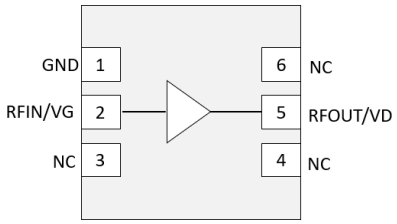
Performance Features

- Broadband width: 0.01GHz~10GHz
- Low noise: 1.4dB typical
- Small signal gain: 15dB
- Output P1dB: 20dBm
- Output IP3: 35dBm
- Package size: 2mm*2mm

Typical Applications

- 5G
- Point-to-Point Communication
- Instrumentation

Functional Block Diagram



Overview

The CWA069SP2 is a 0.01GHz~10GHz low noise broadband amplifier, manufactured in GaAs process. The input and output are 50Ω matched load. The device can be used as a local oscillator driver for mixers.

Electrical performance table (TA=+25℃)

Parameter Name	Description	Minimum value	Typical values	Maximum value	Unit
Operating frequency		0.01~10			GHz
Gain		10	15	20	dB
Input Return Loss			-14		dB
Output Return Loss			-14		dB
Output power 1dB compression point			20		dBm
Saturation power			22		dBm
Output IP2			42		dBm
Output IP3			35		dBm
Noise factor			1.4		dB
Single-sideband phase noise (100KHz frequency bias)			-155		dBc/Hz
Operating current			**65***		mA
Operating Voltage			5		V

*For testing, adjust the gate voltage VG from -2V to 0V to obtain an operating current (IDD) of 65mA typical.

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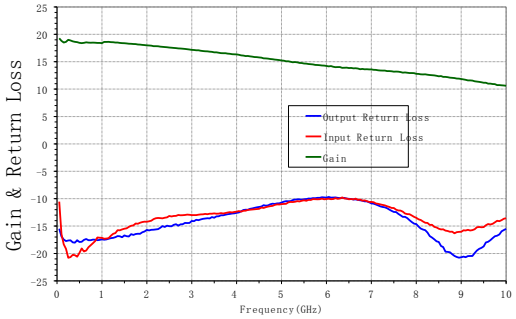
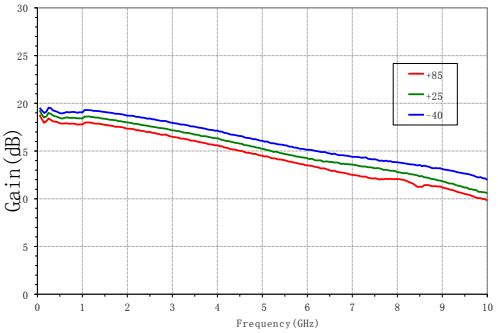
Test Curve

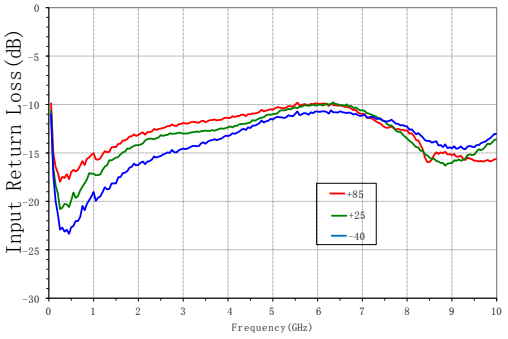
Gain and return loss



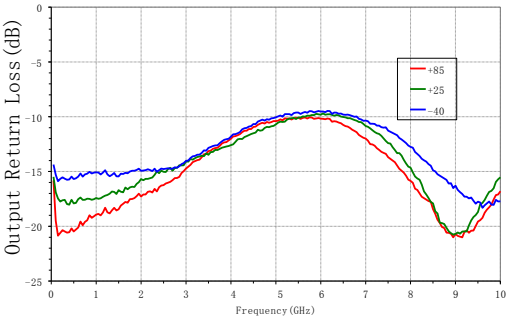
Gain



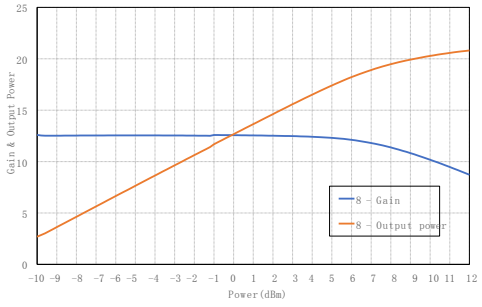
Input Return Loss



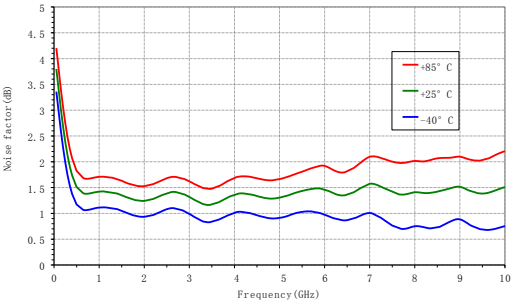
Output Return Loss



Gain & Output Power vs. Input Power(@8GHz)



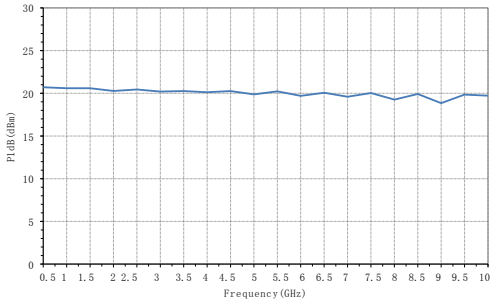
Noise factor vs. frequency



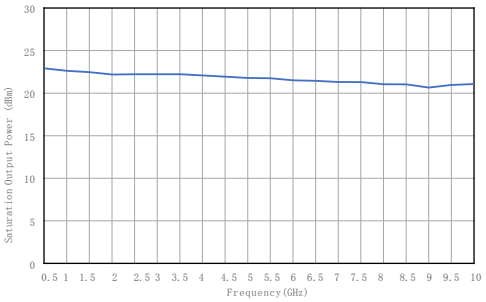
CWA Amplifier series

Test Curve

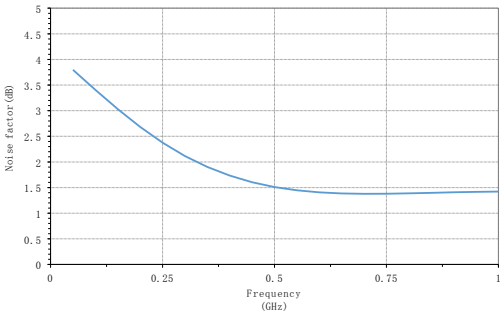
P1dB VS Frequency



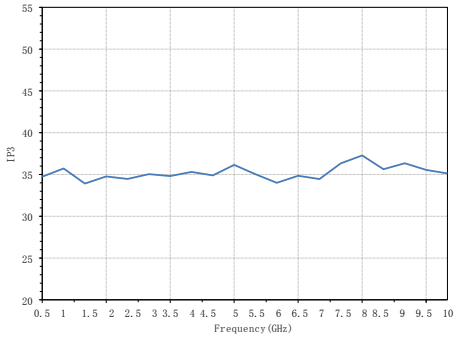
Saturated output power vs. frequency



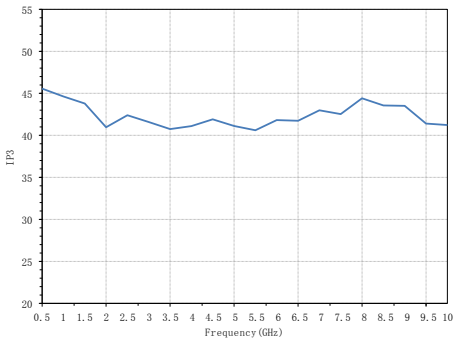
Noise factor vs. frequency (@0-1GHz)



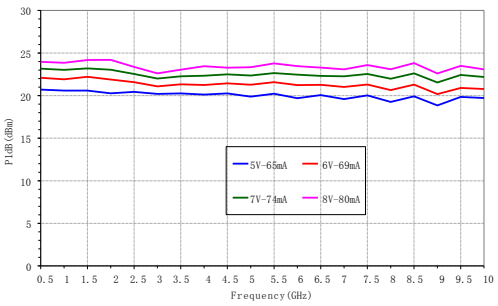
OIP3 VS Frequency (single-order output power @ 5dBm)



OIP2 VS Frequency (single-order output power @ 5dBm)



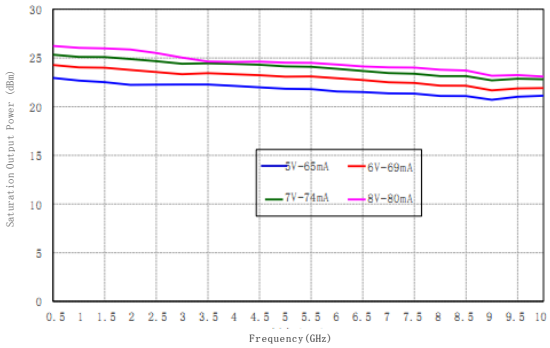
P1dB VS Frequency (VD=5V, 6V, 7V, 8V)



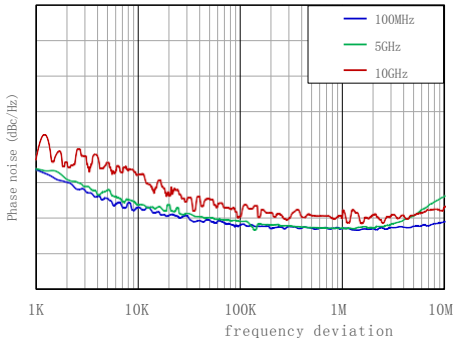
CWA Amplifier series

Test Curve

Saturation output power VS frequency
(VD=5V, 6V, 7V, 8V)



Phase noise vs. frequency bias (input power of -10dBm)



Working parameters

Operating temperature	-40℃～+85℃
Bias voltage VD/OUT	5V

Absolute maximum rating

Storage temperature	-65℃～+150℃
Bias voltage VD/OUT	9V
ESD-HBM	TBD

Package Information

Model	Packaging materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWA069SP2	Green resin compounds	NiPdAu	MSL 1	S069 XXXXX	RoHS compliant

[1] Maximum reflow temperature 260° C

[2] XXXXX is the lot number

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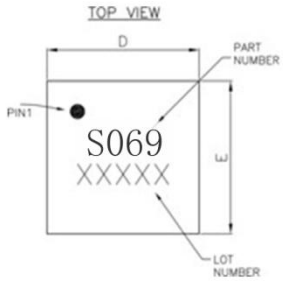
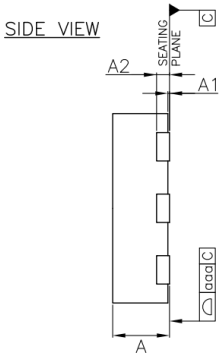
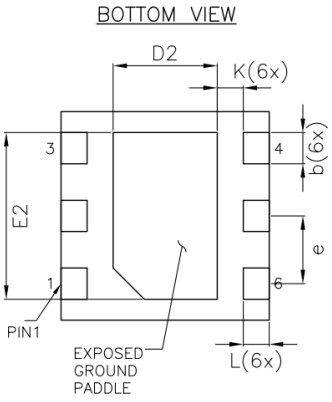
Dimension







Description:

1. Unit: mm
2. Lead frame material: copper alloy
3. Package surface warpage: not more than 0.05mm
4. All ground pins please connect PCB RF ground

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	0.25	0.30	0.35
D	1.95	2.00	2.05
D2	0.85	1.00	1.10
e		0.65BSC	
E	1.95	2.00	2.05
E2	1.45	1.60	1.70
K	0.20	---	---
L	0.20	0.25	0.30
aaa		0.08	

Pin Definition

Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	GND	RF Ground	4	NC	Vacant
2	RFIN/VG	RF input, gate voltage	5	RFOUT/VD	RF output, leakage voltage
3	NC	Vacant	6	NC	Vacant

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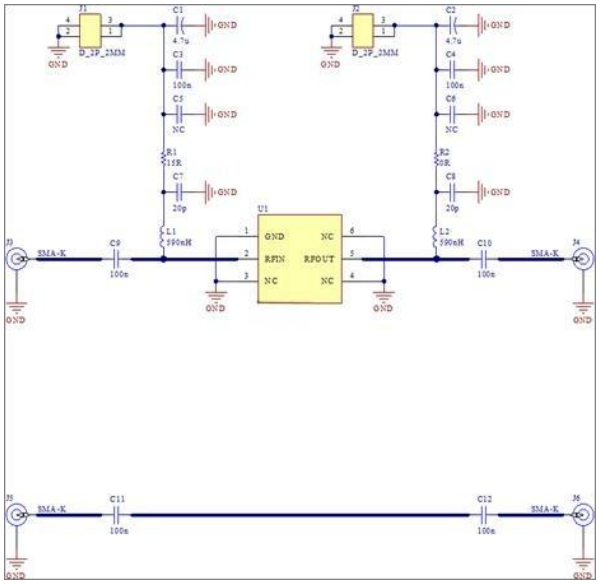
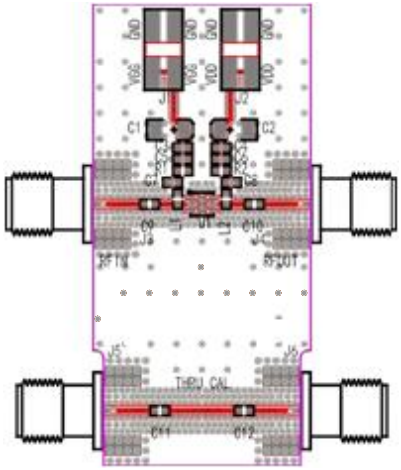
Evaluation Boards





Circuit board material: Rogers 4350B

The circuit board for the device application should be designed in accordance with the RF circuit design method, with the signal line designed for 50 ohm impedance, and the ground pin of the package housing grounded nearby (similar to the figure), with sufficient ground holes connecting the top and bottom ground layers.

Designator	Description
C1, C2	4.7uF Tantalum Capacitor 1206C
C3, C4	100nF Ceramic Capacitor 0402
C7, C8	20pF Ceramic Capacitor 0402
C9, C10	100nF Ceramic Capacitor 0402
C11, C12	100nF Ceramic Capacitor 0402
J1, J2	2pin 2mm DC pins
L1, L2	590nH inductor 0402
R1	15R Resistor 0402
R2	0R Resistor 0402
J3, J4, J5, J6	SMA-K connector Nanjing Aowen D550B12E01-048
U1	CWA069SP2
J1, J2, J3 are recommended to use Nanjing Aowen D550B12E01-048 SMA connector	