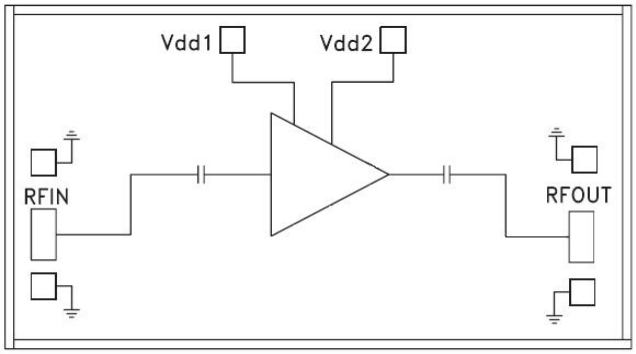
# GPA-0620C-23

## GaAs MMIC Power Amplifier Chip, 6-20GHz

### Performance characteristics

Frequency range: 6-20GHz
Small Signal Gain: 14.5 dB
Gain flatness: ± 0.5 dB
P-1dB: 19.5 dBm
Psat: 20.5 dBm
Power supply: +5 V/ 110 mA
50Ohm input/output
100% on-chip testing
Chip size : 1.05 x 1.025 x 0.1mm

### Functional Block Diagram




### Product Introduction

GPA-0620C is a broadband amplifier chip based on GaAs technology, covering a frequency range of 6~20GHz, a small signal gain of 14.5dB, and a P-1 output power of 19.5dBm. The chip is powered by a single +5V power supply. 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 | +7 V |
| Maximum input power | +20dBm |
| Operating temperature | -55 ~ + 85 °C |
| Storage temperature | -65 ~ +150°C |

【1】 Exceeding any of these maximum limits may cause permanent damage.

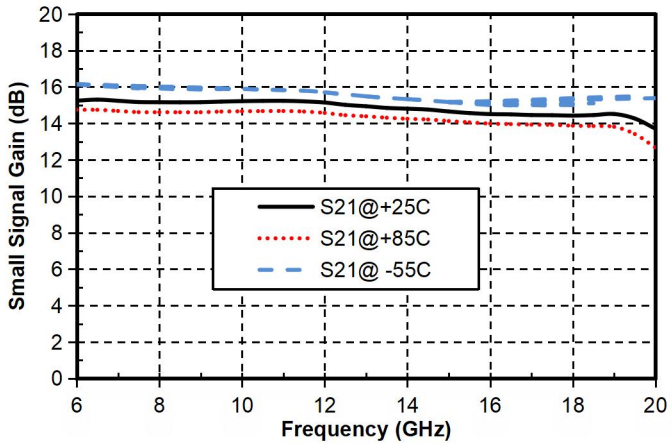
| Electrical performance parameters ( TA = +25°C , Vd = +5V ) | | | | |
|---|---|---|---|---|
| index | Minimum | Typical Value | Maximum | unit |
| Frequency Range | | 6-20 | | GHz |
| Small Signal Gain | - | 14.5 | - | dB |
| Gain Flatness | - | ± 0.5 | - | dB |
| P -1 dB | - | 19.5 | - | dBm |
| Psat | - | 20.5 | - | dBm |
| Input return loss | - | 21 | - | dB |
| Output return loss | - | 19 | - | dB |
| Quiescent Current | | 110 | | mA |

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

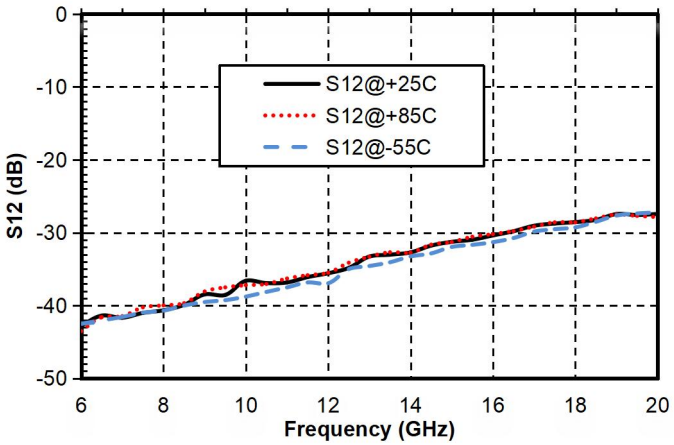
## GaAs MMIC Power Amplifier Chip, 6-20GHz

### Main index test curve

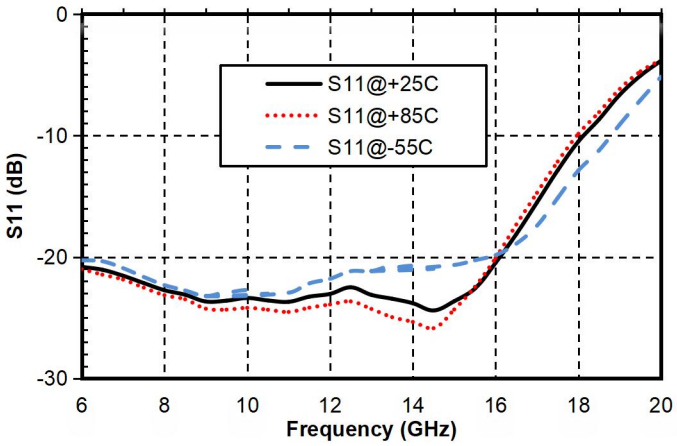
Gain vs. Frequency



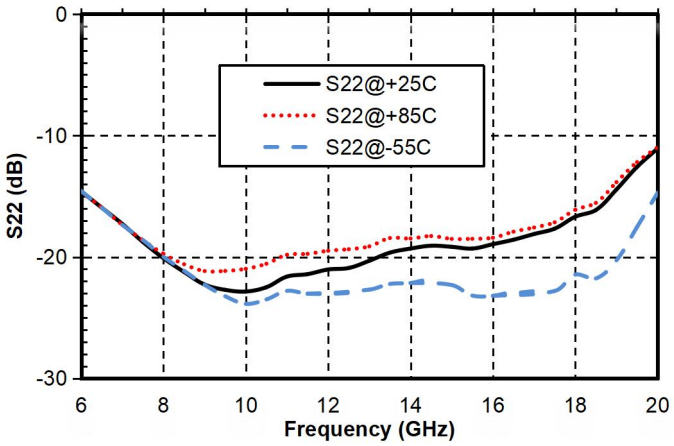

Reverse Isolation vs. Frequency



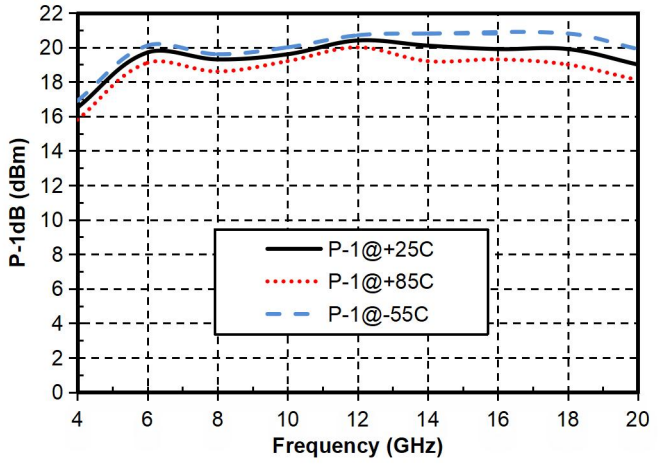

Input Return Loss vs. Frequency



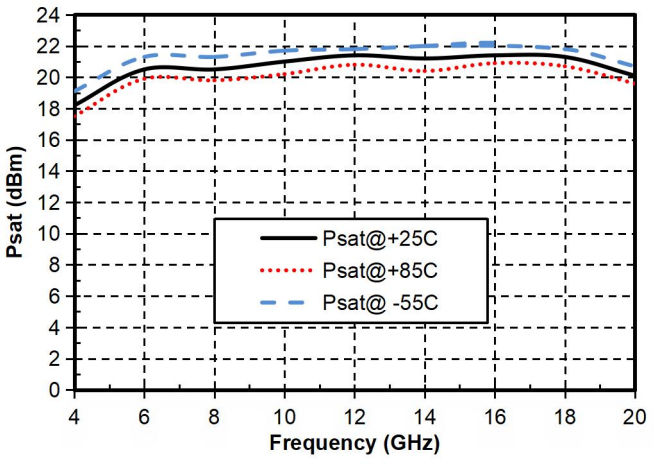

Output Return Loss vs. Frequency




P-1dB vs. Frequency



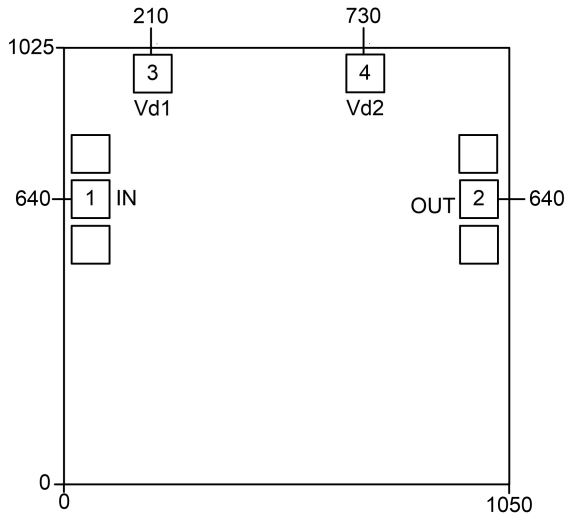

Psat vs. Frequency



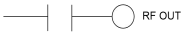

Add: 101 cecil street #14-10, tong eng building singapore 069533
Email: info@standardcircuit.com
Web: www.standardcircuit.com
Tel: +65 82613258

## GaAs MMIC Power Amplifier Chip, 6-20GHz

### Appearance structure [2]

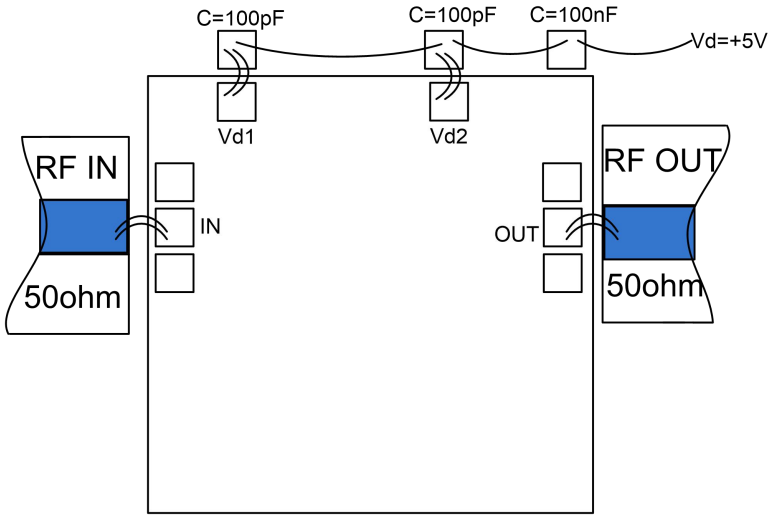



【 2 】All units in the figure are micrometers

| Bonding point definition | | | |
|---|---|---|---|
| Bonding point number | Function Symbol | Functional Description | Equivalent Circuit |
| 1 | RF IN | RF signal input terminal, no DC blocking capacitor required |   |
| 2 | RF OUT | RF signal output terminal, no DC blocking capacitor required |   |
| 3.4 | Vd | Amplifier drain bias, external 100pF, 100nF bypass capacitor required |   |
| Chip bottom | GND | needs to be in good contact with the RF and DC grounds |   |

## GaAs MMIC Power Amplifier Chip, 6-20GHz

### Recommended assembly diagram




### Notice

- The chip must be stored in an anti-static container and kept in a nitrogen environment.
- 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: Bare chip mounting can be done by AuSn solder eutectic sintering or conductive adhesive bonding. 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 process: The amount of conductive glue dispensed should be as small as possible. After the chip is placed in the installation position, the conductive glue can be vaguely seen around it . For curing conditions, please follow the information provided by the conductive glue manufacturer.
- 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).