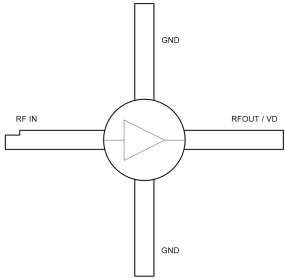


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

Product Introduction

GHLN- 9028B-X is a gallium arsenide monolithic amplifier operating at 0.05 - 4 GHz . The amplifier operates at +5V and biases the circuit through an external choke inductor at the output. It provides 13.5dB gain and 19 dBm P - 1 dB output power at 80 mA operating current . The chip is packaged in a ceramic cross package to achieve airtight packaging. The surface of the pin pad is gold-plated and is suitable for reflow soldering installation.

Block Diagram	Product Features
 <p>Bottom view</p>	<p>Working frequency: 50-4 000MHz Noise figure : 2.3dB@1900MHz Small signal gain: 13.8 ± 0.6 dB from 0.5-4GHz P-1dB: 19dBm Typ. OIP3 : 3-5 dBm 50Ohm input and output +5V /80mA Ceramic Micro-X</p>

Electrical performance parameters (TA = +25°C, Vd = +5V, 50Ω system)					
Index	Test Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Range		50		4000	MHz
Test frequency			1900		MHz
Small Signal Gain			13.5		dB
Input return loss			13		dB
Output return loss			15		dB
P-1			20		dBm
OIP3	Pout=+ 5 dBm /tone, Δf =1 MHz		34.5		dBm
Noise Figure*	Without de-embedding, the estimated evaluation board loss is 0.15dB@1.9G		2.2		dB
Current	On state		80		mA
Thermal resistance	channel to case		40		°C/W

*Noise figure is the test data without de -embedding .

High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

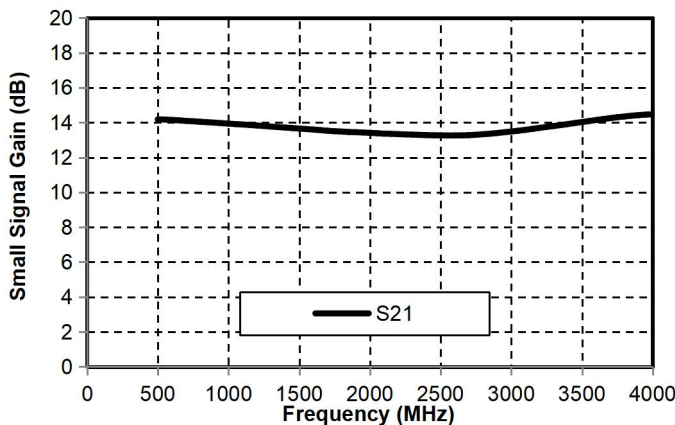
500M-4000M electrical performance parameters

Electrical performance parameters (TA = +25°C, Vd = +5V, 50Ω system)							
Index	Typical Value						Unit
Test frequency	500	900	1900	2700	3500	4000	MHz
Small Signal Gain	14	14	13.5	13.2	14	14.5	dB
Input return loss	17	17	13	12	12	9	dB
Output return loss	11	12.5	15	15	16	twenty one	dB
P-1	19.5	19.5	20	19.5	19	18	dBm
OIP3*	36	35.5	34.5	34.5	34.5	33.5	dBm
Noise Figure**	1.9	1.9	2.2	2.7	3.3	4.2	dB

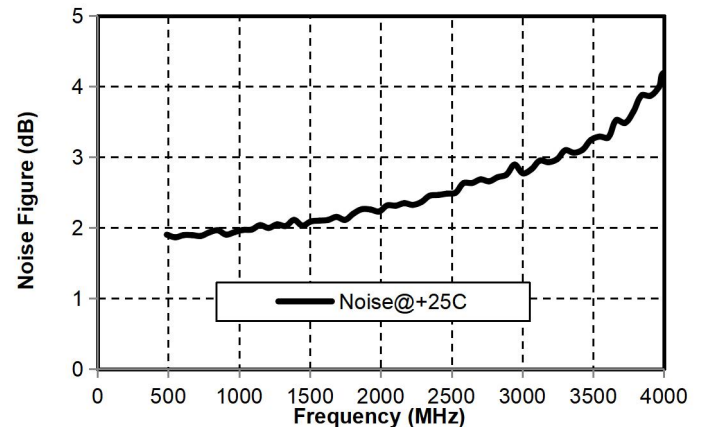
* Pout = + 5 dBm /tone, Δf =1 MHz .

** Noise figure is the test data without de -embedding .

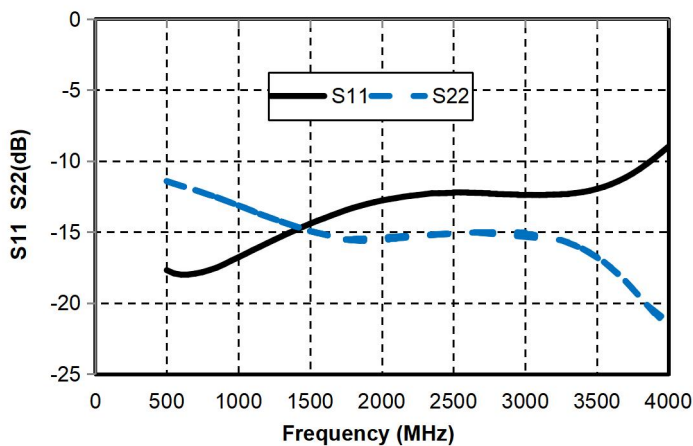
Small Signal Gain vs. Frequency



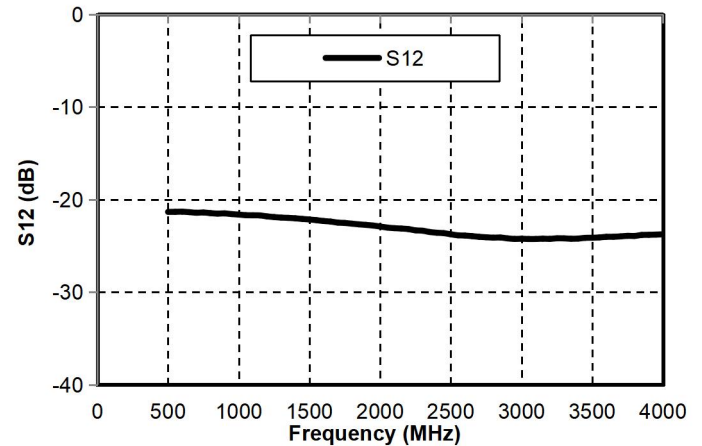
Noise Figure vs. Frequency



Input /Output Return Loss vs. Frequency

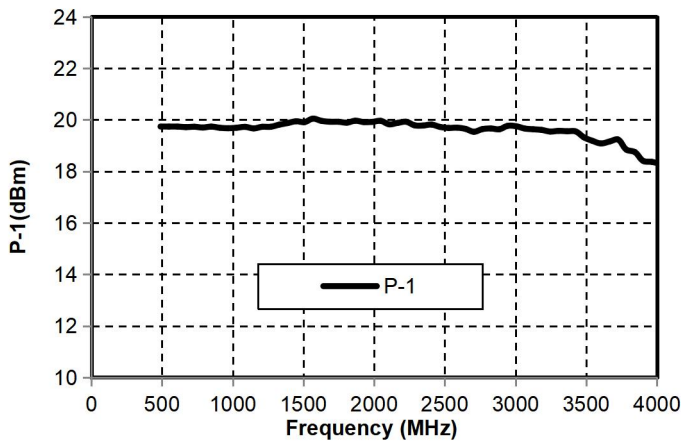


Reverse Isolation vs. Frequency

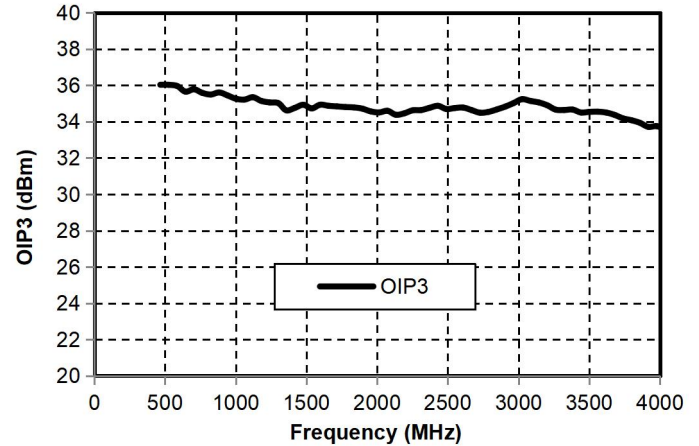


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

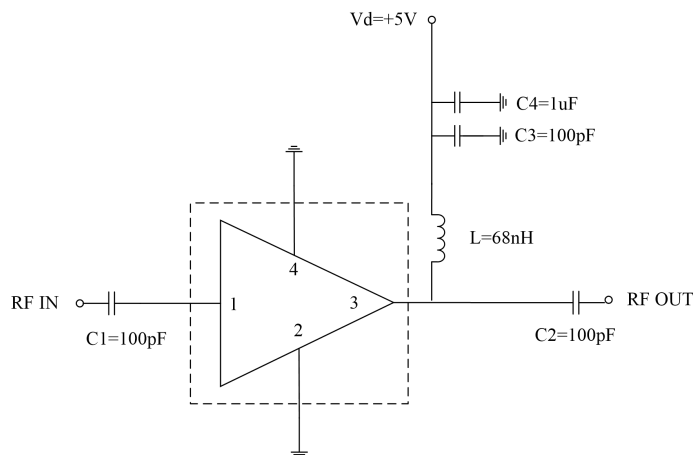
P-1dB vs. Frequency



OIP3 vs. Frequency



500M-4000M recommended circuit diagram



Precautions

- 1、 The resistance , capacitance and inductance values need to be adjusted accordingly according to the actual application frequency.

Pin Definition		
Bonding point number	Function Symbol	Functional Description
1	RF IN	RF signal input terminal; external DC blocking capacitor is required
3	RFOUT	RF signal output terminal; external DC blocking capacitor is required ; amplifier leakage bias, the circuit is biased at the output terminal through external current -choking inductor and bias resistor
2, 4	GND	No welding required

High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

50M-500M electrical performance parameters

GHLN-9028B-X can achieve 50-500 MHz intermediate frequency operation by properly adjusting the bias inductor value and DC capacitor value .

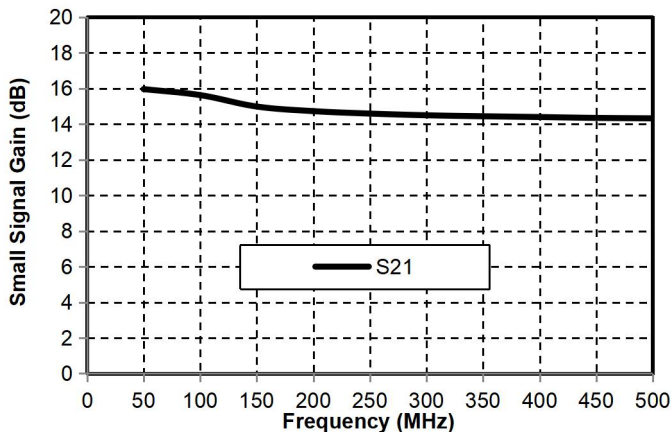
Electrical performance parameters (TA = +25°C, Vd = +5V, 50Ω system)

index	Typical Value						unit
	50	100	200	300	400	500	
Test frequency	50	100	200	300	400	500	MHz
Small Signal Gain	16	15.5	14.7	14.5	14.4	14.3	dB
Input return loss	7.5	13	17	17.5	17.5	17.5	dB
Output return loss	13.5	15.5	12.5	12.5	12.5	12.5	dB
P-1	18	19	20	20	20	20	dBm
OIP3*	36	36.5	36	35.5	35.5	35.5	dBm
Noise Figure**	1.9	1.9	1.9	1.9	1.9	1.9	dB

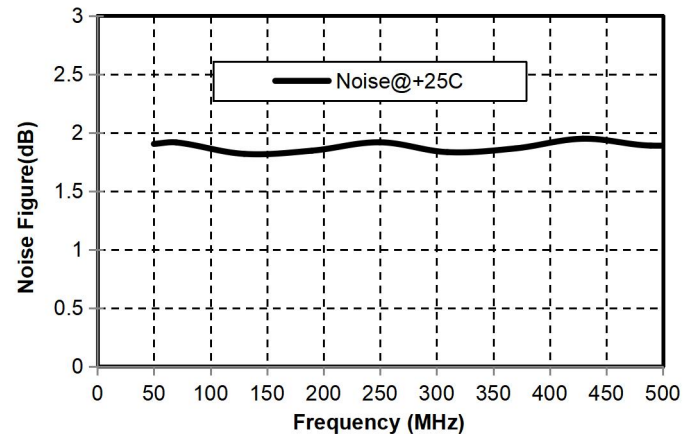
* Pout = + 5 dBm /tone, Δf =1 MHz .

** Noise figure is the test data without de -embedding .

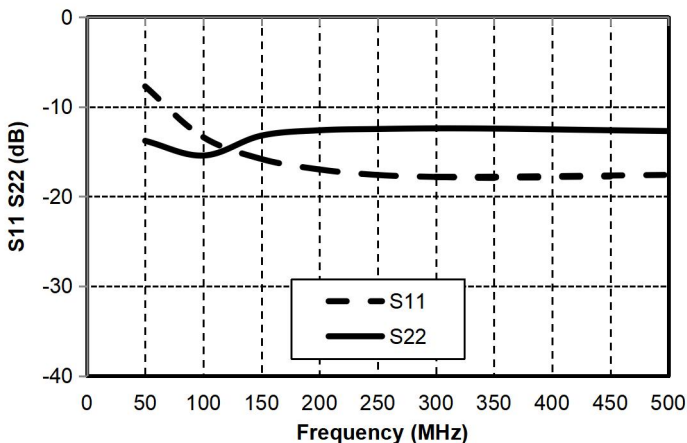
Small Signal Gain vs. Frequency



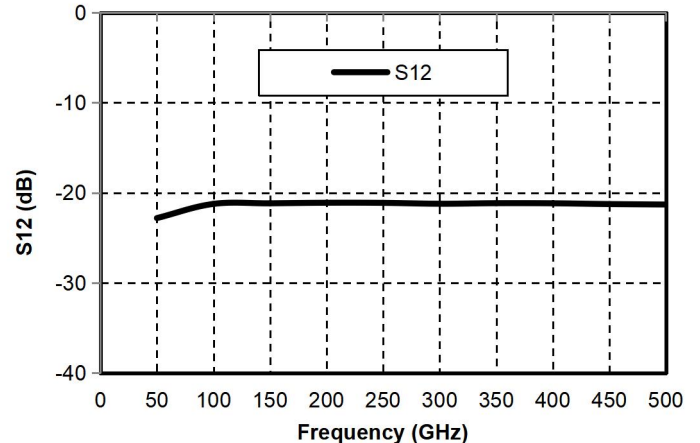
Noise Figure vs. Frequency



Input /Output Return Loss vs. Frequency

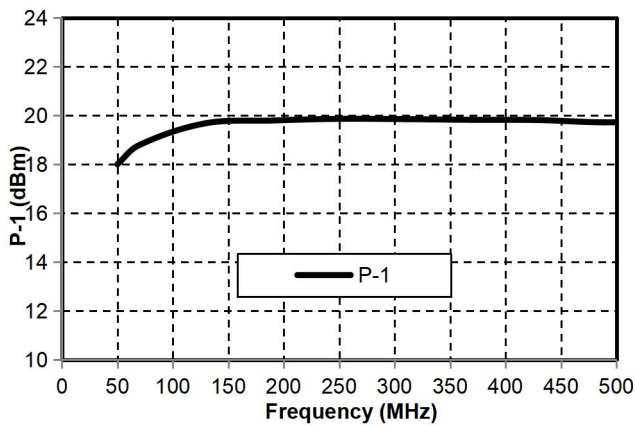


Reverse Isolation vs. Frequency

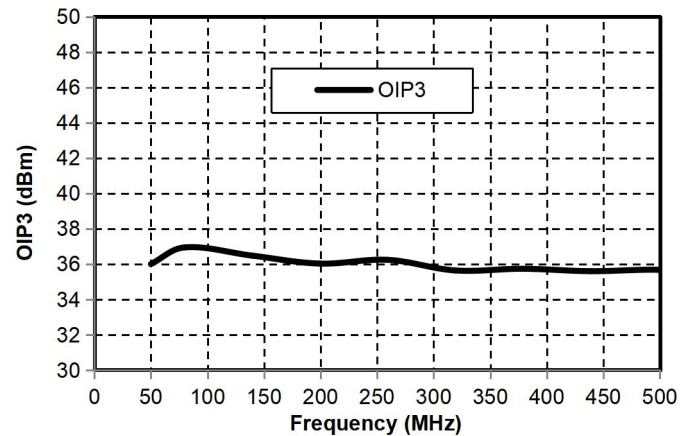


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

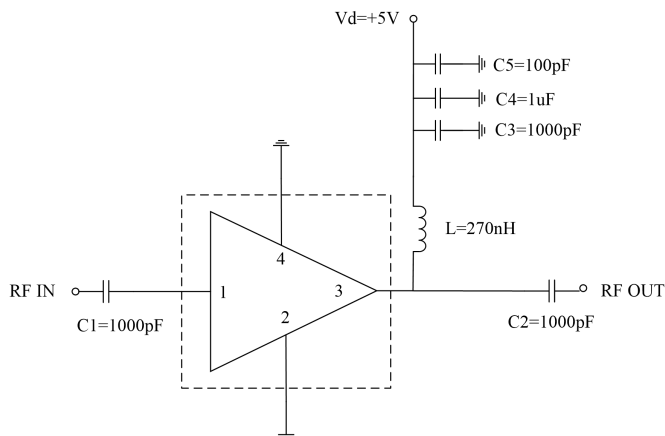
P-1dB vs. Frequency



OIP3 vs. Frequency



50M-500M recommended circuit diagram



Precautions

- 1、 The resistance , capacitance and inductance values need to be adjusted accordingly according to the actual application frequency.

Pin Definition		
Bonding point number	Function Symbol	Functional Description
1	RF IN	RF signal input terminal; external DC blocking capacitor is required
3	RFOUT	RF signal output terminal; external DC blocking capacitor is required ; amplifier leakage bias, the circuit is biased at the output terminal through external current -choking inductor and bias resistor
2, 4	GND	No welding required

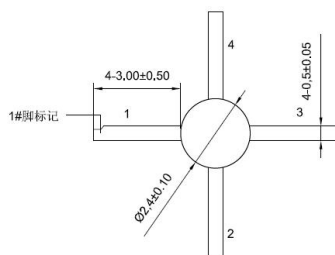
High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

Use restriction parameter ¹

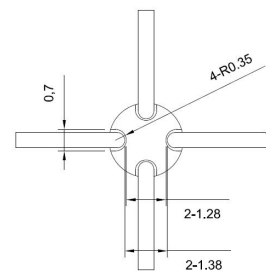
Collector voltage: +7V	Input power: +23dBm
Operating temperature: -40 ~ +70 ° C	Storage Temperature: -65 ~ +150°C

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

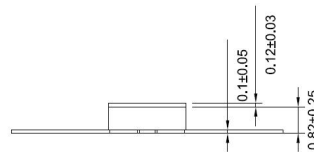
Appearance structure



Bottom view



Bottom view



Side View

All units in the figures are millimeters .

Precautions for use

- Sealing material : Ceramic material that meets ROHS standards
- Cover plate: Kovar alloy
- Lead frame material: Kovar
- Lead surface plating: gold, gold layer thickness greater than 1.5um
- Maximum reflow peak temperature: 260 °C