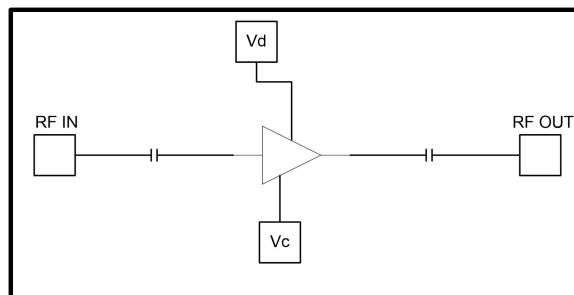


## AGC Low Noise Amplifier Chip, 2-20GHz

### Performance characteristics

- Frequency range: 2-20GHz
- Small signal gain: 16dB
- Noise figure: 2.0dB typ. / 3.5dB max.
- P-1dB: 13dBm
- Power supply: +5V/50mA
- Input/Output: 50Ohm
- 100% on-chip testing
- Chip size: 2.5 x 1.6 x 0.1mm

### Functional Block Diagram



### Product Introduction

GLA-0220-2.0 is a broadband low-noise distributed amplifier chip that operates with a single power supply of +5V, covering a frequency range of 2GHz~20GHz, with a small signal gain of 16dB, a P-1dB output power of 13dBm, and a typical noise figure of 2.0dB in the band. GLA-0220-2.0 can achieve automatic gain control by tuning the Vc control terminal voltage. The GLA-0220-2.0 chip via metallization process ensures good grounding; The back of the chip has undergone metalization treatment, suitable for eutectic sintering or conductive adhesive bonding processes.

### Use restriction parameters<sup>1</sup>

Maximum leakage voltage	+9V
Maximum input power	+20dBm
Working temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

【1】 Exceeding any of the above maximum limits may result in permanent damage.

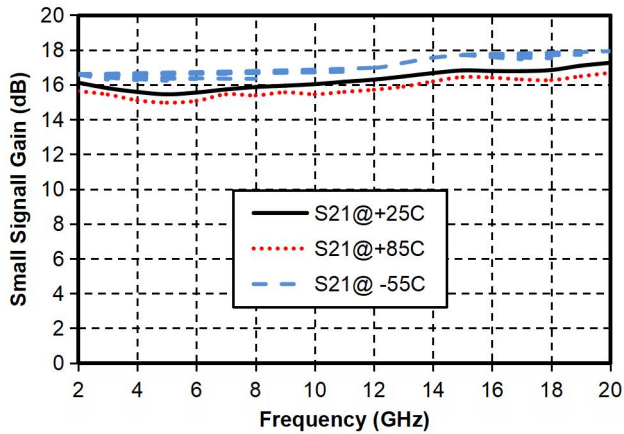
### Electrical performance parameters(T<sub>A</sub> = +25°C, V<sub>d</sub>=+5V)

Index	Minimum value	Typical value	Maximum value	Unit
Frequency range	2-20			GHz
Small signal gain	15.5	16	17.5	dB
Gain flatness		±1.0		dB
Noise figure	-	2.0	3.5	dB
P-1dB	11	13	17.5	dBm
Psat	12.5	14	20	dBm
Input return loss		16		dB
Output return Loss		14		dB
Static current		50		mA

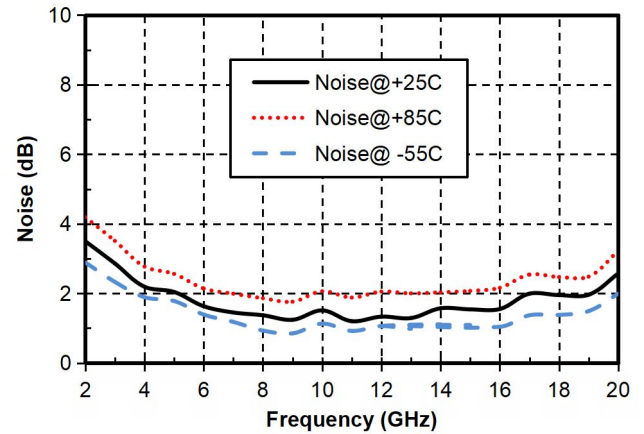
## AGC Low Noise Amplifier Chip, 2-20GHz

Main indicator testing curve

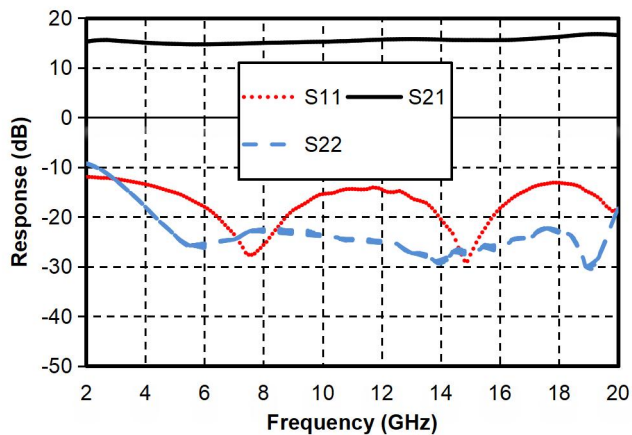
Gain vs. Temperature



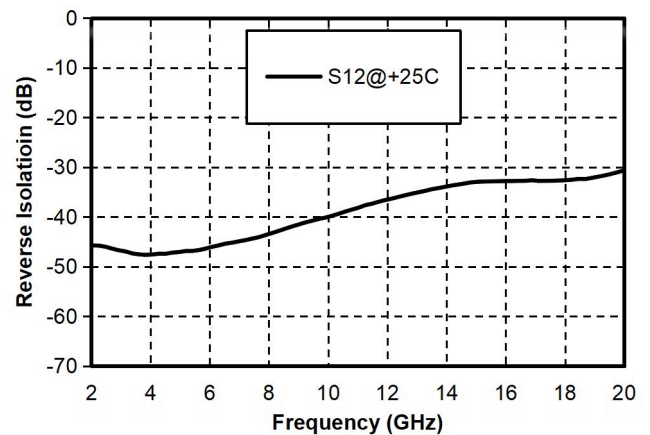
Noise Figure vs. Temperature



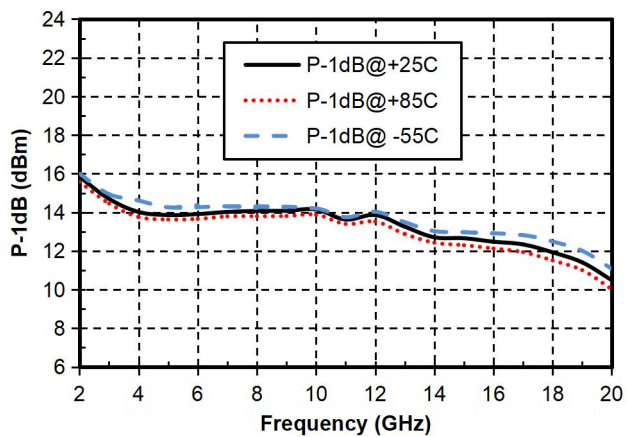
Input return loss vs. Frequency



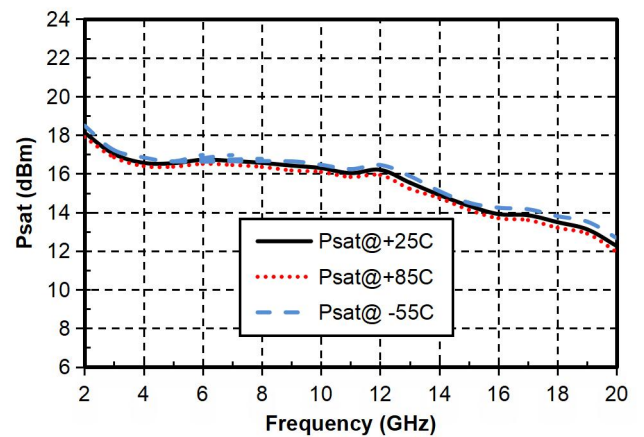
Output return Loss vs. Frequency



P-1dB vs. Temperature

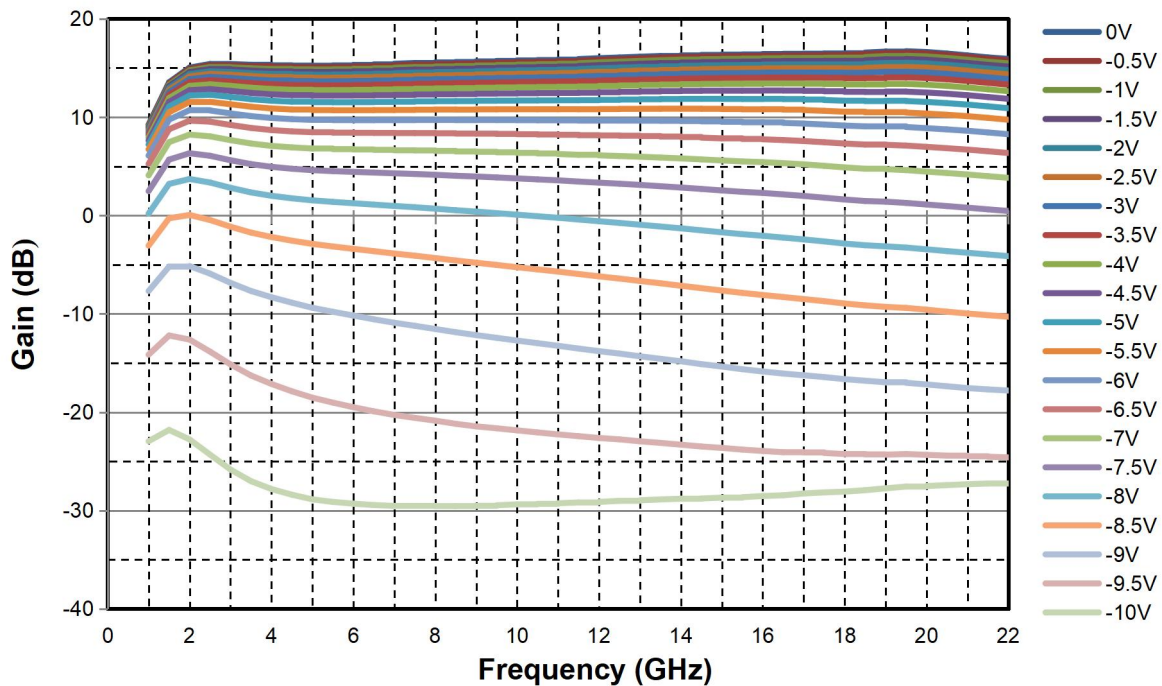


Psat vs. Temperature



## AGC Low Noise Amplifier Chip, 2-20GHz

Gain Vs. Vc



### External structure<sup>2</sup>



【2】 The units in the figure are all millimeters

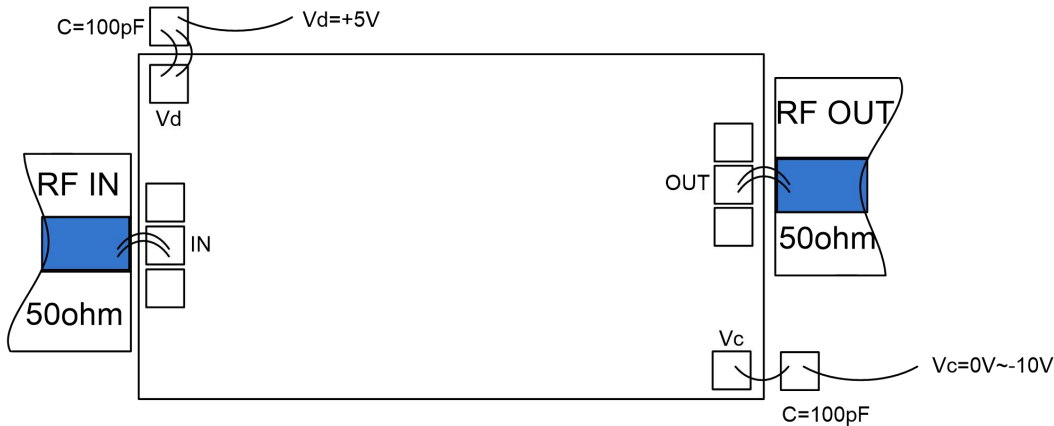
### Definition of bonding pressure point

Bond point number	Functional symbols	Function Description
1	RF IN	RF signal input terminal, no need for DC capacitors.
2	RF OUT	RF signal output terminal, no need for DC isolation capacitor.
3	VDD	Amplifier drain bias, requires an external 100pF bypass capacitor.
4	VC	Gain control terminal, requires an external 100pF bypass capacitor.
Chip bottom	GND	The bottom of the chip needs to be well grounded with RF and DC.

During gain control, there is a certain current present at the VC end.

## AGC Low Noise Amplifier Chip, 2-20GHz

### Recommended assembly diagram



### Notice

- The chip needs to be stored in a container with anti-static function and stored in a nitrogen environment.
- Attempting to clean the surface of bare chips using wet chemical methods is prohibited.
- Please strictly comply with ESD protection requirements to avoid static damage to bare chips.
- Routine operation: Please use precision pointed tweezers to remove the bare chip. During the operation, avoid tools or fingers touching the surface of the chip.
- Suggestion for mounting operation: Bare chip installation can use AuSn solder eutectic sintering or conductive adhesive bonding process. The installation 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 reached 255 °C, and the tool (vacuum chuck) temperature reached 265 °C. When a high-temperature mixed gas (nitrogen to hydrogen ratio of 90/10) is blown onto the chip, the temperature at the top of the tool should be raised to 290 °C. Do not let the chip stay above 320 °C for more than 20 seconds. The friction time should not exceed 3 seconds.
- Bonding process: The amount of conductive adhesive applied should be as small as possible. After placing the chip in the installation position, the conductive adhesive can be vaguely visible around it. Please follow the information provided by the conductive adhesive manufacturer for curing conditions.
- Suggestion for bonding operation: Both spherical or wedge-shaped bonding should be used  $\Phi$  0.025mm (1mil) gold wire. Thermal ultrasonic bonding temperature is 150 °C. The pressure of the spherical bonding cutter is 40-50GF, and the pressure of the wedge bonding cutter is 18-22GF. Use as little ultrasonic energy as possible. The bonding process starts at the pressing point on the chip and ends at the packaging (or substrate).