

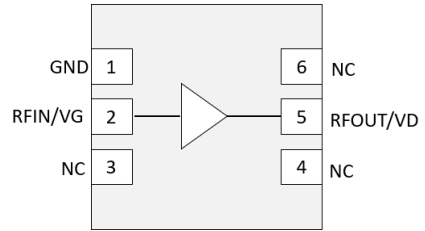
Performance Features

- Broadband width: 0.01GHz~8GHz
- Low noise: 1.4dB typical
- Small signal gain: 19dB
- Output P1dB: 20.5dBm
- Output IP3: 34dBm
- Package size: 2mm*2mm

Typical Applications

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

Functional Block Diagram



Overview

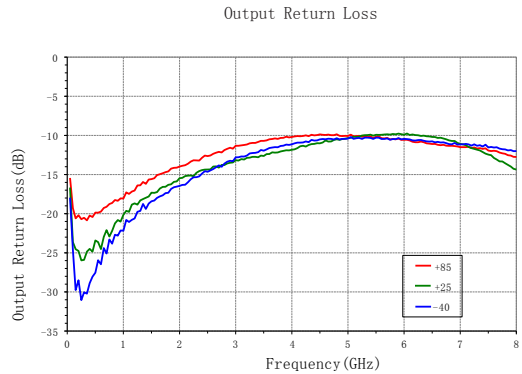
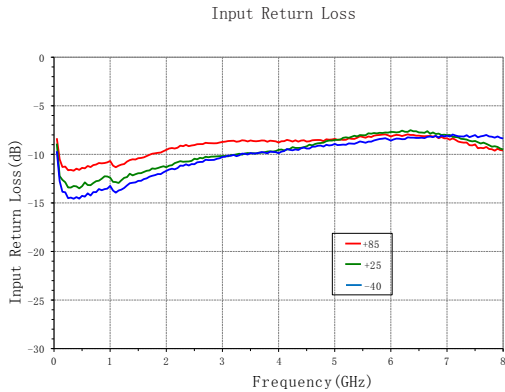
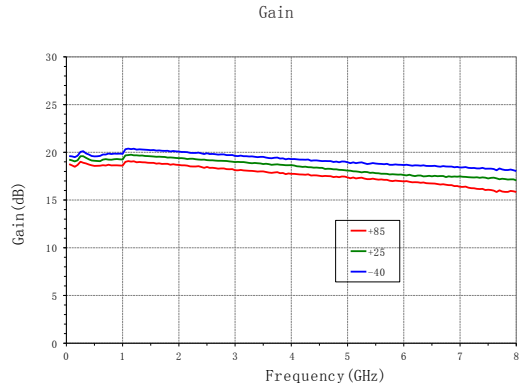
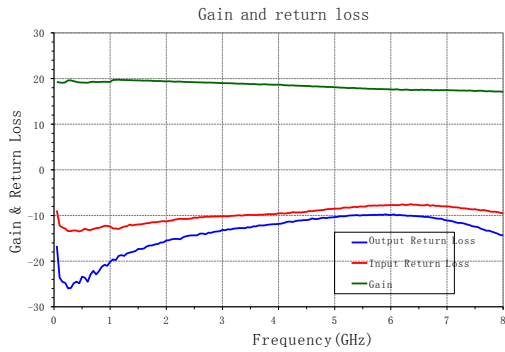
The CWA068SP2 is a 0.01GHz~8GHz low-noise broadband amplifier manufactured in GaAs process. The input and output terminals are 50Ω matched load. The device can be used as a local oscillator driver for mixers.

Electrical performance table (TA= +25°C)

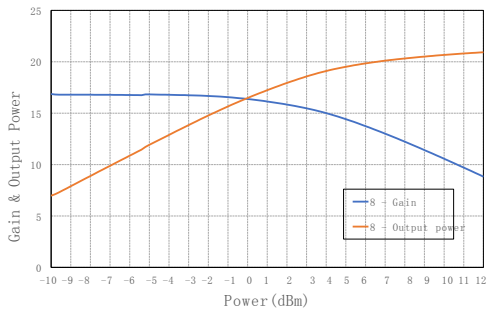
Parameter Name	Description	Minimum value	Typical values	Maximum value	Unit
Operating frequency		0.01~8			GHz
Gain		16	19	21	dB
Gain Flatness			±1		dB
Input Return Loss			-10		dB
Output Return Loss			-14		dB
Output power 1dB compression point			20.5		dBm
Saturation power			22.5		dBm
Output IP2			43		dBm
Output IP3			34		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.

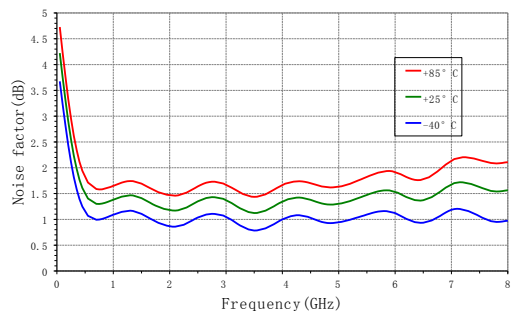
Test Curve



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



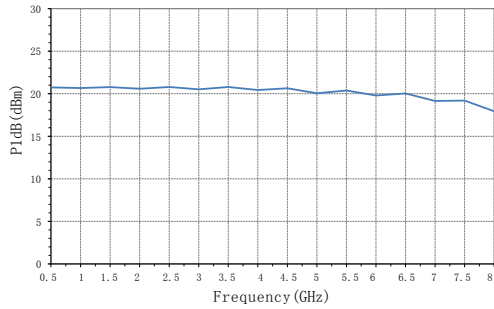
Noise factor vs. frequency



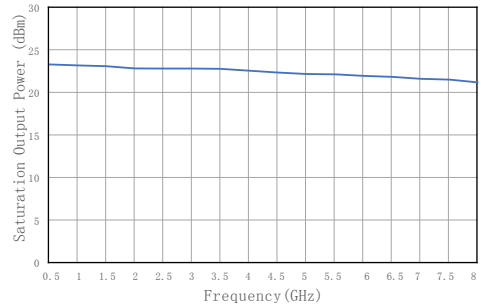
CWA
Amplifier
Series

Test Curve

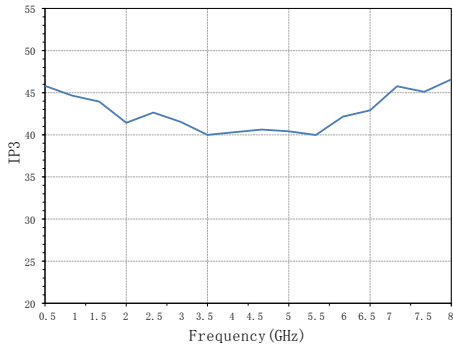
P1dB VS Frequency



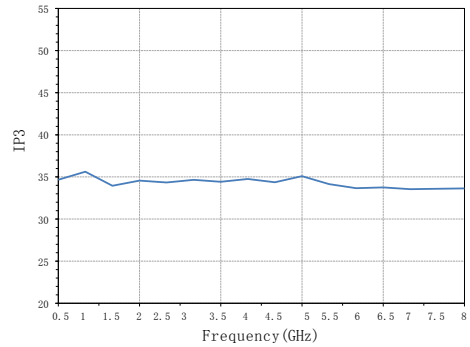
Saturated output power vs. frequency



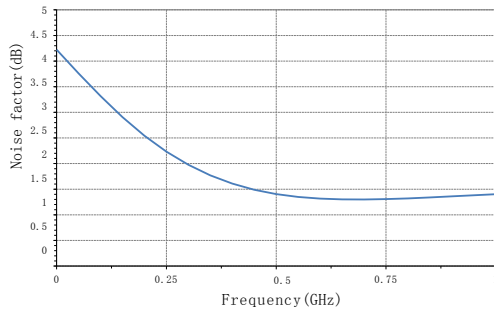
OIP2 VS Frequency (single-order output power @ 5dBm)



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



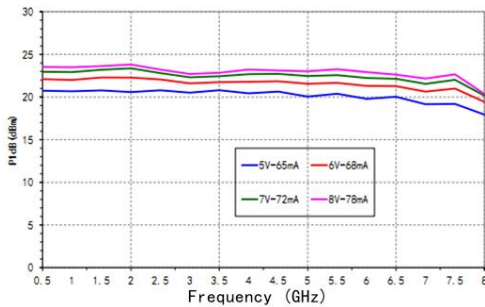
Noise factor vs. frequency (@0-1GHz)



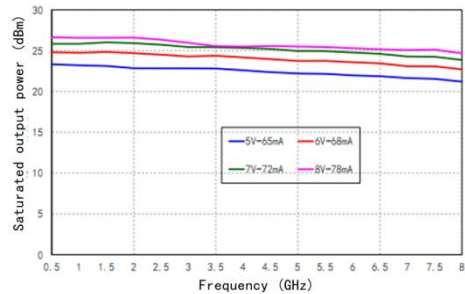
CWA
Amplifier
Series

Test Curve

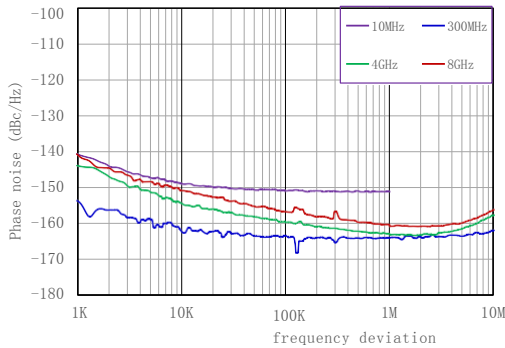
P1dB VS Frequency (VD=5V, 6V, 7V, 8V)



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



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



Working parameters

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

Absolute maximum rating

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

Package Information

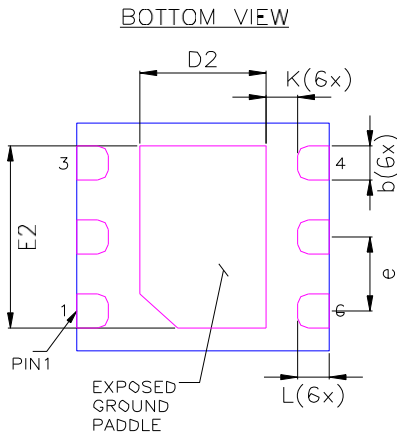
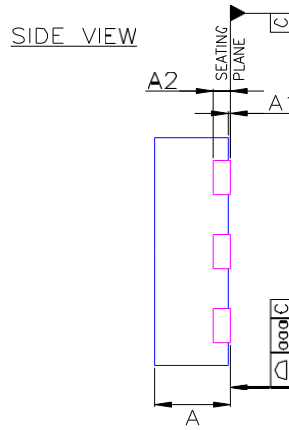
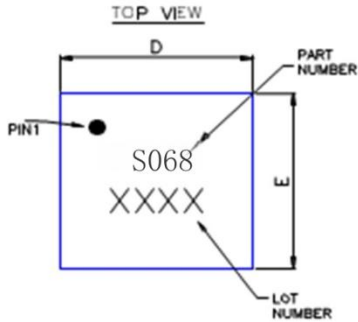
Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWA068SP2	Green resin compounds	NiPdAu	MSL 3	S068 XXXXX	RoHS compliant

[1] Maximum reflow temperature 260° C

[2] XXXXX is the lot number

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

Package Form Factor

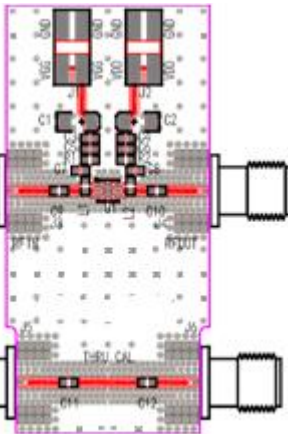
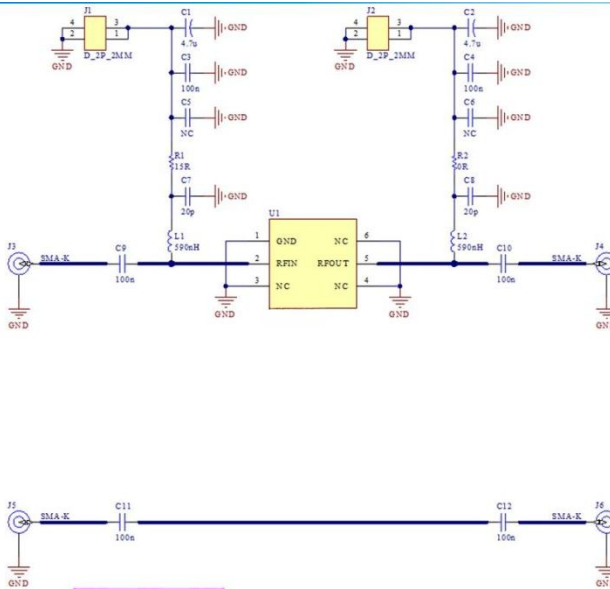


Dimension Table (unit:mm)			
Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.20Ref		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D2	0.85	1.00	1.10
e	0.65BSC		
E	1.95	2.00	2.05
E2	1.45	1.60	1.70
K	0.20	---	---
L	0.20	0.25	0.30
aaa	0.08		

Pin Definition

Pin Number	Function Symbols	Function Description
1	GND	RF's
2	RF IN/VG	RF input/gate-voltage port with no internal isolation capacitors
3	NC	NC
4	NC	NC
5	RFOUT/VD	RF output/drain port, no internal isolation capacitors on chip
6	NC	NC

Evaluation Boards



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	CWA068SP2
J1, J2, J3 are recommended to use Nanjing Aowen D550B12E01-048 SMA connector	

Circuit board material: Rogers 4350B

The circuit board of the device application should be designed according to the RF circuit design method, the signal line should be designed according to the 50 ohm impedance, and the ground pin of the package shell should be grounded nearby (similar to the figure), and there should be enough grounding holes to connect the top and bottom ground layers.