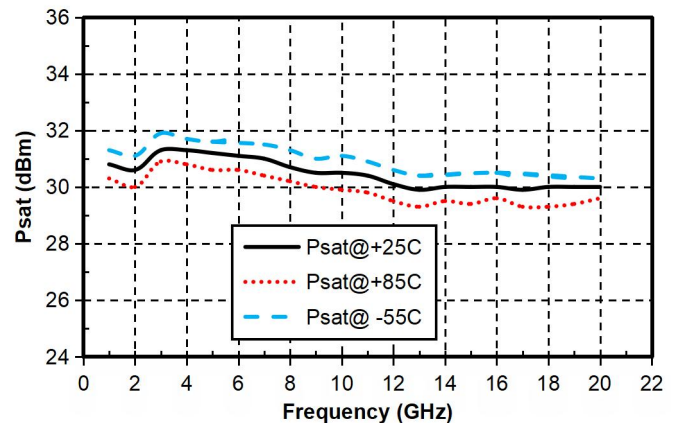
P-1dB vs. Frequency (1-20GHz)



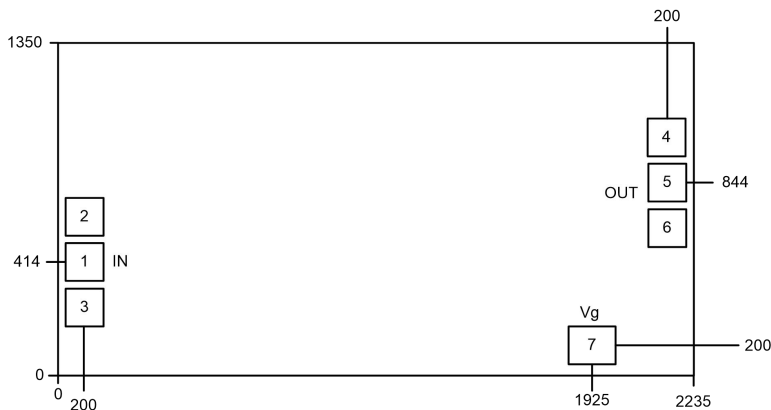
P sat vs. frequency (0.1-1GHz)



P sat vs. frequency (1-20GHz)



Appearance structure ²



【2】 All units in the figure are micrometers.

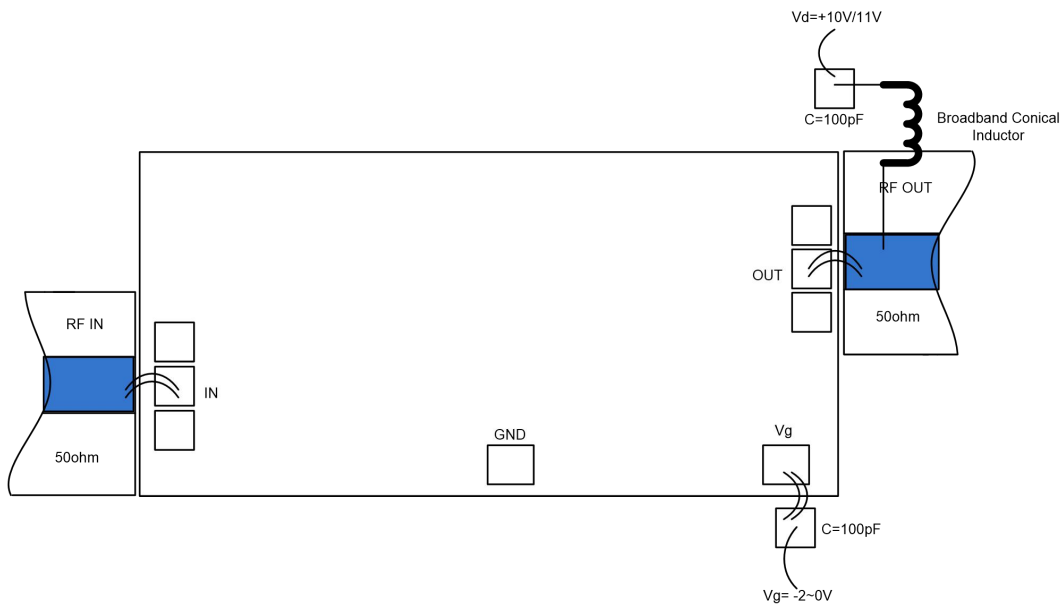
GaAs MMIC power amplifier chip, 0.1-20GHz

Bonding point definition		
Bonding point number	Function Symbol	Functional Description
1	RFIN	The signal input terminal is connected to a 50 ohm circuit, and a DC blocking capacitor needs to be added
5	RF OUT	The signal output terminal is connected to a 50 ohm circuit, and a DC blocking capacitor and an external DC bias network are required to provide drain current. Please refer to the following application circuit or contact the manufacturer
7	Vg	It is recommended to bond the bypass capacitor to the gate pad according to the following application circuit.
8	Vd	Amplifier drain bias, requires external 100pF bypass capacitor
2, 3, 4, 6, chip bottom	GND	The bottom of the chip needs to be in good contact with the RF and DC grounds

Application circuit structure

* A broadband bias network (broadband conical inductor + broadband capacitor) that can withstand 700mA needs to be soldered to the RF OUT end. Recommended broadband conical inductor model : CC19T40K240G5-C, recommended broadband capacitor model: 550L104KT .

Recommended assembly drawing



- The conical end pin of the conical spiral inductor should be as close to the chip output port as possible.