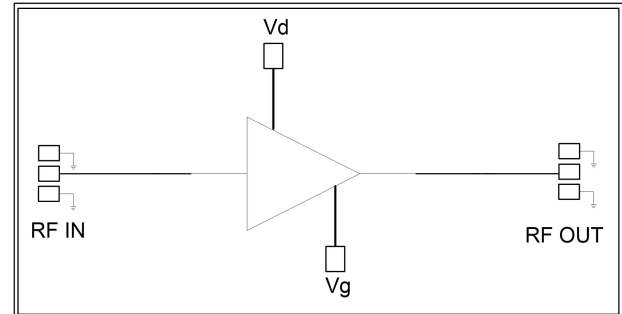


AGC Power Amplifier, DC-40GHz

Features:

Freq. Range: DC-40GHz
 Gain: 12dB
 NF: 5dB
 Psat: 22dBm
 Supply: +7V/160mA
 50Ohm Input/Output
 100% On Wafer Test
 Size: 2.5 X1.2 X0.1mm

Functional Diagram:



Product Introduction:

IPA-0040-22 is an ultra-wideband distributed amplifier based on pHEMT technology, with a frequency range of DC~40GHz, a gain of 12dB, and a saturated output power of 22dBm. IPA-0040-22 can realize automatic gain control by tuning the VC control terminal voltage. The chip via metallization process ensures good grounding, and the back side is metallized, which is suitable for eutectic sintering or conductive adhesive bonding process.

Absolute Maximum Ratings¹

Maximum Vdd	+9V
Maximum Gate Bias	-2V
Maximum Input Power	+18dBm
Working Temperature	-55 ~ +85°C
Storage Temperature	-65 ~ +150°C
【1】 Exceeding any of the above maximum limits may cause permanent damage.	

Electrical Specifications($T_A = +25^\circ\text{C}$, $V_d = +7\text{V}$)

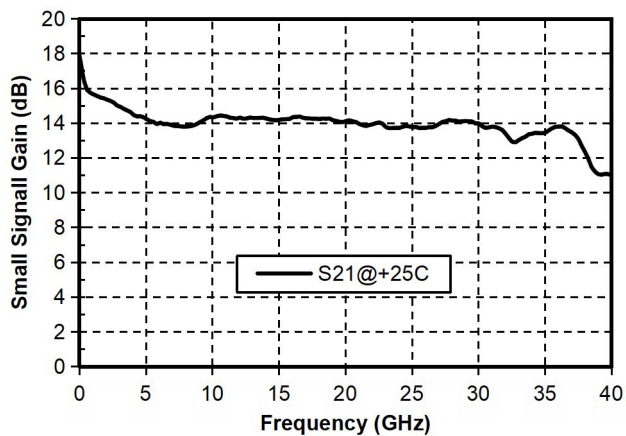
Parameter	Min.	Typ.	Max.	Units
Freq. Range	DC-40			GHz
Gain		12		dB
NF		5		dB
P-1dB*(Negative pressure conditions)		20		dBm
Psat*(Negative pressure conditions)		22		dBm
Input Return Loss		15		dB
Output Return Loss		15		dB
Current		160		mA

*By tuning the Vg terminal voltage from -2V to 0V, reaching 160mA, the Vg terminal voltage is expected to be -0.25V; the Vg terminal can be suspended, and the current is 185mA when suspended.

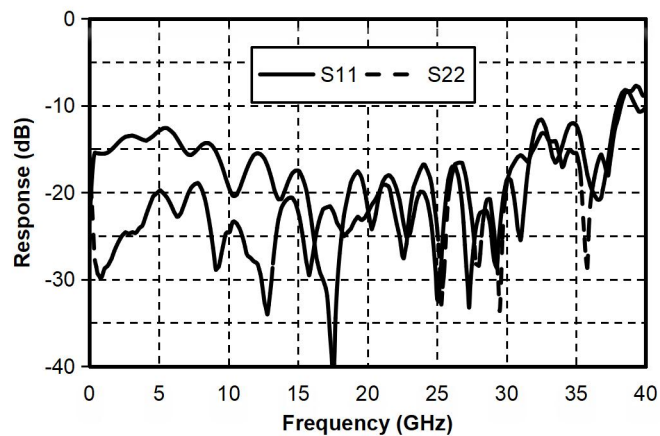
GaAs MMIC Power Amplifier, DC-40GHz

Test Curve@+7V, 160mA

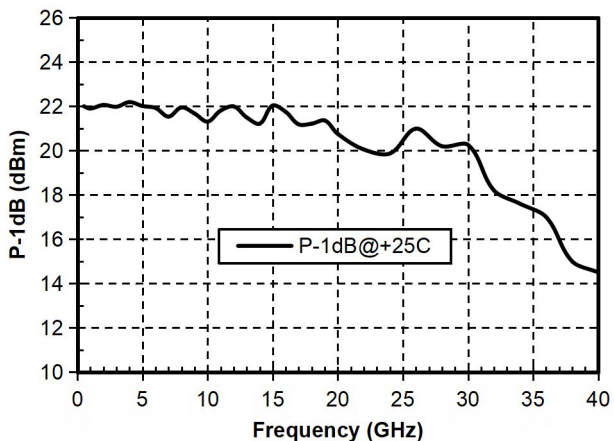
Gain vs. Freq.



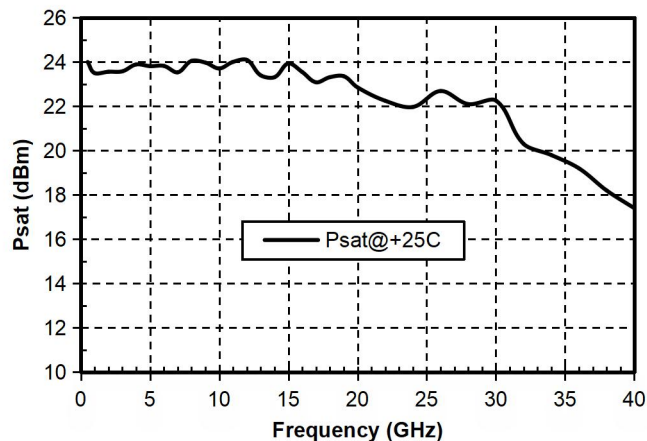
Input/Output Return Loss



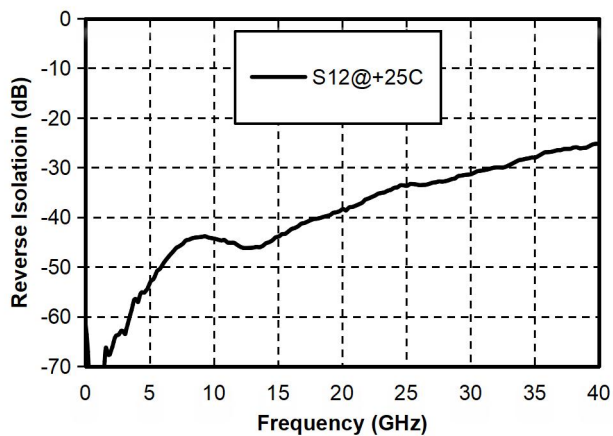
P-1dB vs. Freq.



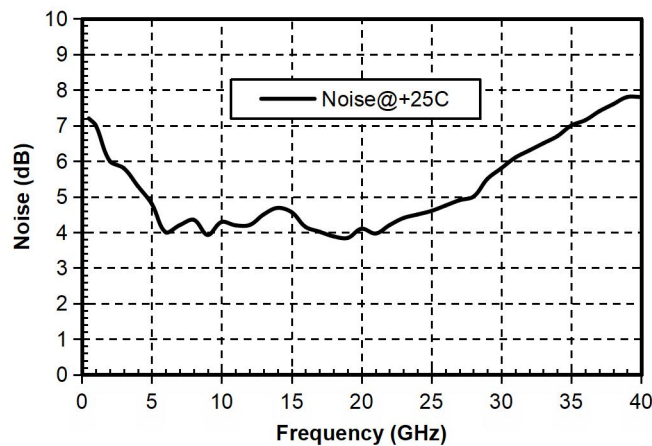
Psat vs. Freq.



Reverse Isolation vs. Freq.

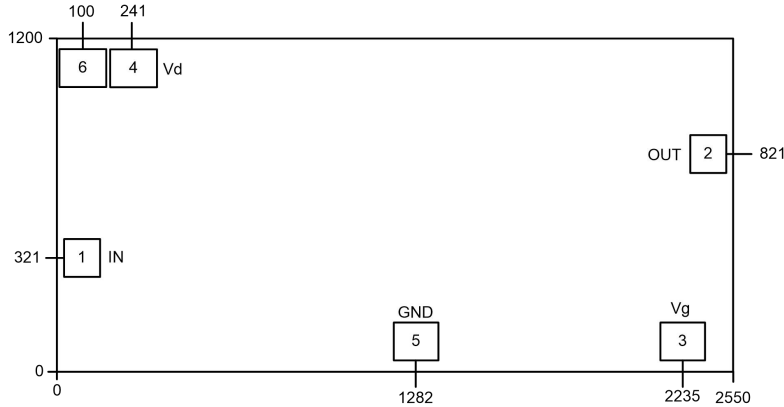


NF vs. Freq.

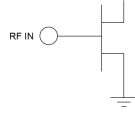
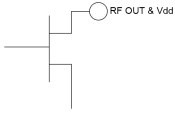
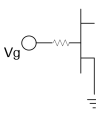






GaAs MMIC Power Amplifier, DC-40GHz

Outline Drawing²

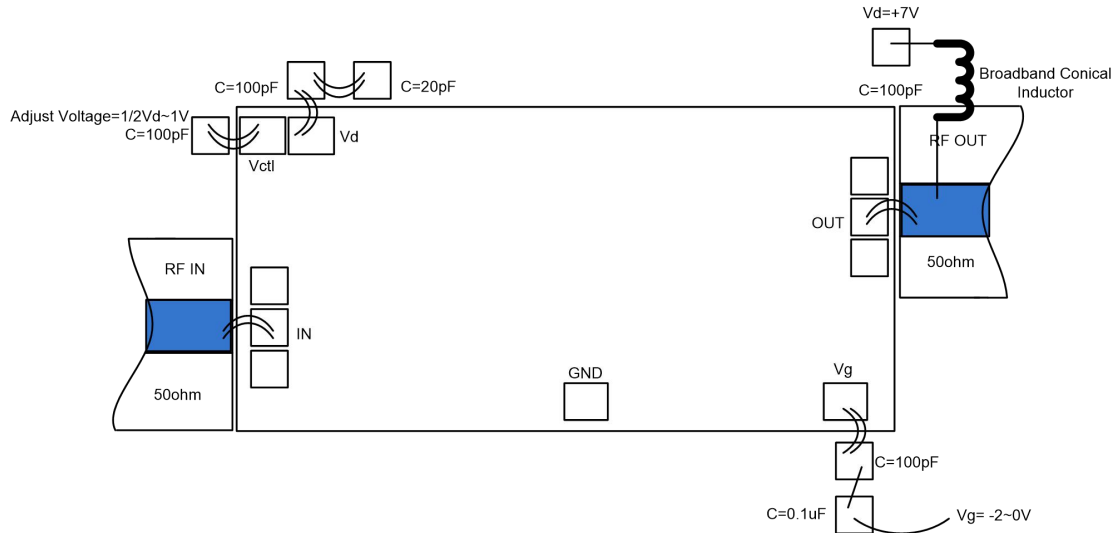


【2】 The units in the figure are all microns.

Pad Descriptions			
Pad Number	Function Symbol	Description	Equivalent Circuit
1	RFIN	RF signal input terminal, DC blocking capacitor is required.	
2	RFOUT	RF signal output terminal, DC blocking capacitor is required.	
3	Vg	Amplifier gate bias voltage, an external 100pF bypass capacitor is required	
4	Vd	Amplifier drain bias, an external bypass capacitor of 100pF is required	
5	GND	Ground pressure point for probe test	
6	Vctl	The gain control terminal of the amplifier requires an external 100pF bypass capacitor	
Bottom of the chip	GND	Bottom of the chip needs to be well grounded with RF and DC	

GaAs MMIC Power Amplifier, DC-40GHz

Recommended assembly drawing



Note:

1. VD end to ground.
2. The power-on position is located at the RF output port of the chip, powered by a broadband tapered inductor.
3. The gain control terminal (Vctl) adjusts the voltage from 1/2 chip Supply voltage to +1V, which can achieve chip (1V) 0dB~(3.5V) 12dB gain output tuning.
4. +6V power supply chip can also work. When working at +6V, the output gain is increased by 2~3dB, and the output power is reduced by 2~3dB.