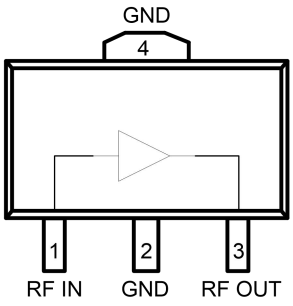
GHLN-014A

High Linearity Low Noise Gain Amplifier , 80 - 3000 MHz

Product Introduction

GHLN- 014A is an 80MHz ~ 3GHz 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 -014A adopts a standard SOT-353 label package, and all pins are equipped with ESD protection. GHLN- 014 biases the circuit through an external choke inductor , and a DC blocking capacitor needs to be added to the periphery of the circuit . The chip supports +3V and +5V operation. This product is industrial grade.

Block Diagram	Product Features
 Top view	Working frequency band : 80-3000MHz Noise figure : 1.5dB Small signal gain: 15dB Gain flatness : ±1.2 dB (full band) P-1dB: 15.5dBm OIP3: 29 dBm 50Ohm input and output + 3V / 35mA SOT-89 plastic package

Electrical performance parameters (TA = +25°C, Vd = +3V, 50Ω system)

Index	Test Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Range		80		3000	MHz
Test frequency			1000		MHz
Small Signal Gain			15.5		dB
Input return loss			15		dB
Output return loss			17		dB
P-1			15.5		dBm
OIP3	Pout = 0 dBm/tone , Δf = 1 MHz		29.5		dBm
Noise Figure*	Without de-embedding, the estimated evaluation board loss is 0.15dB@1.0G		1.5		dB
Current			35		mA

*The noise figure result deducts the input loss of the test DEMO board .

Add: 101 cecil street #14-10, tong eng building singapore 069533
Email: info@standardcircuit.com
Web: www.standardcircuit.com
Tel: +65 82613258

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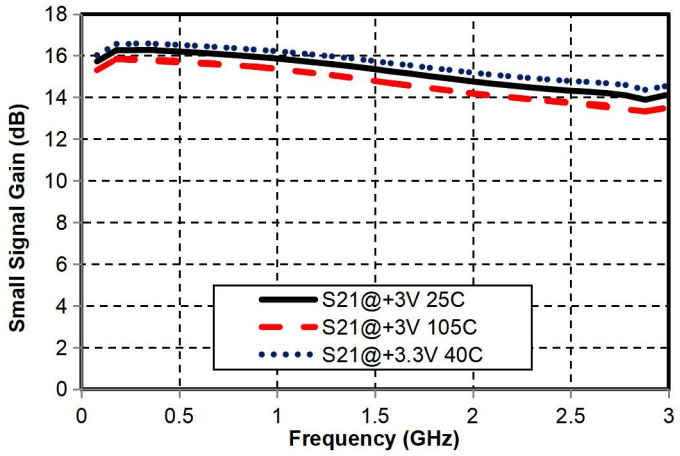
80M-3000M electrical performance parameters

Electrical performance parameters (TA = +25°C, Vd = +3V, 50Ω system, 35mA)									
Index	Typical Value								Unit
Test frequency	200	400	900	1900	2140	2450	2650	3000	MHz
Small Signal Gain	16.0	16.0	15.5	14.5	14.5	14.0	14.0	14.0	dB
Input return loss	15.0	16.0	15.0	13.0	13.0	13.0	13.0	16.0	dB
Output return loss	19.0	23.0	18.0	11.0	11.0	10.0	11.0	13.0	dB
P-1	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	dBm
OIP3*	30.0	30.0	29.5	29.0	29.0	29.0	30.0	30.0	dBm
Noise Figure**	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	dB

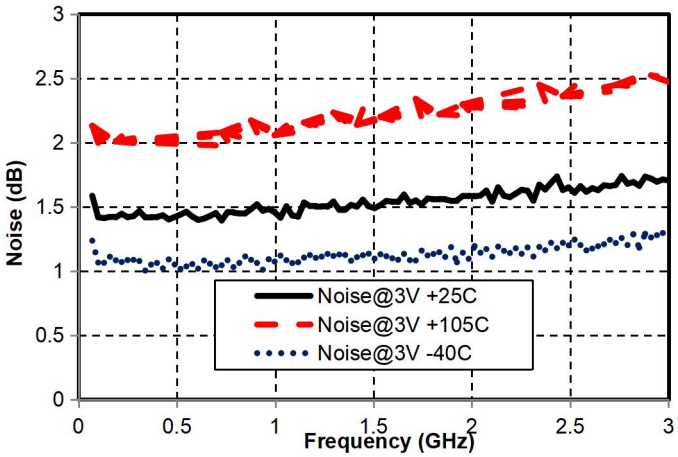
* Pout=+ 0 dBm/tone; Δf =1MHz .

** The noise figure result deducts the input loss of the test DEMO board.

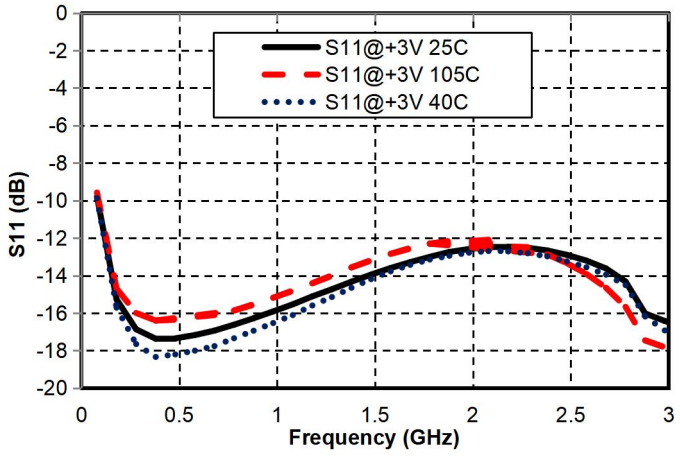
Small Signal Gain vs. Frequency



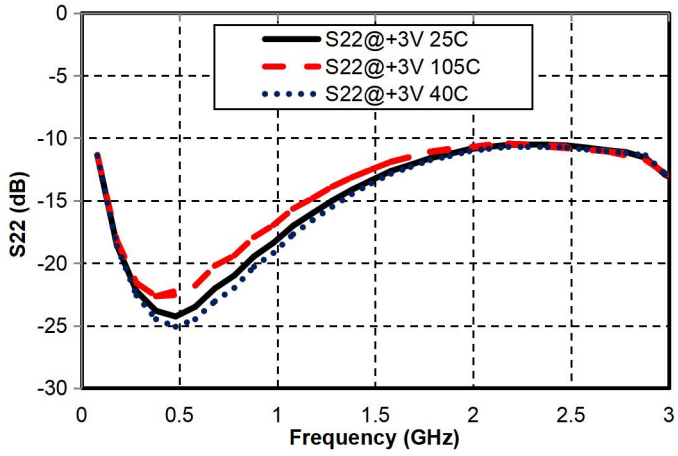
Noise Figure vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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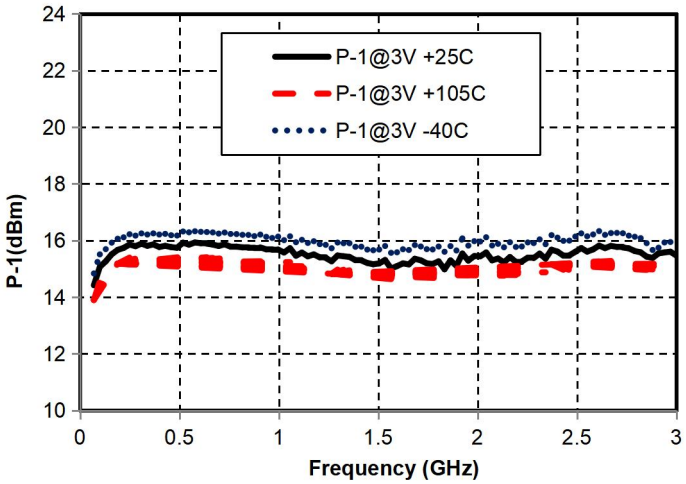
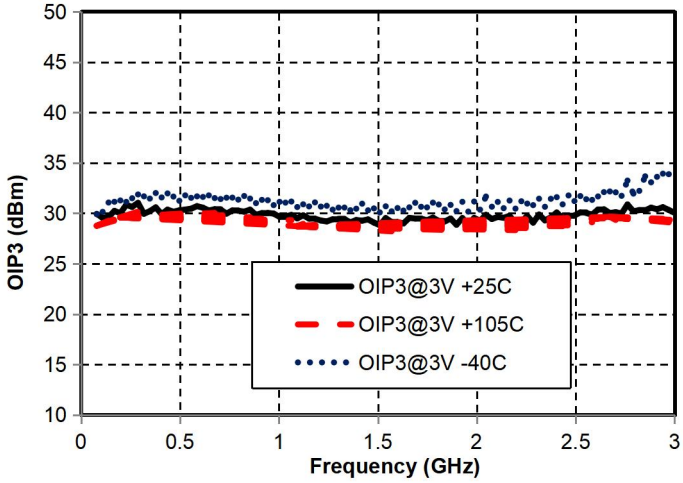
High Linearity Low Noise Gain Amplifier , 200 - 3000 MHz

P-1dB vs. Frequency



OIP3 vs. Frequency



GHLN-014A

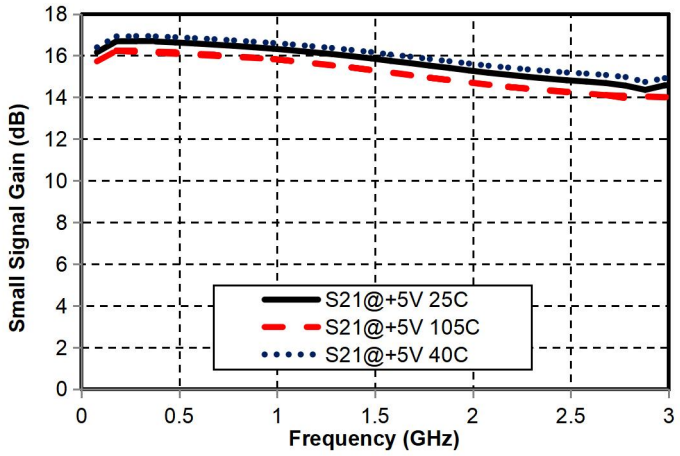
High Linearity Low Noise Gain Amplifier , 80 - 3000 MHz

80M-3000M electrical performance parameters (The following table is the test results of +5V, 65mA)

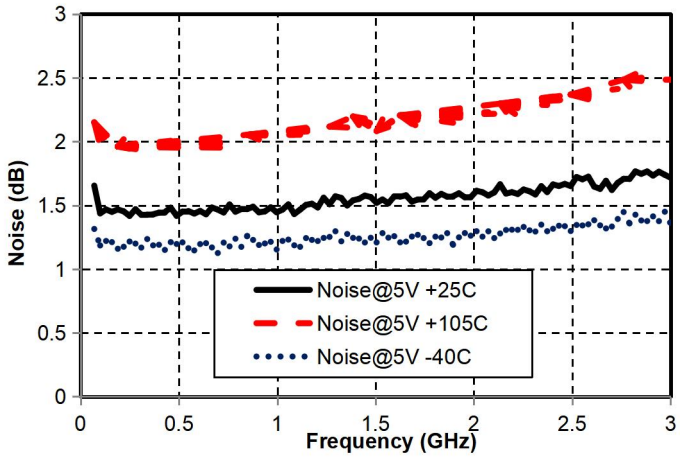
Electrical performance parameters (TA = +25°C, Vd = +5V, 50Ω system)									
Index	Typical Value								Unit
Test frequency	200	400	900	1900	2140	2450	2650	3000	MHz
Small Signal Gain	16.5	16.5	16.0	15.0	15.0	14.5	14.5	14.5	dB
Input return loss	16.0	19.0	17.0	13.0	13.0	13.0	14.0	17.0	dB
Output return loss	19.0	26.0	20.0	11.0	10.0	10.0	10.0	12.0	dB
P-1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.5	dBm
OIP3*	37.0	35.0	37.0	34.5	34.5	35.5	34.5	33.5	dBm
Noise Figure**	1.5	1.5	15.	1.6	1.7	1.7	1.7	1.7	dB

* Pout=+ 0 dBm/tone, Δf =1 MHz . ** Noise figure is the test data without de -embedding .

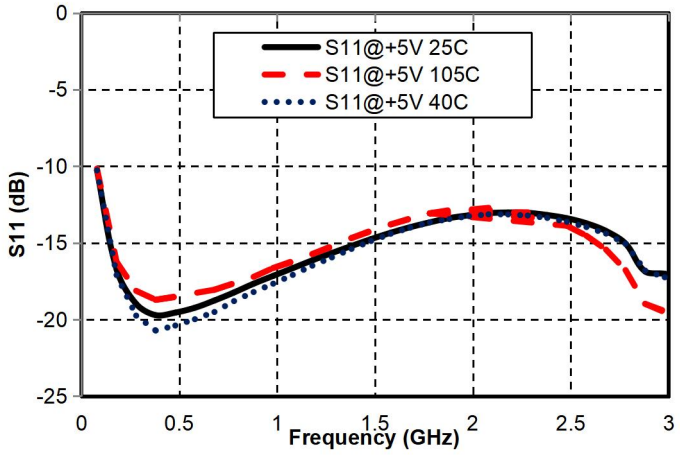
Small Signal Gain vs. Frequency



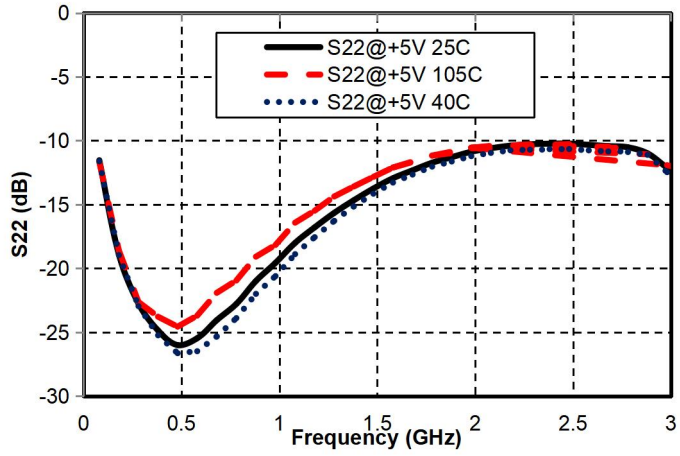
Noise Figure vs. Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



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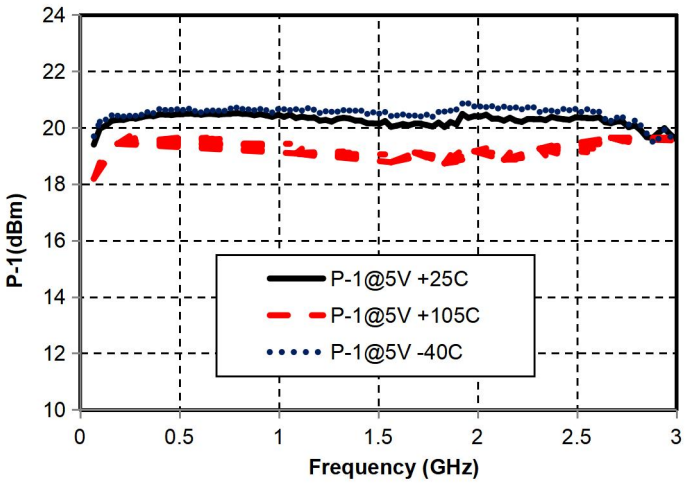
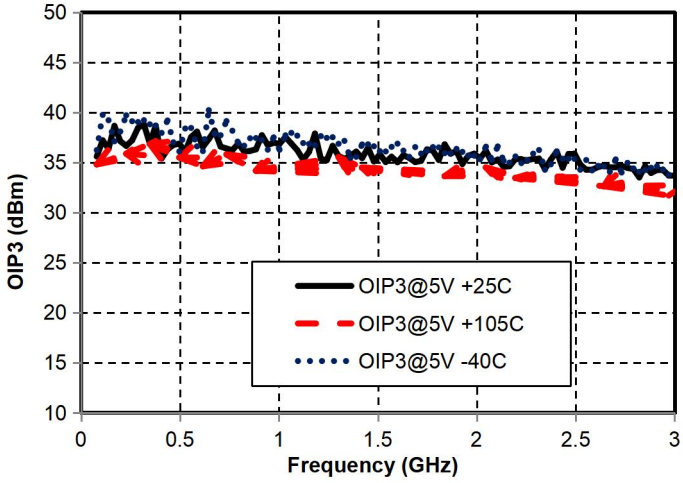
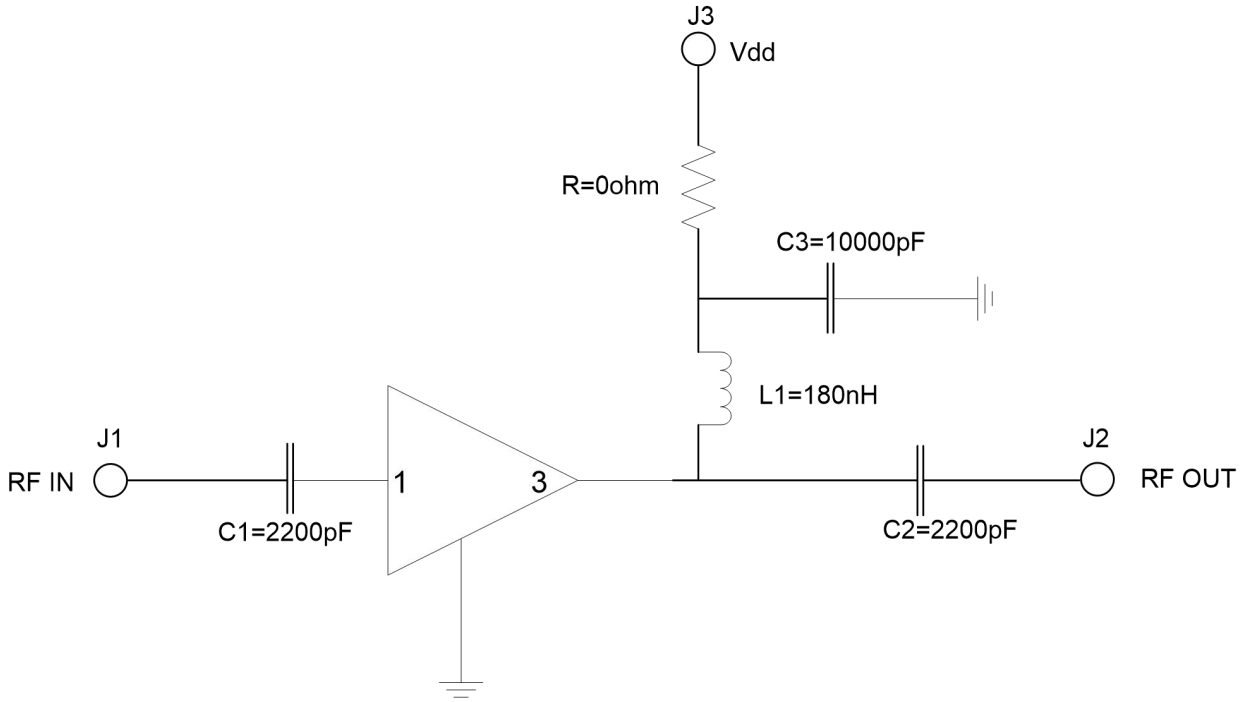
P-1dB vs. Frequency



OIP3 vs. Frequency



80M-3000M recommended circuit diagram



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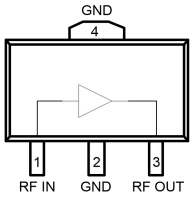
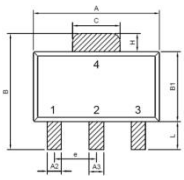
Pin Definition

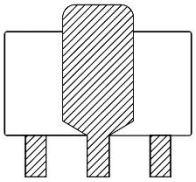


Bonding point number	Function Symbol	Functional Description
1	RF IN	RF input port, impedance 50ohm , requires external DC blocking capacitor
3	RF OUT / DC Bias	RF output port, impedance 50ohm, amplifier leakage bias, bias the circuit at the output end through external current-choking inductor and bias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

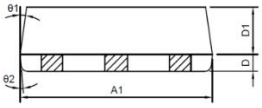
Appearance structure (SOT-89)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Annotation	Logo	MIN	NOM	MAX	Annotation	Logo	MIN	NOM	MAX
A	Colloid length	4.4	4.5	4.6	L	Foot length	0.85	1	1.2
A1	Lower colloid length	4.35	4.45	4.55	e	Foot spacing	1.4	1.5	1.6
A2	Foot width 1	0.4	0.5	0.6	D	Thick feet	0.3	0.39	0.45
A3	Foot width 2	0.43	0.53	0.63	D1	Thickness of upper colloid	1.05	1.1	1.15
B	span	4	4.2	4.4	C	Big feet wide	1.65	1.7	1.75
B1	Colloid width	2.4	2.5	2.6	θ1	Angular 1	6°	8°	10°
H	Big feet long	0.55	0.65	0.75	θ2	Angular 2	3°	5°	7°

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Use limit parameters	
Drain voltage: +7V	Input power: +20dBm
Maximum current: 120mA	Maximum junction temperature : 150 °C
Operating temperature: -40 ~ +105 ° C	Storage Temperature: -65 ~ +150°C
Exceeding any of these maximum limits may cause permanent damage.	

Exceeding any of these maximum limits may cause permanent damage.

Environmental conditions		
Parameter	Grade	Standard
ESD – Human Body Model (HBM)	1 B	ESDA / JEDEC JS-001-2014
ESD – Charged Device Model (CDM)	C3	ESDA / JEDEC JS-001-2014
MSL – Moisture Sensitivity Level	MSL 3	IPC/JEDEC J-STD-020

Precautions for use

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

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