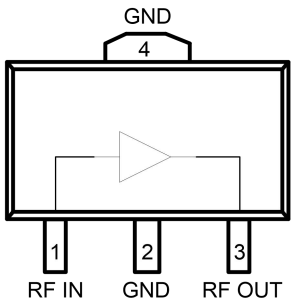


## High Linearity Low Noise Gain Amplifier , 50 - 3000 MHz

### Product Introduction

GHLN- 9028A-S89 is a 100 MHz~ 3000M Hz ultra-wideband, high linearity, low noise gain block amplifier. This amplifier can meet the needs of a variety of application scenarios, including small base stations, walkie-talkies, LTE/WCDMA communication systems and other wireless communication systems. GHLN-90 28A-S89 uses a standard SOT89 label package, and all pins are equipped with ESD protection. GHLN-90 28A-S89 biases the circuit through an external choke inductor, and a DC blocking capacitor needs to be added to the periphery of the circuit. The product quality level is industrial grade.

Block Diagram	Product Features
 <p style="text-align: center;">Bottom view</p>	<p>Operating frequency: 100 - 3 000MHz            Noise figure : 1.9 dB            Small signal gain: 1 4.5 ± 1.2 dB from 100-3000MHz            P-1dB: 17dBm Typ.            OIP3 : 3-5 dBm            50Ohm input and output            +5V /80mA            SOT89 plastic package</p>

Electrical performance parameters ( TA = +25°C, Vd = +5V, 50Ω system)					
Index	Test Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Range		100		3000	MHz
Test frequency			1900		MHz
Small Signal Gain			14		dB
Input return loss			22		dB
Output return loss			16		dB
P-1			17		dBm
OIP3	Pout=+4 dBm /tone, Δf =1 MHz		34		dBm
Noise Figure*	Without de-embedding, the estimated evaluation board loss is 0.15dB@1.9G		1.9		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 , 100 - 3000 MHz

100M-3000M electrical performance parameters

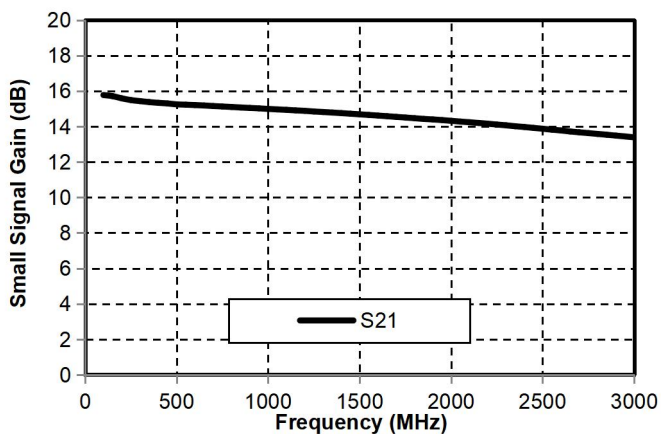
Electrical performance parameters ( TA = +25°C, Vd = +5V, 50Ω system)

Index	Typical Value								Unit
	100	500	900	1200	1700	2300	2700	3000	
Test frequency	100	500	900	1200	1700	2300	2700	3000	MHz
Small Signal Gain	15.7	15.2	15	14.8	14.5	14	13.5	13.3	dB
Input return loss	8	35	23	21	20	26	22	16.5	dB
Output return loss	10	12	14	15	17	14	11.4	9.5	dB
P-1	17	17.5	17.5	17.5	17	17	16.5	16.2	dBm
OIP3*	39	37	36.5	36	35	33	32	32	dBm
Noise Figure**	1.8	1.8	1.8	1.9	1.9	2.0	2.2	2.2	dB

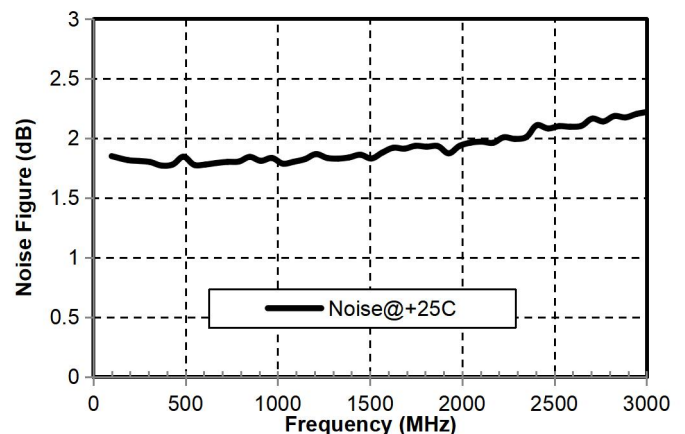
\* Pout=+4 dBm /tone, Δf =1 MHz .

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

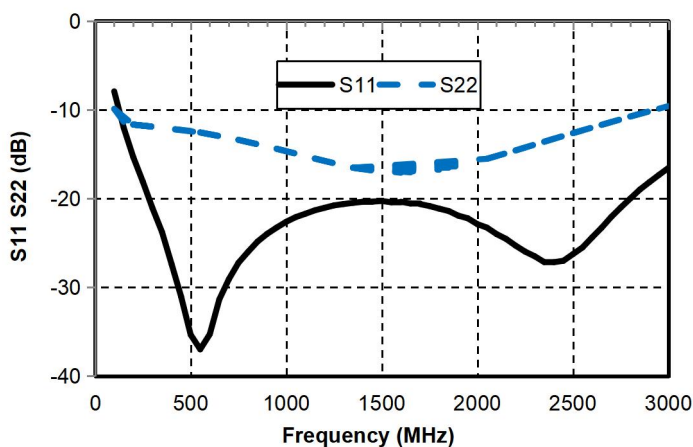
Small Signal Gain vs. Frequency



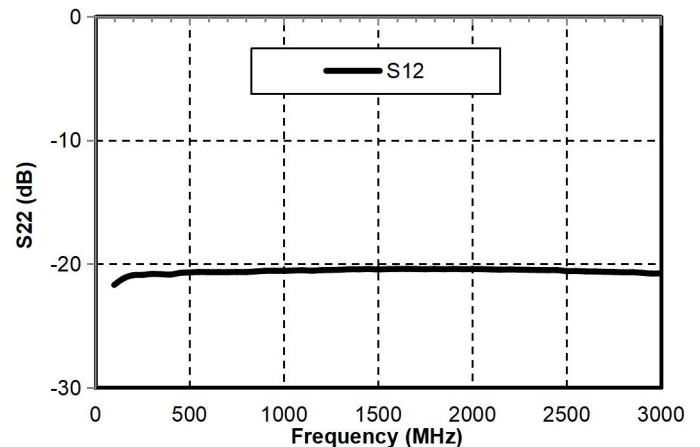
Noise Figure vs. Frequency



Input /Output Return Loss vs. Frequency

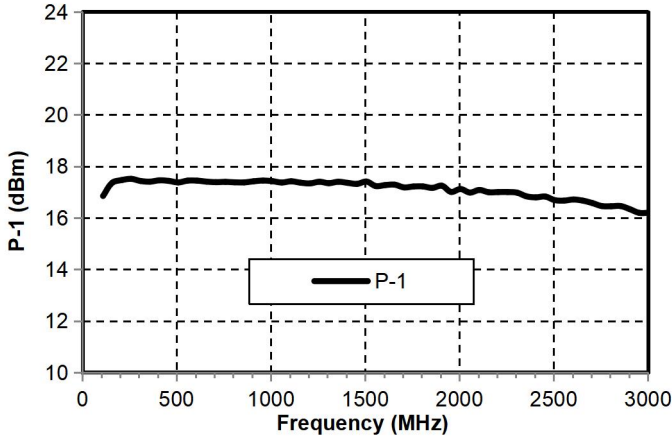


Reverse Isolation vs. Frequency

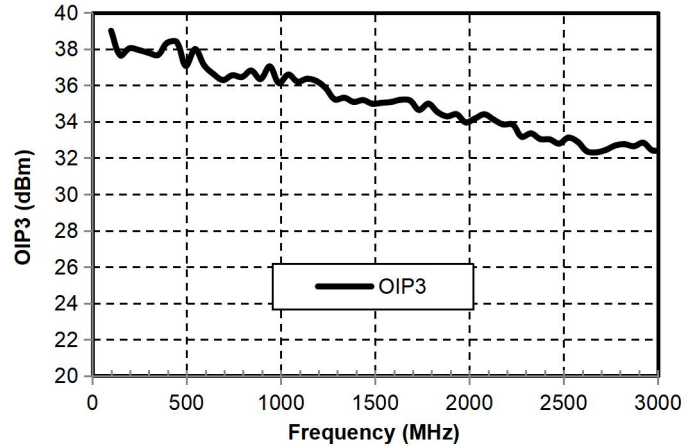


## High Linearity Low Noise Gain Amplifier , 100 - 3000 MHz

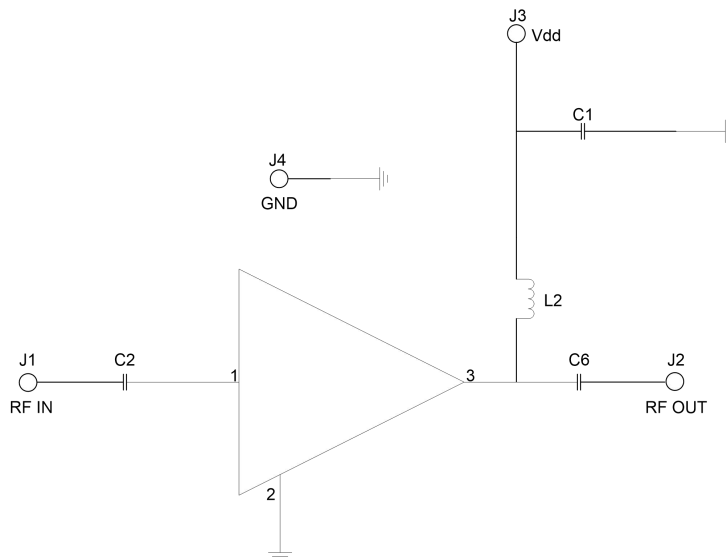
P-1dB vs. Frequency



OIP3 vs. Frequency



### 100M-3000M recommended circuit diagram



### Precautions

- 1、 All resistors and capacitors are packaged in 0603
- 2、 The resistance , capacitance and inductance values need to be adjusted accordingly according to the actual application frequency.

### Ingredients list

Raw material	RC Inductance	Describe	Brand
L 2	68nH	Inductor, 0603, 5%	various
C 1	0.01 uF	CAP, 0603, 5%, 50V, X7R	various
C2, C6	100pF	CAP, 0603, 5%, 100V, NPO/COG	various

## High Linearity Low Noise Gain Amplifier , 100 - 3000 MHz

Pin Definition		
Bonding point number	Function Symbol	Functional Description
1	RF IN	RF input port, impedance 50ohm , requires external DC blocking capacitor
3	RF OUT / DC Bias	RF output port, impedance 50ohm, amplifier leakage bias, bias the circuit at the output end through external current-choking inductor and bias resistor, external DC blocking capacitor is required
2, 4	GND	The bottom of the chip needs to be well grounded to RF and DC

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

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

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

### Environmental conditions

Parameter	Grade	Standard
ESD – Human Body Model (HBM)	1A	ESDA / JEDEC JS-001-2014
ESD – Charged Device Model (CDM)	C3	ESDA / JEDEC JS-001-2014
MSL – Moisture Sensitivity Level	LEVEL 1	IPC/JEDEC J-STD-020

### Precautions for use

- Plastic package material : Low-pressure injection molding plastic that meets ROHS specifications
- Lead frame material: Nickel alloy
- Lead surface plating: 100% matte tin
- Maximum reflow peak temperature: 260 °C