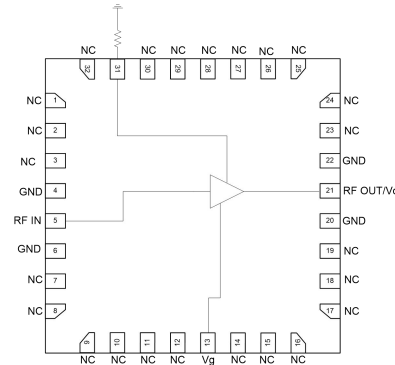


## GaAs MMIC ultra-wideband distributed amplifier chip, 0.1-20 GHz

### Performance characteristics

- Frequency range: 0.1 - 20 GHz
- Small signal gain: 13dB
- Gain flatness:  $\pm 1.4$  dB
- Noise figure: 3.8dB
- P -1dB: 20 dBm
- Psat : 24dBm
- Power supply: +8 V /100mA
- 50Ohm input / output
- Chip size: QFN 5X5

### Block Diagram



### Product Introduction

GPA-0020-23-CQ5 is an ultra-wideband distributed amplifier chip amplifier based on GaAs technology , with a frequency range of 0.1GHz~20GHz, a small signal gain of 13dB, a noise figure of 3.8dB, and a Psat output of 24dBm . IPA-0020-23-CQ5 is powered by a +8V power supply. This chip uses a 5x5mm ceramic surface mount package, and the surface of the pin pad is gold-plated, which is suitable for reflow soldering installation process.

### Use limit parameters

Maximum drain voltage	+14 V
Maximum gate voltage	- 3V
Maximum input power	+20dBm
Operating temperature	-55 ~ +125°C
Storage temperature	-65 ~ +150°C

Exceeding any of these maximum limits may cause permanent damage.

### Electrical performance parameters ( TA = +25°C , Vd = +8V )

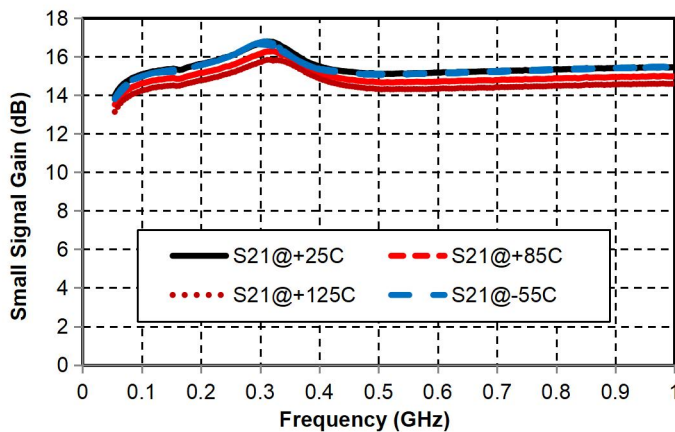
Index	Minimum	Typical Value	Maximum	Unit
Frequency Range	0.1 -20			G Hz
Small Signal Gain	-	13	-	dB
Gain Flatness		$\pm 1.4$		dB
Noise Figure	-	3.8	-	dB
P -1dB	-	20	-	dBm
Psat	-	24	-	dBm
Input return loss	-	15	-	dB
Output return loss	-	15	-	dB
Quiescent Current		100		mA

\* By tuning the Vg terminal voltage from -2V to 0V , 100mA is achieved and the Vg terminal voltage is expected to be -1.1V .

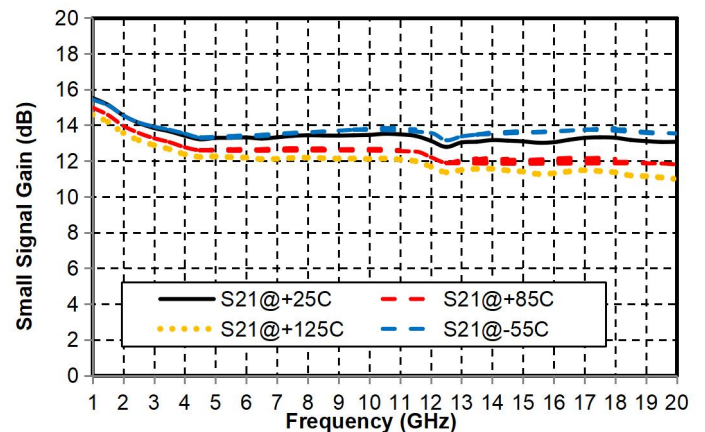
## GaAs MMIC ultra-wideband distributed amplifier chip, 0.1-20 GHz

Main index test curve

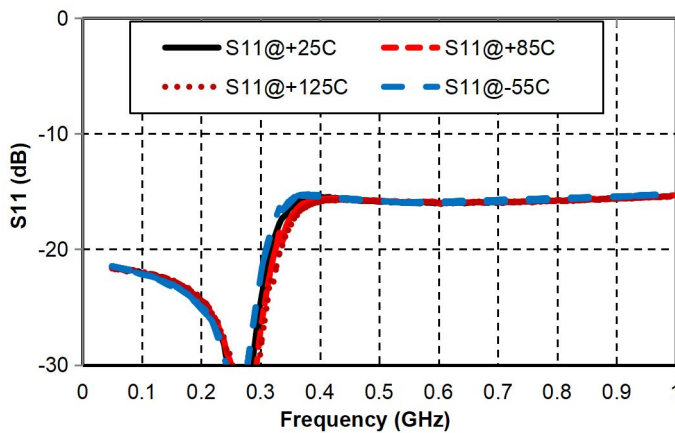
Gain (0.1-1G) vs. Frequency



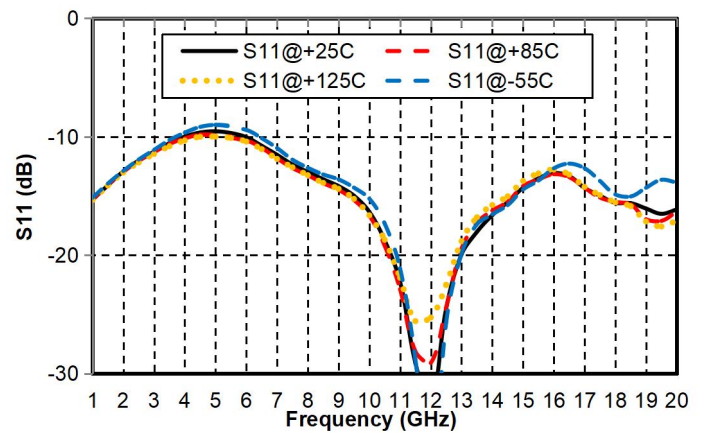
Gain (1-20G) vs. Frequency



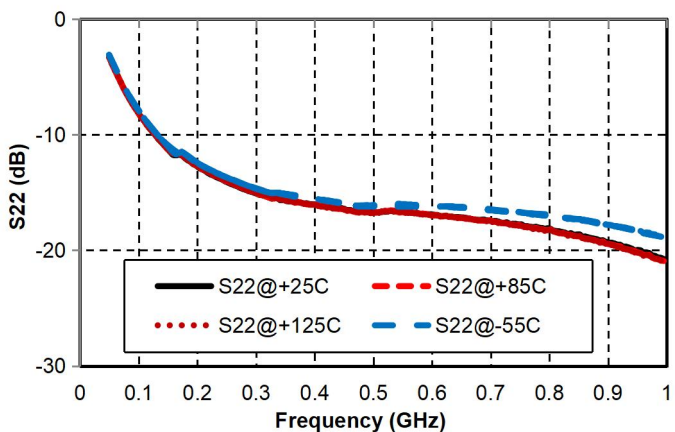
Input Return Loss (0.1-1G) vs. Frequency



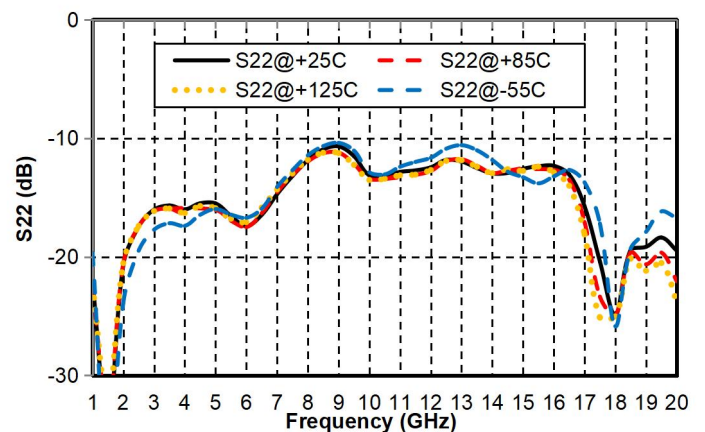
Input Return Loss (1-20G) vs. Frequency



Output Return Loss (0.1-1G) vs. Frequency



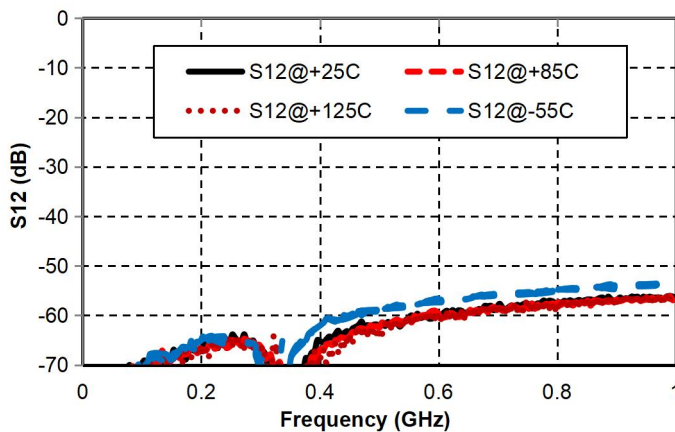
Output Return Loss (1-20G) vs. Frequency



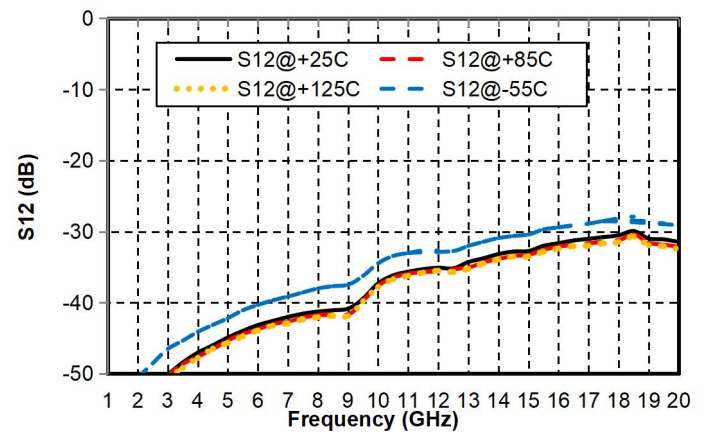
## GaAs MMIC ultra-wideband distributed amplifier chip, 0.1-20 GHz

### Main index test curve

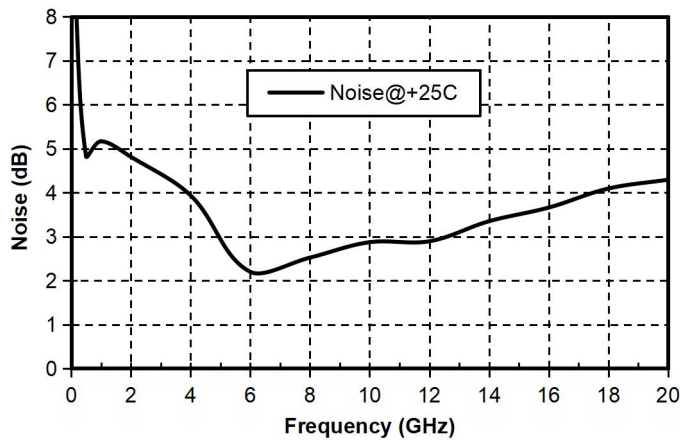
Reverse Isolation (0.1-1G) vs. Frequency



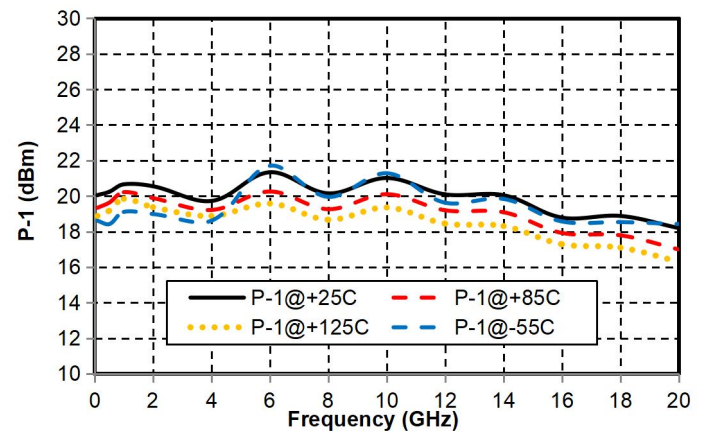
Reverse Isolation (1-20G) vs. Frequency



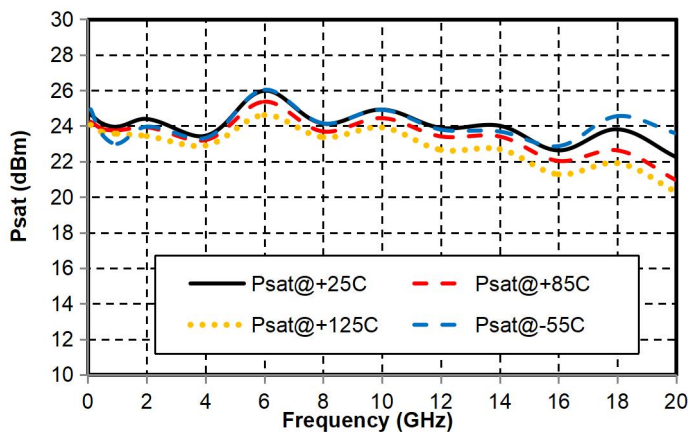
Noise vs. Frequency



P-1 vs. Frequency

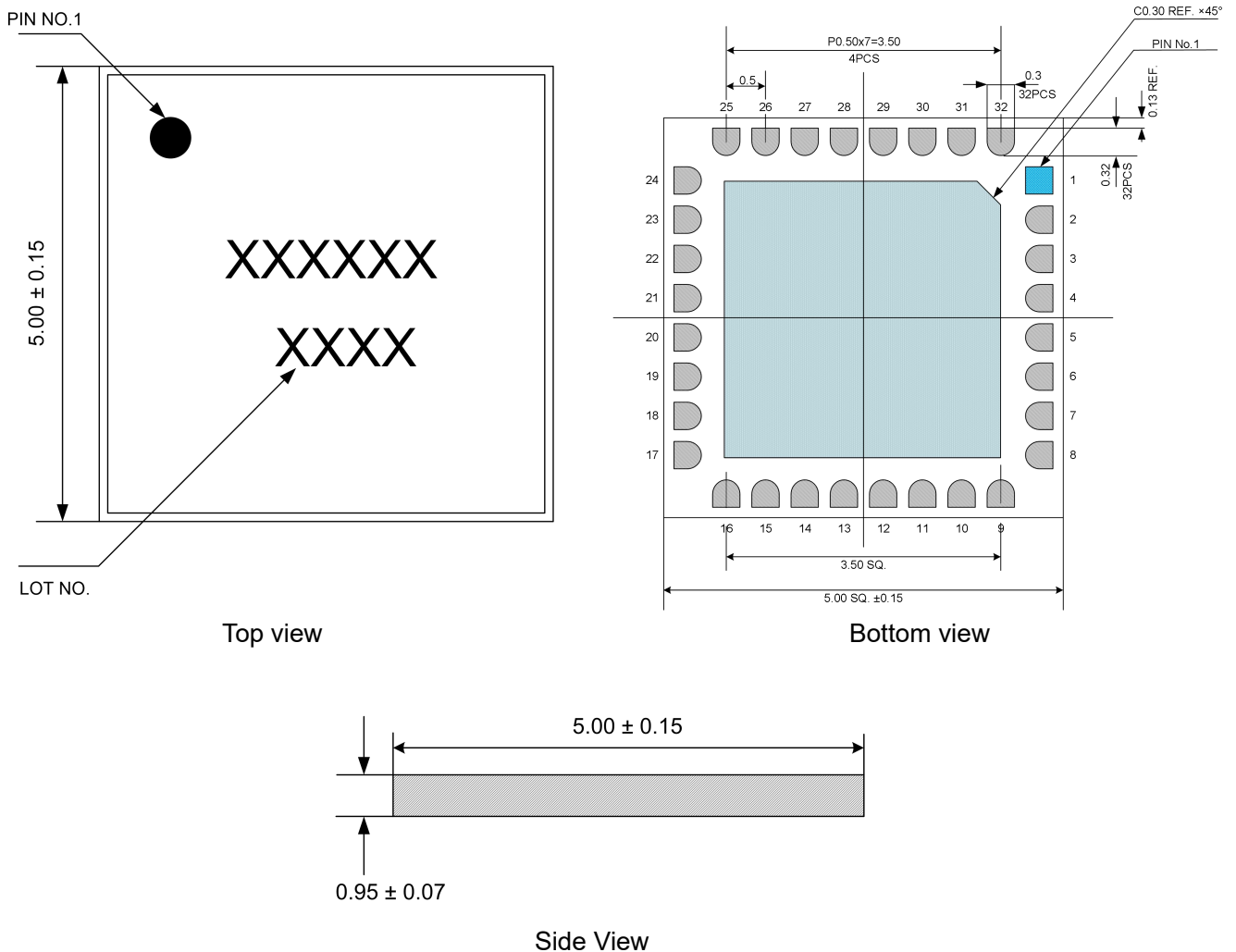


Psat vs. Frequency



## GaAs MMIC ultra-wideband distributed amplifier chip, 0.1-20 GHz

### Appearance structure



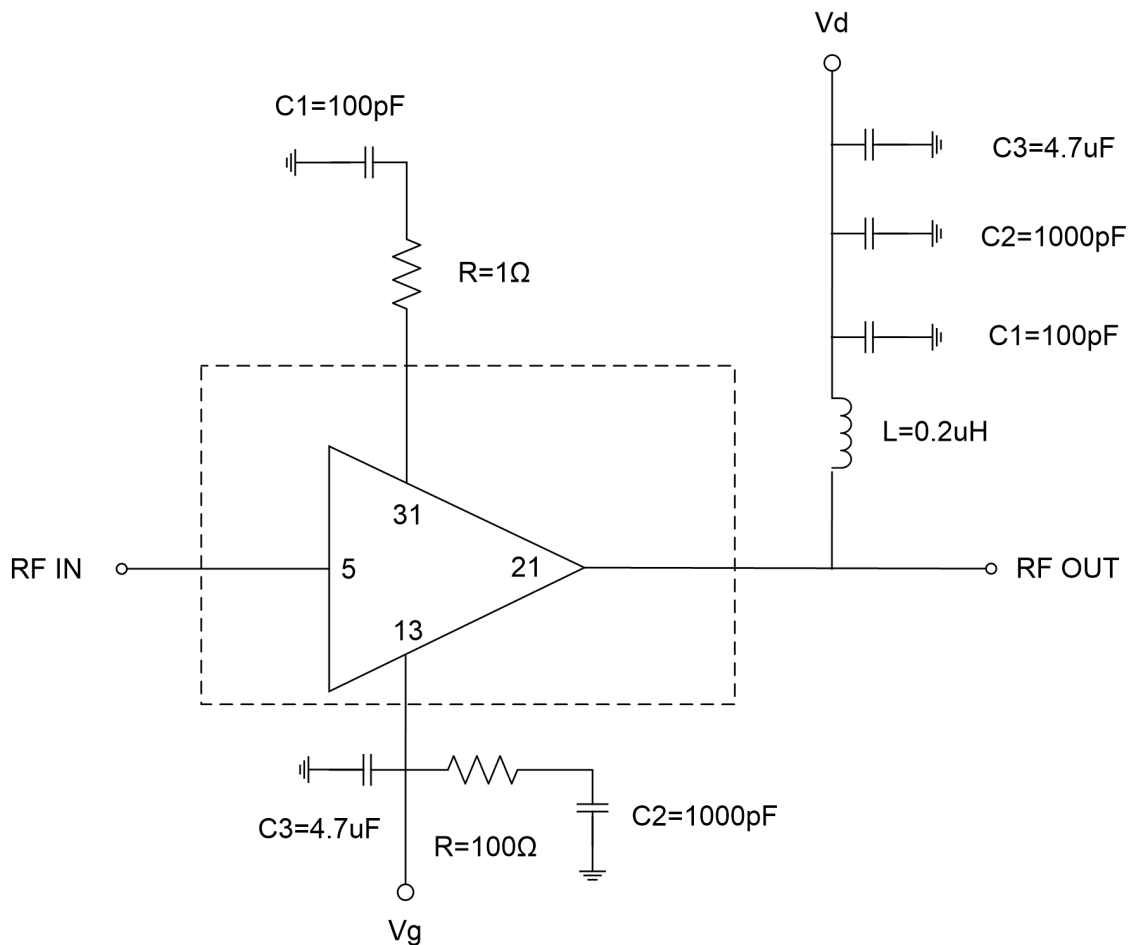
All units in the figure are millimeters

Pin Definition		
Pin Definition	Function Symbol	Functional Description
5	RFIN	RF signal input terminal, requires DC blocking capacitor
21	RFOUT /VDD	At the signal output end , a DC blocking capacitor needs to be added , and an external DC bias network needs to be connected to provide drain current.
13	Vg	Amplifier Gate Bias
3 1	VDD	Low frequency gain absorption
4 , 6 , 20 , 22	GND	Need to be in good contact with the RF and DC grounds.

Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC
Other	NC	No welding required, can be grounded

## GaAs MMIC ultra-wideband distributed amplifier chip, 0.1-20 GHz

### Recommended Circuit



### Precautions for use

- Sealing material : Ceramic material that meets ROHS standards
- Lead surface plating: gold, gold layer thickness greater than 0.3um MIN.
- Maximum reflow peak temperature: 260 °C