# GPA-0030E

## GaAs MMIC Power Amplifier Chip, DC-30GHz

### Performance characteristics

Frequency range: DC-30 GHz
Small signal gain: 14dB (positive slope)
Gain flatness: ±1.6dB
P-1dB: 28.0 dBm
Psat ： 28.5 dBm
Power supply: +10V@350mA
100% on-chip testing
Chip size: 2.8 x 1.56 x 0.1mm

### Product Introduction

GPA -0030E is a broadband amplifier chip based on GaAs process, with a frequency range covering DC-30 GHz, a small signal gain of 14 dB, and a Psat output power of 28.5 dBm. The chip's through-hole metallization process ensures good grounding, and the back side is metallized for eutectic sintering. The chip also supports + 9V, +11V, and +12V operation.

| Use restriction parameter [1] | |
|---|---|
| Maximum drain voltage | +15 V |
| Maximum gate bias | - 3V |
| 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 = +10 V , Ids= 350 mA) | | | | |
|---|---|---|---|---|
| Index | Minimum | Typical Value | Maximum | Unit |
| Frequency Range | | DC-30 | | GHz |
| Small Signal Gain | - | 14 | - | dB |
| Gain Flatness | - | ± 1.6 | - | dB |
| Noise Figure | - | 4.2 | - | dB |
| P-1dB | - | 28.0 | - | dBm |
| Psat | - | 28.5 | - | dBm |
| OIP3(Pout/tone=+16dBm) | - | 34 | - | dBm |
| Second Harmonic | - | 33 | - | dBc |
| Third harmonic | - | 52 | - | dBc |
| Input return loss | - | 16 | - | dB |
| Output return loss | - | 21 | - | dB |
| *By tuning the Vg terminal voltage from -2V to 0V, the recommended Vg terminal voltage is -0.65V . | | | | |

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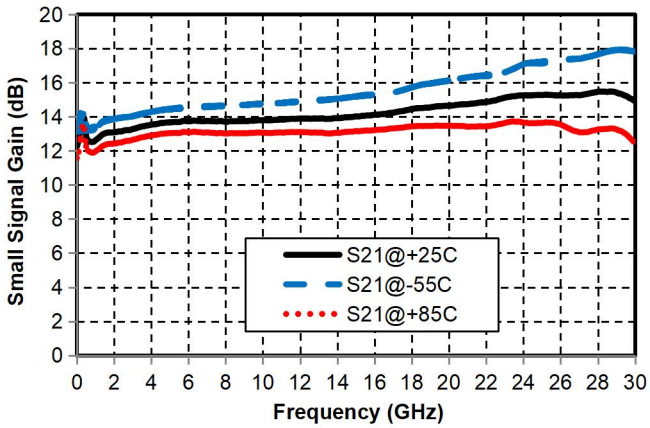
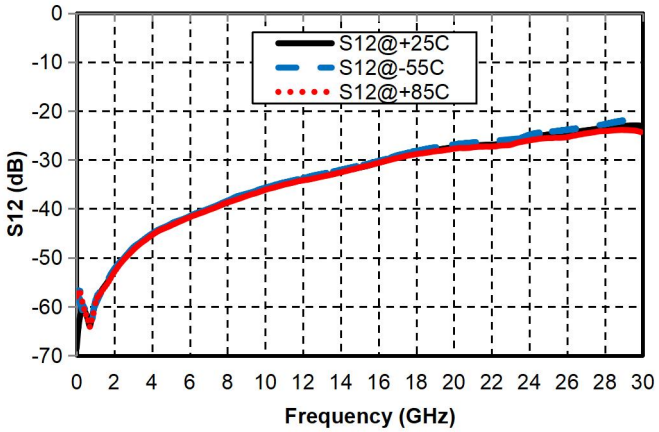
## GaAs MMIC Power Amplifier Chip, DC-30GHz

### Main index test curve

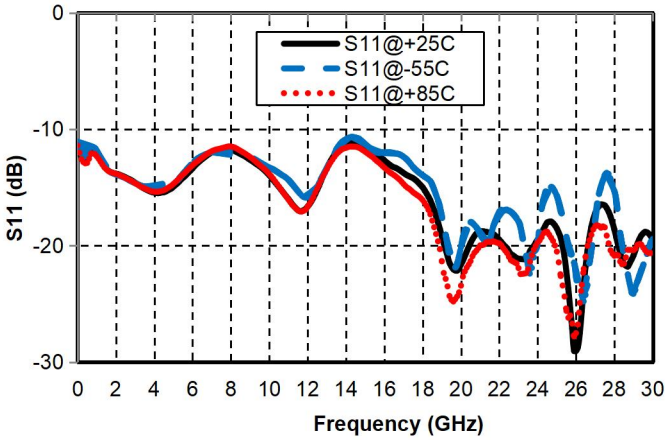
Gain vs. Temperature



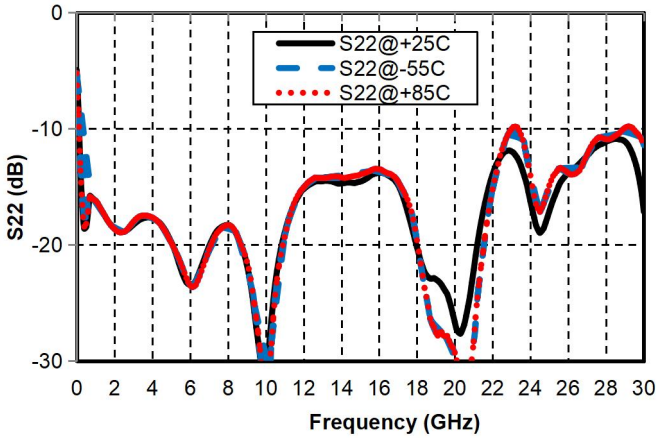

Reverse Isolation vs. Temperature



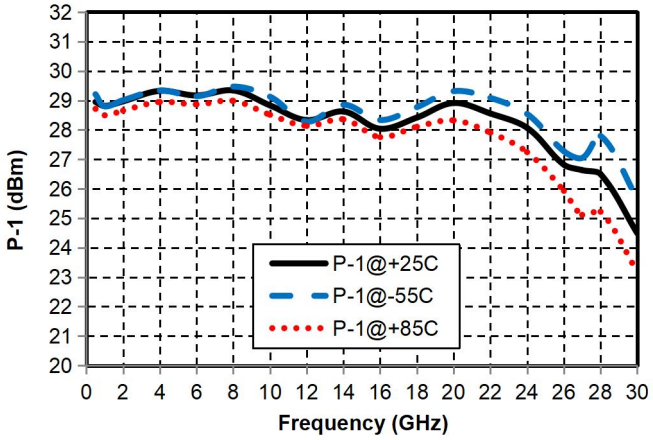

Input Return Loss vs. Temperature



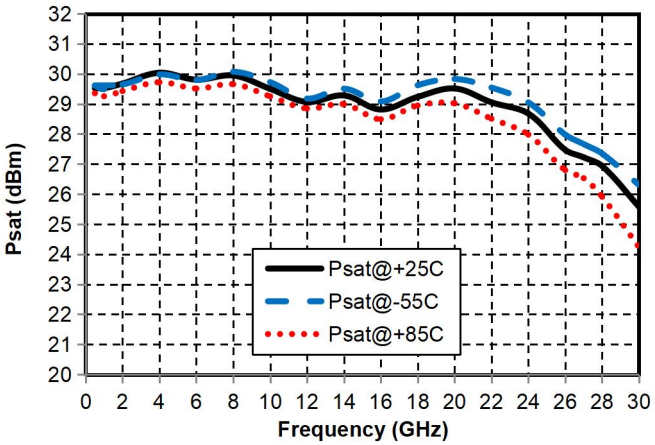

Output Return Loss vs. Temperature




P -1 vs. Temperature



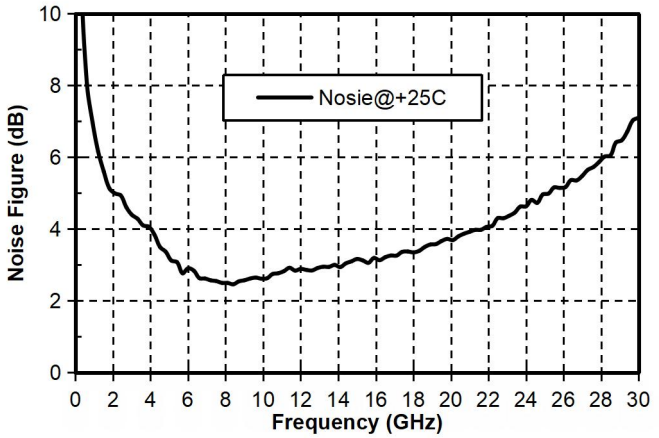

P sat vs. temperature



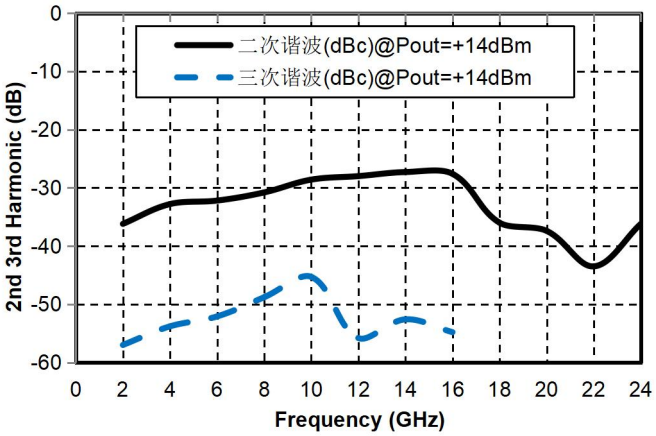
## GaAs MMIC Power Amplifier Chip, DC-30GHz

### Main index test curve

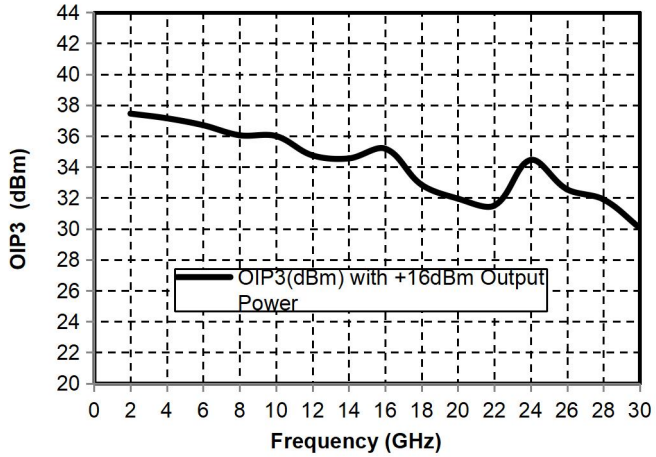
Noise Figure vs. Frequency



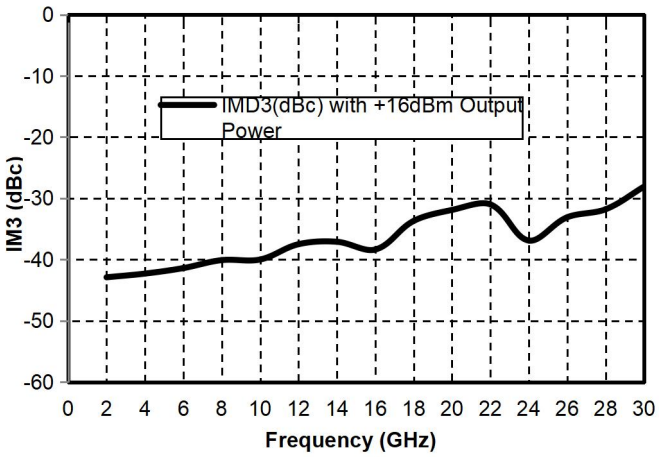

Second Harmonic, Third Harmonic vs. Frequency



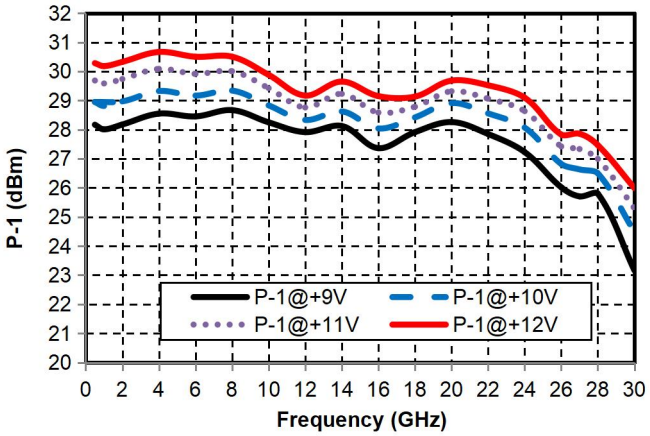

OIP3 vs. Frequency



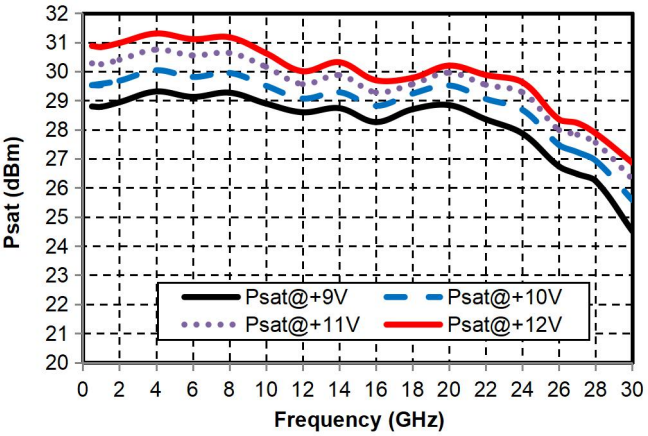

IMD3 vs. Frequency




P -1 vs. Voltage




P sat vs. voltage

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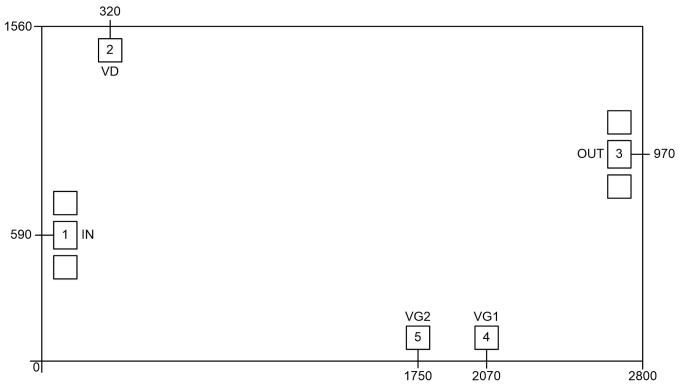
## GaAs MMIC Power Amplifier Chip, DC-30GHz

### Appearance structure [2]




【 2 】The units in the figure are all micrometers (dimensional tolerance: ± 50um .)

| 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 a DC blocking capacitor needs to be added |
| 3 | RF OUT 、VD | The signal output terminal is connected to a 50 ohm circuit, and a DC blocking capacitor needs to be added . An external DC bias network is connected to provide drain current . Please refer to the following application circuit or contact the manufacturer. |
| 2 | VD | Need to connect external 100pF , 4.7uF bypass capacitor to ground |
| 4 | VG1 | Amplifier gate bias , external 100pF , 4.7uF bypass capacitors are required |
| 5 | VG2 | 0.01uF bypass capacitor is required to ground |
| Chip bottom | GND | needs to be in good contact with the RF and DC grounds |

## Recommended assembly dragram