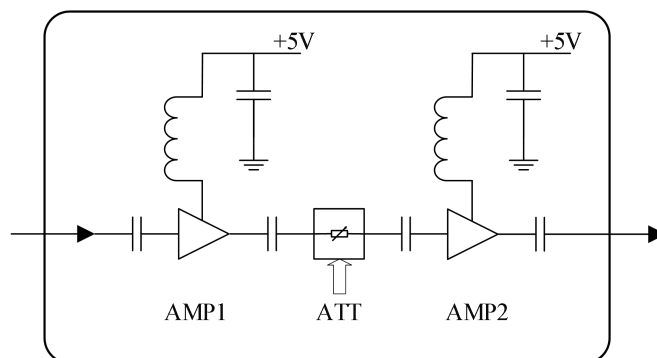


### Performance characteristics

- Operating frequency: 1~9GHz
- Gain: 29dB
- NF: 1.9dB
- P-1dB: 15dBm
- Outline Dimensions: 10x8x2.5mm

### Principle diagram



### Product introduction

The GF030109Q2 programmable amplifier chip adopts GaAs technology, integrates an amplifier and a digital attenuator internally, with a frequency coverage range of 1-9 GHz. It can not only achieve gain amplification but also gain adjustment, with an attenuation range of 0~31.5dB and a step of 0.5dB. The numerical control attenuation chip adopts 0/+5V voltage control and is housed in a ceramic package, suitable for SMT.

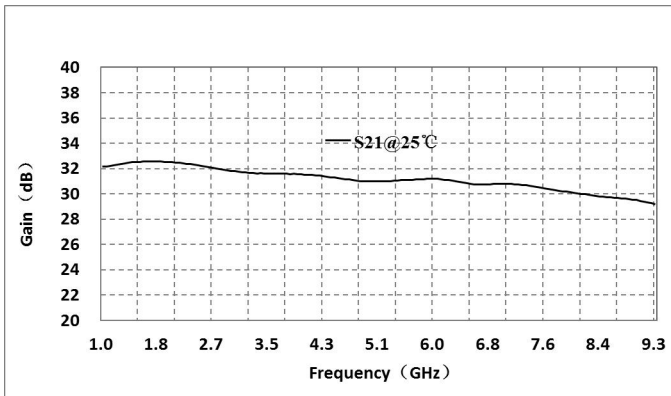
Absolute maximum ratings	
Parameter	Ratings
VDD	+5.5V
Input power	+20dBm
Operating temperature	-55~+85°C
Storage temperature	-55~+150°C
Note: Exceeding any of these limits may cause permanent damage.	

### Electrical parameters(TA = +25°C, 50Ω system)

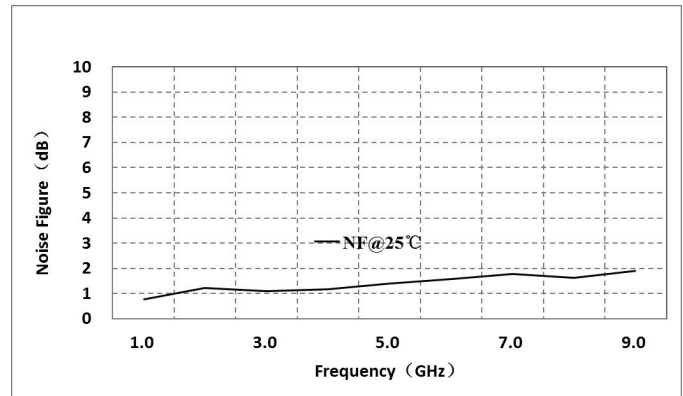
Parameter	Min	Typ	Max	Unit
Operating frequency	1		9	GHz
Gain		29		dB
Gain flatness		±1.5		dB
Noise figure		1.9		dB
Bit count		6		bit
Attenuation step		0.5		dB
Attenuation accuracy		±1		dB
Input return loss		-15		dB
Output return Loss		-15		dB
P-1dB		15		dBm
VDD current		90		mA
VEE current		10		mA

### Main indicator testing curve

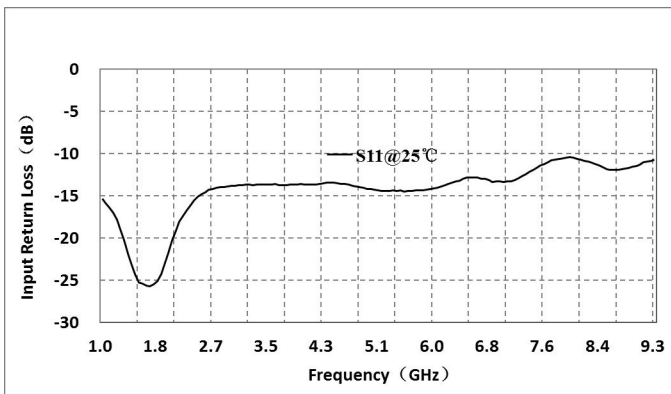
Gain VS. Frequency



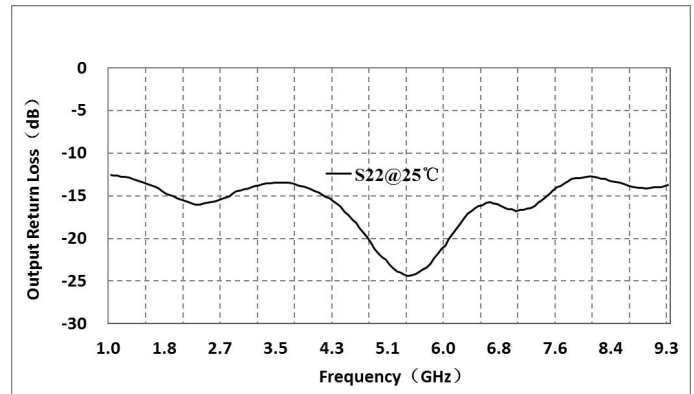
Noise figure VS. Frequency



Input return loss VS. Frequency

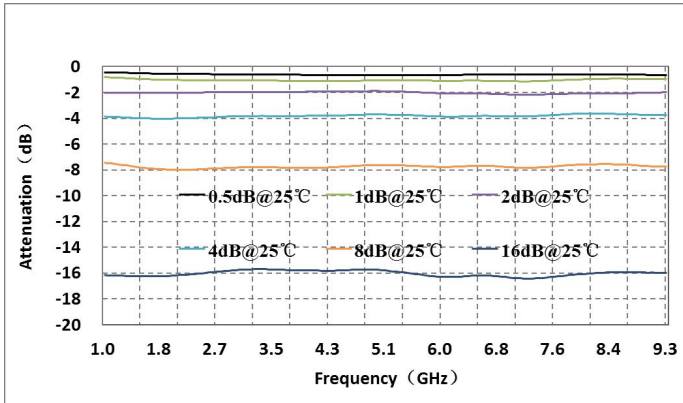


Output return loss VS. Frequency

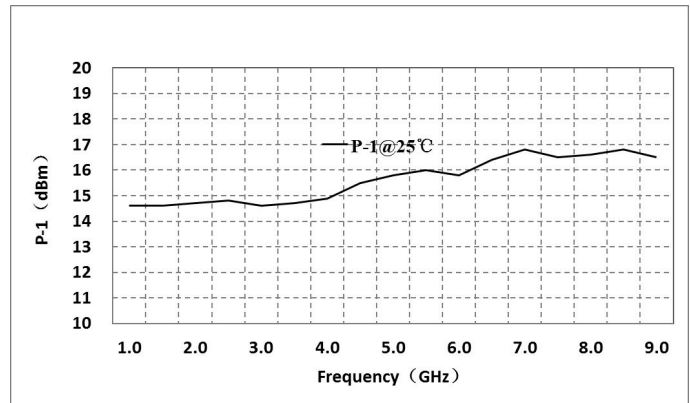


## Programmable amplifier chip, 1~9GHz

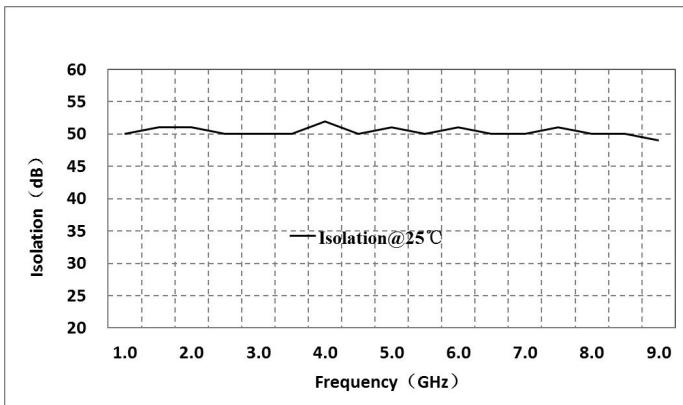
Attenuation VS. Frequency



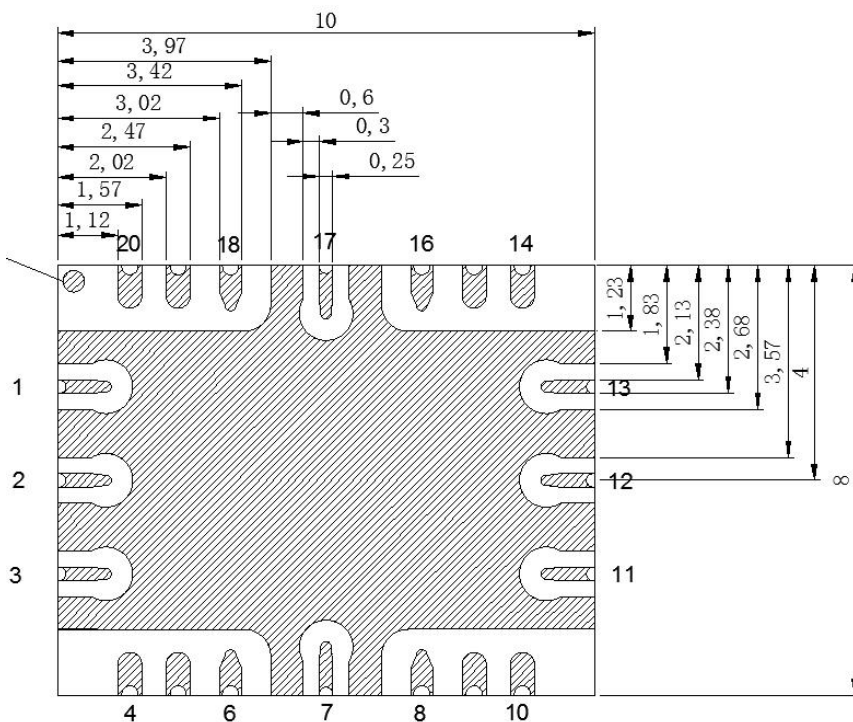
P-1 VS. Frequency



Isolation VS. Frequency



### External structure



## Programmable amplifier chip, 1~9GHz

Pin	Function	Description
1、13	VDD	+5V power supply
2	RFin	RF input, no need for blocking capacitors
3~11	GND	Ground
12	RFout	RF output, no need for blocking capacitors
14	0.5dB attenuation control bit A1	When A1=0, the 0.5dB attenuator is turned off, and when A1=5V, the 0.5dB attenuator is turned on
15	1dB attenuation control bit A2	When A2=0, the 1dB attenuator is turned off, and when A2=5V, the 1dB attenuator is turned on
16	2dB attenuation control bit A3	When A3=0, the 2dB attenuator is turned off, and when A3=5V, the 2dB attenuator is turned on
17	4dB attenuation control bit A4	When A4=0, the 4dB attenuator is turned off, and when A4=5V, the 4dB attenuator is turned on
18	8dB attenuation control bit A5	When A5=0, the 8dB attenuator is turned off, and when A5=5V, the 8dB attenuator is turned on
19	16dB attenuation control bit A6	When A6=0, the 16dB attenuator is turned off, and when A6=5V, the 16dB attenuator is turned on
20	VEE	This pin is a TTL level conversion circuit power port, connected to a -5V power supply

Truth table						
state	0.5dB	1dB	2dB	4dB	8dB	16dB
	A1	A2	A3	A4	A5	A6
reference	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1dB	0	1	0	0	0	0
2dB	0	0	1	0	0	0
4dB	0	0	0	1	0	0
8dB	0	0	0	0	1	0
16dB	0	0	0	0	0	1

"0" level range: 0~0.8V; "1" Level range: 2.3~5V

### Note:

- Unit: mm;
- It is recommended to connect a protective resistor of 1K ohms or more in series with the control input terminal;
- The device should be stored in a dry and nitrogen environment. When the device cannot be used up after being unpacked, it should be immediately stored in a drying oven or vacuum sealed to avoid absorbing moisture from the air;
- Devices are sensitive to static electricity, and attention should be paid to anti-static measures during storage, transportation, assembly, and use;

## Programmable amplifier chip, 1~9GHz

- Please connect all grounding pins to RF ground;
- This product is suitable for reflow soldering installation process, with a maximum reflow soldering peak temperature of 260 °C.