CWA134SP4

V0.1

Low noise broadband amplifier

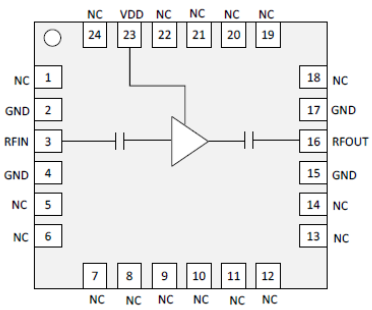
Performance characteristics

- Wide bandwidth: 17GHz~28GHz
- Low noise: 1.9dB typical
- Small signal gain: 23dB
- Output P1dB: 14dBm
- Output IP3: 25dBm
- Package size: 4*4mm 24-pin QFN

Typical application

- Point-to-point communication
- Point-to-multipoint communication
- Instruments and meters

Functional block diagram



Overview

The CWA134SP4 is a 17GHz ~ 28GHz low noise broadband amplifier manufactured using GaAs process. The amplifier has self-bias function, and the input and output terminals match the load with 50 Ω. This device can be used as local oscillator driver of mixer.

Electrical performance table (TA=+25 ℃, VD=4V, IDD=86mA)

Parameter name	Describe	Minimum value	Typical value	Maximum value	Unit
Operating frequency	Ferq		17～28		GHz
Gain	S21		23		dB
Input return loss	S11		-13		dB
Output return loss	S22		-15		dB
Reverse isolation	S12		-50		
Output power 1dB compression point	P1dB		14		dBm
Output IP3	Pout = 3dBm/tone, Δ f = 1 MHz		25		dBm
Saturated power	P3dB		16.8		dBm
Noise figure	NF		1.9		dB
Operating current	ID		86		mA
Operating voltage	VD		4		V

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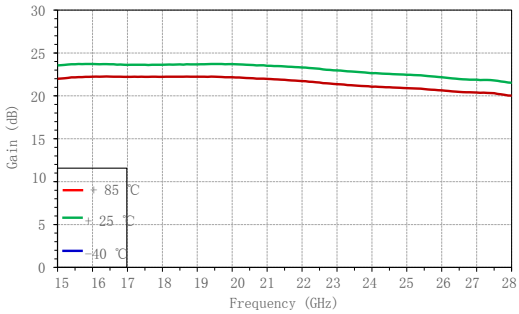
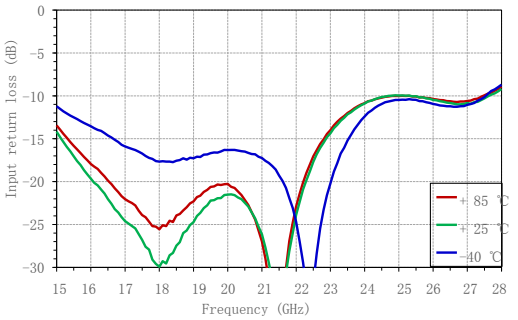
Test curve

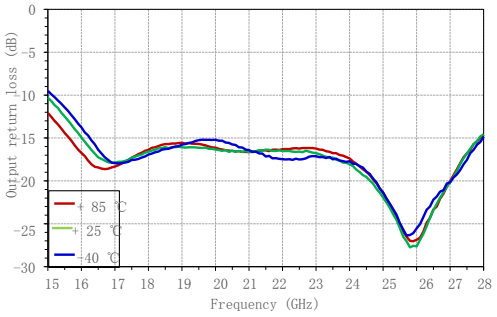
Gain and frequency



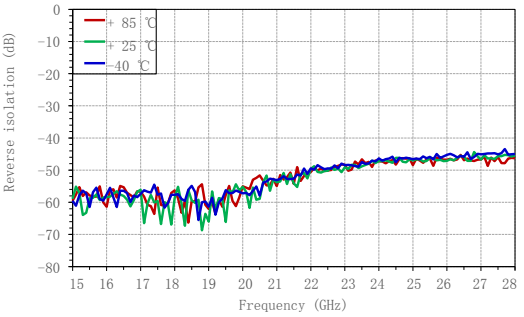
Input return loss VS frequency



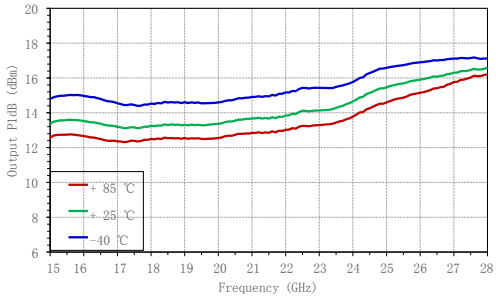
Output return loss VS frequency



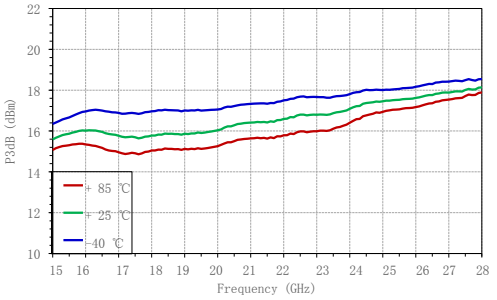
Reverse isolation VS frequency



P1dB VS frequency



P3dB VS frequency



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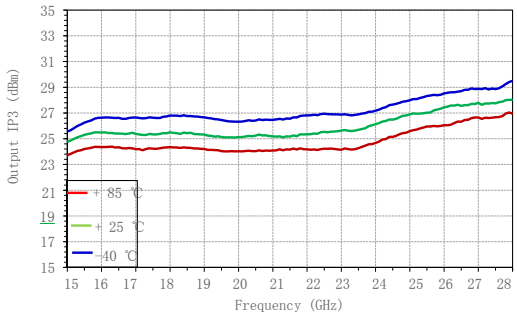
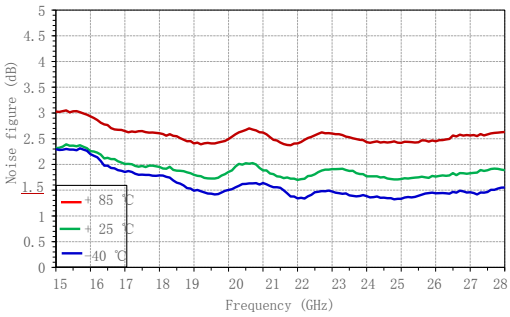
Test curve

Output IP3 and frequency



Noise figure VS frequency



Operating parameters

Operating temperature	-40 ~ + 85 ℃
Bias voltage VD	4V

Absolute maximum rating

Input power	14dBm
Storage temperature	-65 ℃ ~ + 150 ℃
Bias voltage VD	5V
ESD-HBM	250V

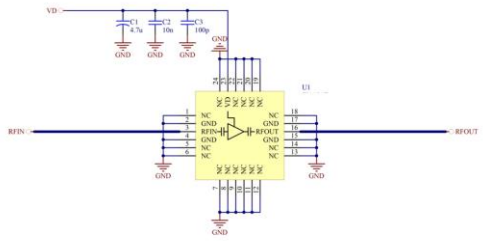
Encapsulation information

Model	Packaging material	Pad coating	MSL Rank [1]	Package ID [2]	Environmental protection requirements
CWA134SP4	Green resin compound	NiPdAuAg	MSL 3	S134 XXXXX	RoHS compliant

[1] Maximum reflow soldering temperature 260 ℃

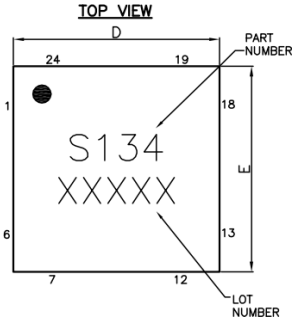
[2] XXXXX is the batch number

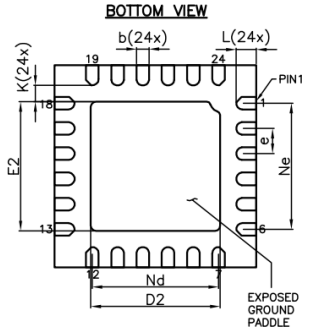
Recommended application diagram

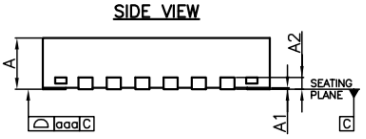


CWA Amplifier series

Overall dimensions







Description:

1. Unit: mm

2. Lead frame material: copper alloy

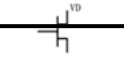
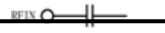
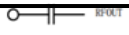
3. Package surface warpage: ≤ 0.05 mm

4. Connect all ground pins to PCB RF ground

SP4 Dimension Table (unit:mm)

Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.20Ref	
b	0.18	0.25	0.30
D	3.90	4.00	4.10
D2	2.41	2.56	2.66
e		0.50BSC	
Ne		2.50BSC	
Nd		2.50BSC	
E	3.90	4.00	4.10
E2	2.41	2.56	2.66
K	0.20	---	---
L	0.30	0.40	0.50
aaa		0.08	

Pin definition

Pin number	Functional symbol	Functional description	Schematic schematic diagram
1, 5-14, 18-22, 24	NC	Internal connectionless	
2, 4, 15, 17	GND	RF, so is the exposed paddle at the bottom of the package RF & DC radio frequency ground	
23	VD	Power port supply + 4V	
3	RF IN	RF input port with internal DC blocking capacitor	
16	RF OUT	RF output port with internal DC blocking capacitor	

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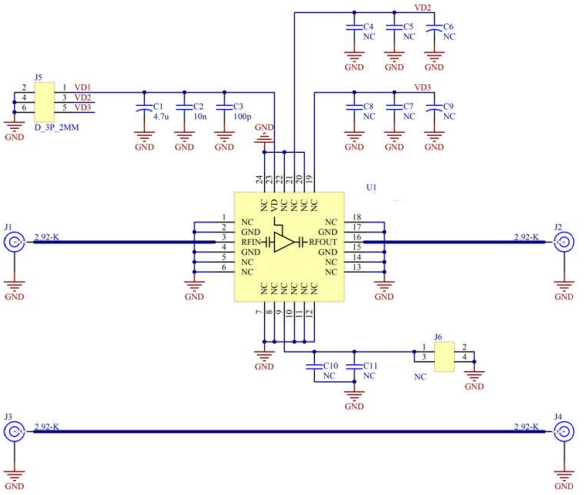
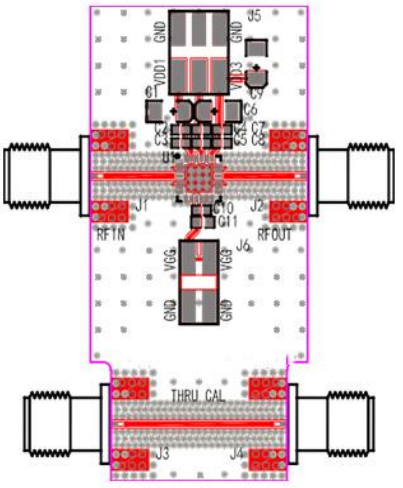
Evaluation board circuit diagram





Designator	Description
C1	Tantalum capacitor 1206 4.7 uF
C2	Multilayer Ceramic Capacitor 0402 10nF
C3	Multilayer Ceramic Capacitor 0402 100pF
J1, J2	2.92-K PCB Connector
J5	2.0 mm DC Pin
U1	CWA134SP4
J1 and J2 recommend Nanjing Aowen D360B12E01-023 2.92-K connection Connector	
NC means that ports are not used or the device is not soldered. The NC port of the chip can be connected to GND externally.	