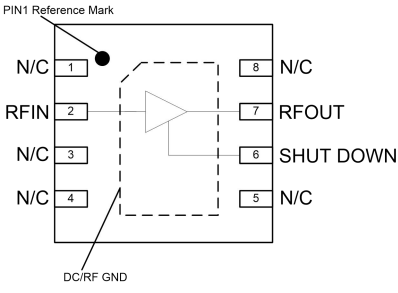


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

Product Introduction

GHLN-9035 -DF2-8 is a 50MHz~4GHz 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-9035 -DF2-8 adopts the standard DFN2X2 label package. The amplifier integrates shutdown bias capability and all pins are equipped with ESD protection. GHLN-9035 -DF2-8 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>Working frequency : 50-4 000MHz Noise figure: 0.6dB@1900MHz Small signal gain: 18.5dB @ 1900 MHz P-1dB: 22dBm OIP3 : 3-6 dBm Integrated shutdown function 50Ohm input and output +5V /110mA 2x2 mm 8 Pin DFN plastic package</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			18.5		dB
Input return loss			11		dB
Output return loss			15		dB
P-1			22		dBm
OIP3	Pout=+4 dBm /tone, Δf =1 MHz		36		dBm
Noise Figure*	Without de-embedding, the estimated evaluation board loss is 0.15dB@1.9G		0.6		dB
Switching speed	Rise Time (10%-90%)		170		ns
	Fall Time (90%-10%)		260		ns
Shutdown control	On state	0		0.8	V
	Off state (Power down)	3		VDD	V
Current	On state		110		mA
	Off state (Power down)		3		mA
Shutdown pin current	V _{PD} ≥ 3V		100		uA
Thermal resistance	channel to case			50	°C/W

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

**GHLN-9035 -DF2-8 can work up to 5GHz , please ask the manufacturer for information.

*** GHLN-9035 -DF2-8 supports +3V operation, please ask the manufacturer for information.

High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

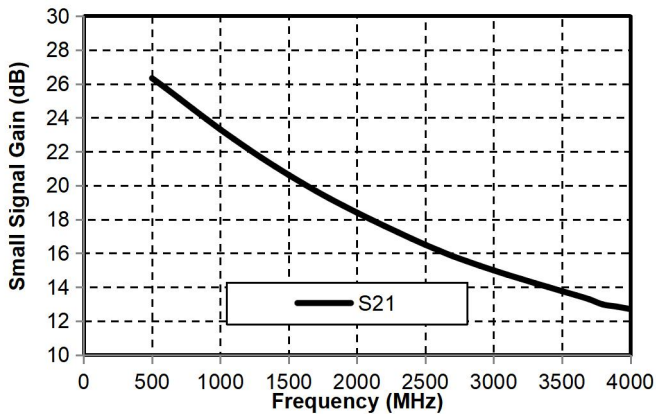
500M-4000M electrical performance parameters

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

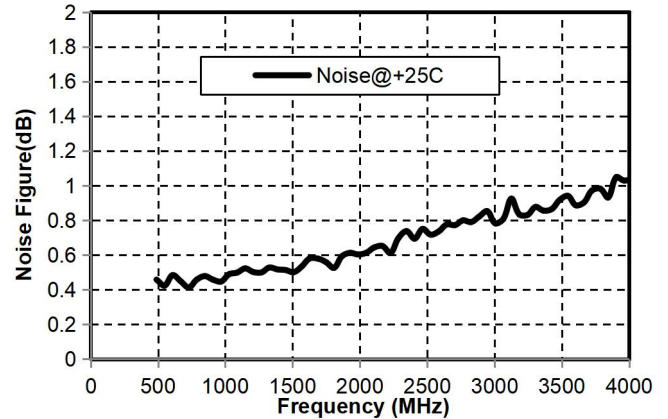
Index	Test Conditions	Typical Value					Unit
		900	1900	2600	3600	5000	
Test frequency		900	1900	2600	3600	5000	MHz
Small Signal Gain		23.5	18.5	16	13.5	10.5	dB
Input return loss		12	11	11	9.5	6.5	dB
Output return loss		15.5	15	13	11	11	dB
P-1		22	22	22.5	22.5	20.5	dBm
OIP3	Pout=+4 dBm /tone, Δf =1 MHz	37	36	36.5	35.5	33.5	dBm
Noise Figure*		0.45	0.6	0.8	0.9	1.3	dB

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

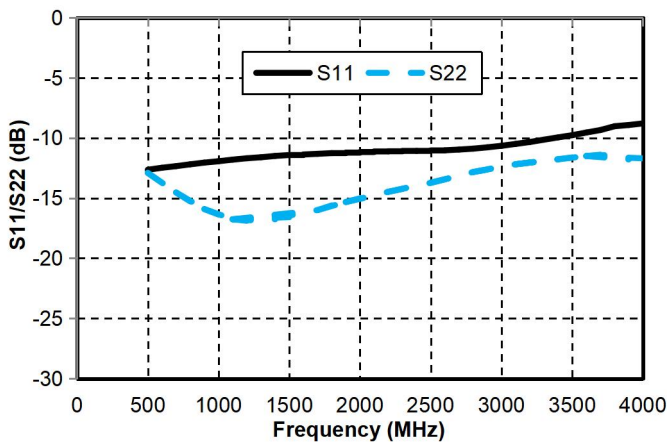
Small Signal Gain vs. Frequency



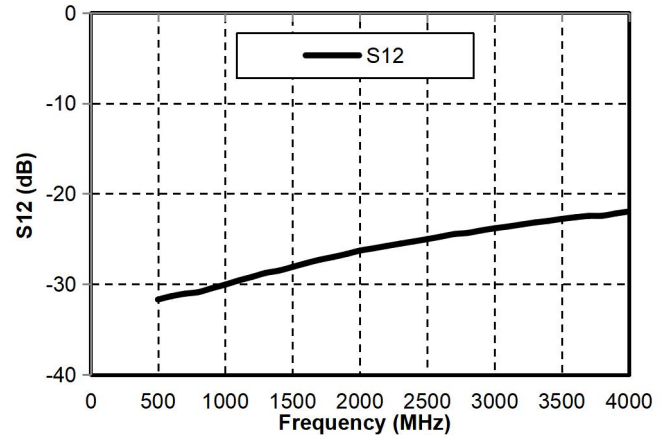
Noise Figure vs. Frequency



Input /Output Return Loss vs. Frequency

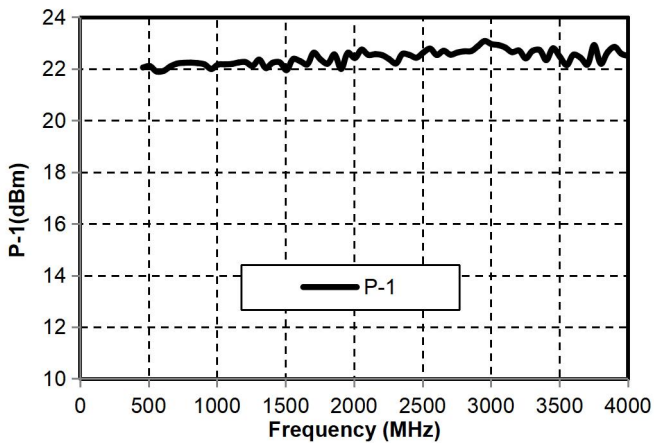


Reverse Isolation vs. Frequency

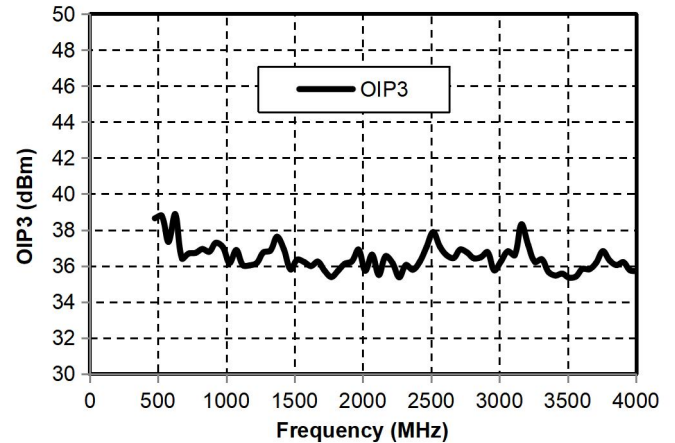


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

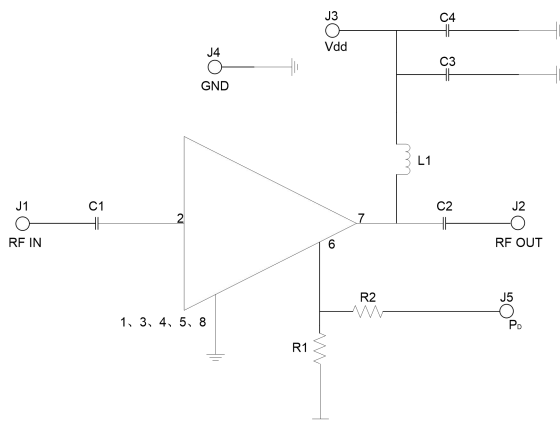
P-1dB vs. Frequency



OIP3 vs. Frequency



500M-4000M recommended circuit diagram



Precautions

- 1、 All resistors and capacitors are packaged in 0402
- 2、 The capacitance values of C1 , C2 and C3 need to be adjusted according to the actual application frequency.
- 3、 The inductance of L1 needs to be adjusted accordingly according to the actual application frequency.
- 4、 If not needed, R1 and R2 can be not installed; when R1 and R2 are not installed, the amplifier is always in working state.

Ingredients list

raw material	RC Inductance	describe	Brand
R1	10KΩ	Resistor, Chip, 0402, 5%, 1/16W	various
R2	33K Ω	Resistor, Chip, 0402, 5%, 1/16W	various
L1	68 nH	Inductor, 0603, 5%, Ceramic	various
C4	1.0 uF	Cap., Chip, 0402, 10%, 10V, X5R	various
C1, C2, C3, C5, C6	100 pF	Cap., Chip, 0402, 5%, 50V, NPO/COG	various

High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

50M-500M electrical performance parameters:

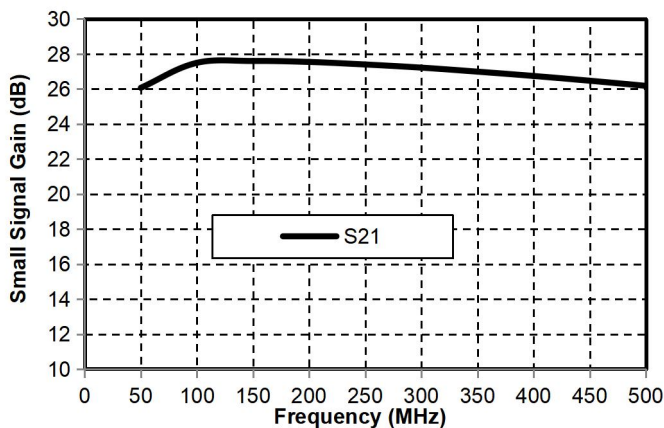
GHLN-9035-DF2-8 can achieve 50-500 MHz intermediate frequency operation by properly adjusting the bias induct value and DC capacitor value .

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

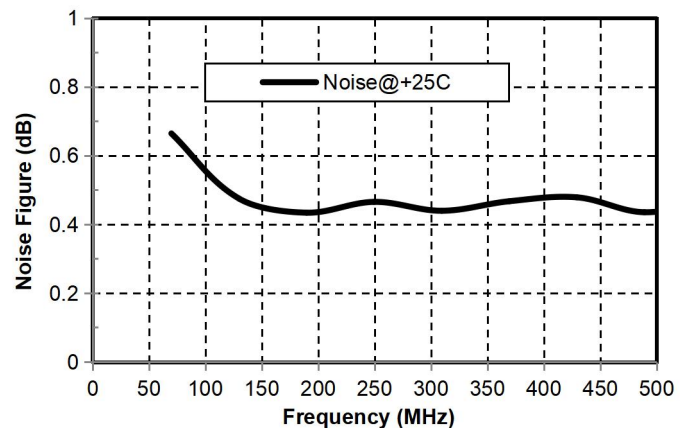
Index	Test Conditions	Typical Value				Unit
Test frequency		50	100	200	500	MHz
Small Signal Gain		26	27	27.5	26	dB
Input return loss		3.5	7.5	11.5	12.5	dB
Output return loss		4.5	7.5	9.6	12	dB
P-1		18	20.5	21.5	22	dBm
OIP3	Pout=+4 dBm /tone, Δf =1 MHz	37	37	38	37.5	dBm
Noise Figure*		0.6	0.55	0.45	0.45	dB

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

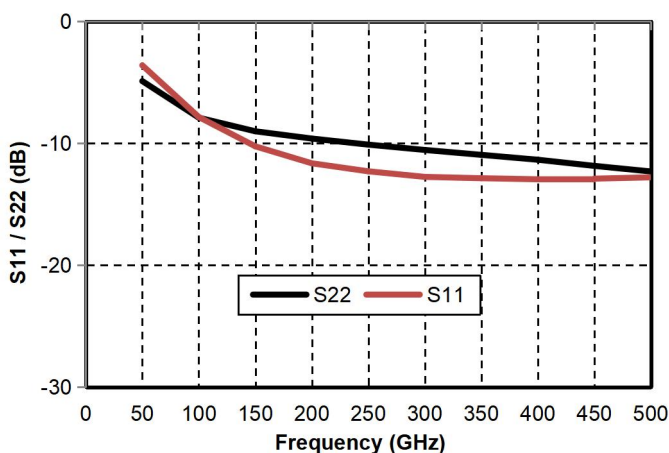
Small Signal Gain vs. Frequency



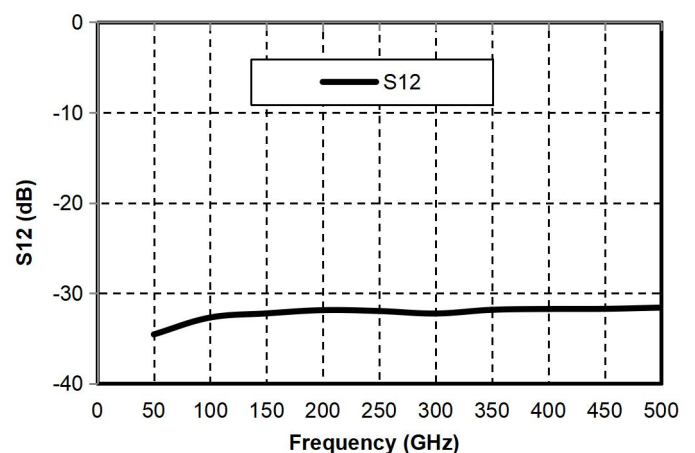
Noise Figure vs. Frequency



Input /Output Return Loss vs. Frequency

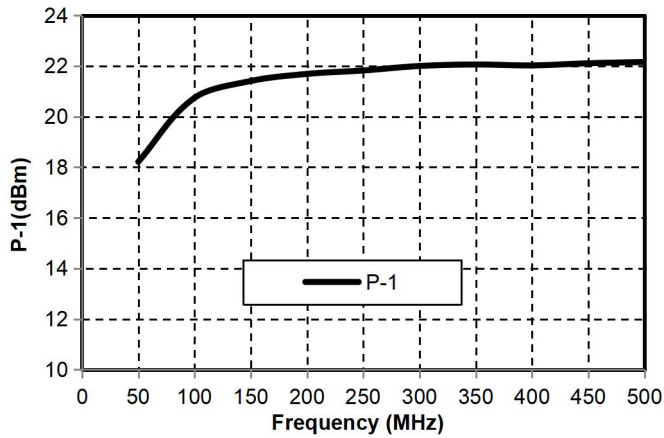


Reverse Isolation vs. Frequency

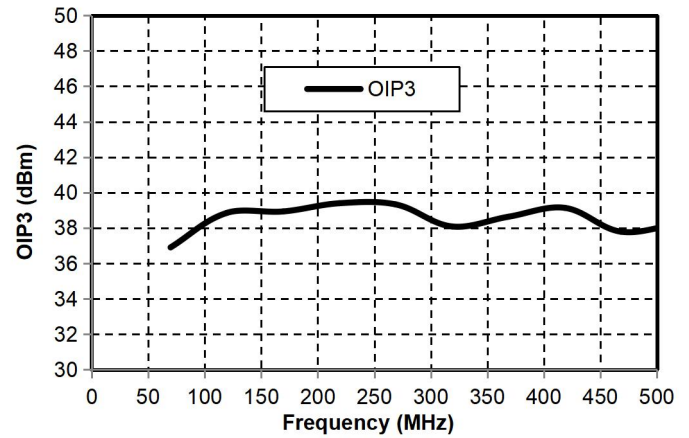


High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

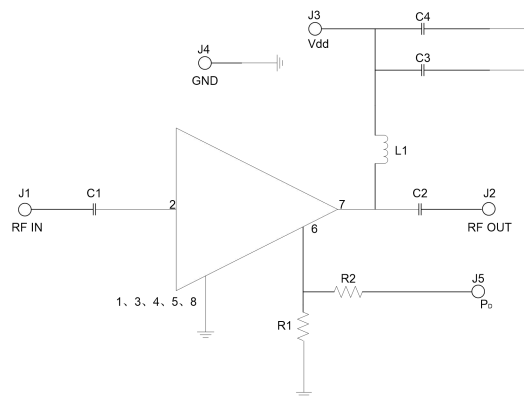
P-1dB vs. Frequency



OIP3 vs. Frequency



50M-500M recommended circuit diagram



Precautions

- 1、 All RC components are in 0402 package
- 2、 The capacitance values of C1 , C2 and C3 need to be adjusted according to the actual application frequency.
- 3、 The inductance of L1 needs to be adjusted accordingly according to the actual application frequency.
- 4、 If not needed, R1 and R2 can be not installed; when R1 and R2 are not installed, the amplifier is always in working state.

Ingredients list

Raw material	RC Inductance	describe	Brand
R1	10KΩ	Resistor, Chip, 0402, 5%, 1/16W	various
R2	33K Ω	Resistor, Chip, 0402, 5%, 1/16W	various
R3	0 Ω	Resistor, Chip, 0402, 5%, 1/16W	various
L1	82 nH	Inductor, 0603, 5%, Ceramic	various
C4	1.0 uF	Cap., Chip, 0402, 10%, 10V, X5R	various
C1, C2, C3, C5, C6	1000 pF	Cap., Chip, 0402, 5%, 50V, NPO/COG	various

High Linearity Low Noise Gain Amplifier , 50 - 4000MHz

Pin Definition		
Bonding point number	Function Symbol	Functional Description
2	RF IN	RF input port, impedance 50ohm , requires external DC blocking capacitor
6	Shut Down	Shutdown control port
7	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
1, 3, 4, 5, 8	NC	No welding required
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

Use restriction parameter ¹	
Collector voltage: +6V	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: copper alloy
- Lead surface plating: 100% matte tin
- Maximum reflow soldering peak temperature: 260°C