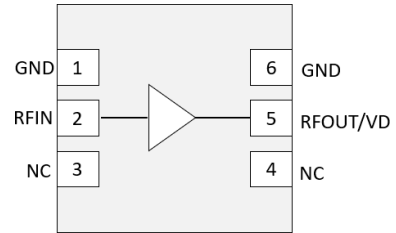


Performance Features

- Broadband width: 0.01GHz~10GHz
- Low noise: 1.8dB typical
- Small signal gain: 14.5dB
- Output P1dB: 19dBm
- Output IP3: 35dBm
- Package size: 2mm*2mm

Typical Applications

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

Functional Block Diagram

Overview

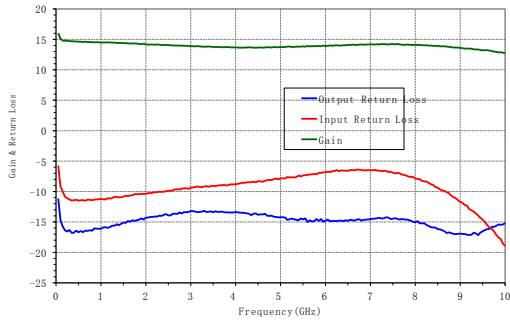
The CWA070SP2 is a 0.01GHz~10GHz low-noise broadband amplifier manufactured using GaAs process. The amplifier is self-biased with 50Ω matched loads at the input and output. The device can be used as the fundamental driver of a mixer.

Electrical performance table (TA=+25°C)

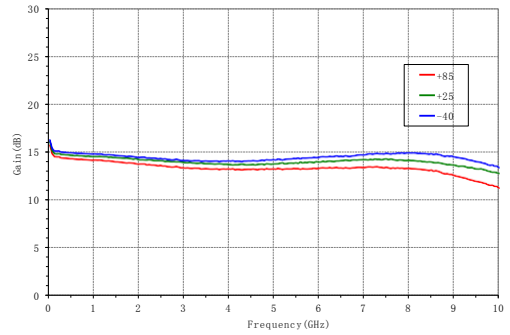
Parameter Name	Minimum value	Typical values	Maximum value	Unit
Operating frequency	0.01~10			GHz
Gain	11	14.5	16	dB
Gain Flatness		±0.5		dB
Input Return Loss		-9		dB
Output Return Loss		-15		dB
Output power 1dB compression point		19		dBm
Saturation power		21		dBm
Output IP2		42		dBm
Output IP3		35		dBm
Noise factor		1.8		dB
Single-sideband phase noise (100KHz frequency bias)		-155		dBc/Hz
Operating current		65		mA
Operating Voltage		5		V

Test Curve

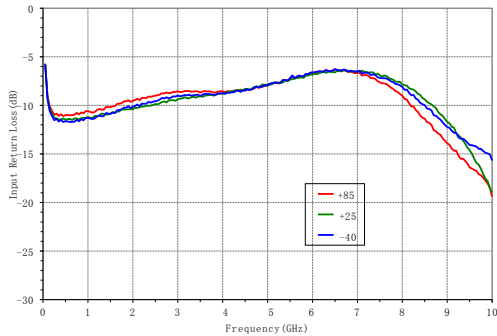
Gain and return loss



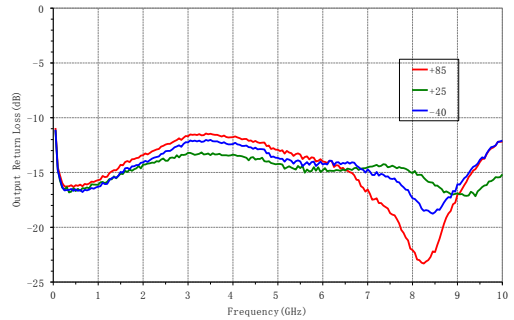
Gain



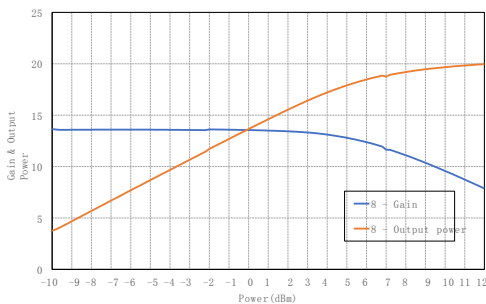
Input Return Loss



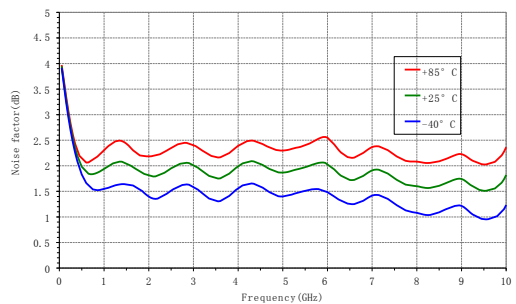
Output Return Loss



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

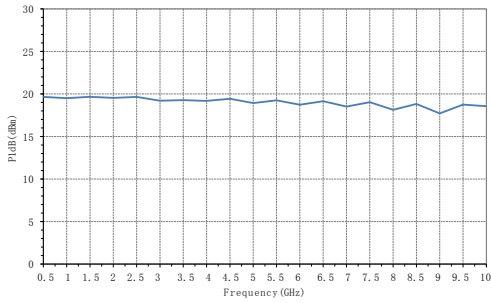


Noise factor vs. frequency

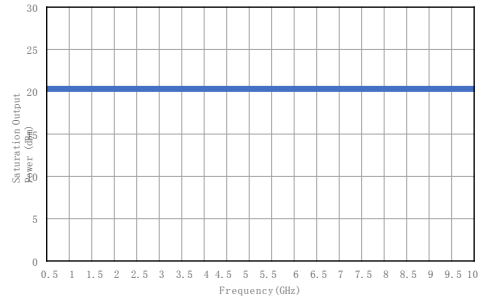


Test Curve

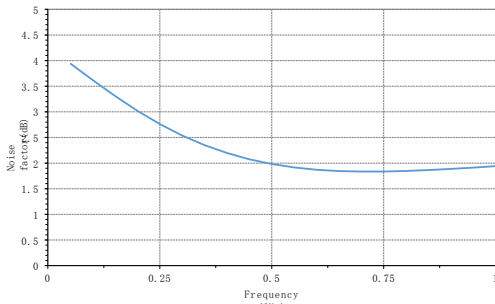
P1dB VS Frequency



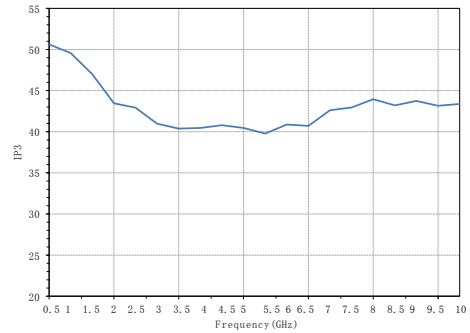
Saturated output power vs. frequency



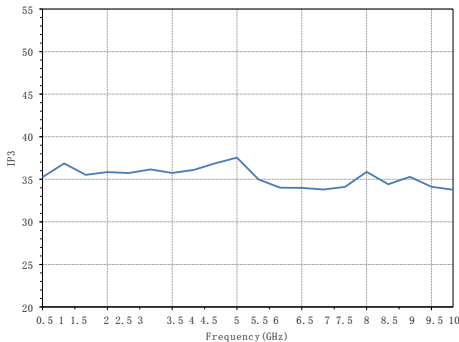
Noise factor vs. frequency (@0-1GHz)



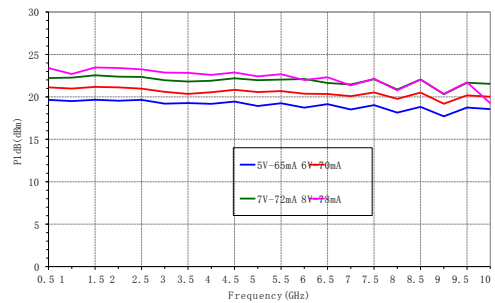
OIP2 VS Frequency (single-order output power @ 5dBm)



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

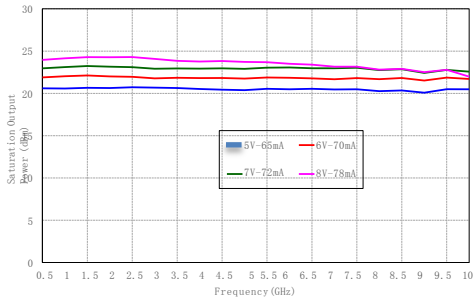


P1dB VS Frequency (VD=5V, 6V, 7V, 8V)

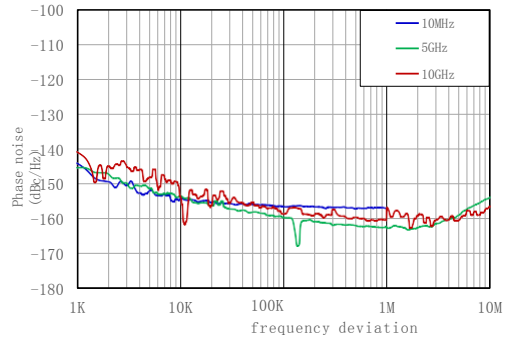


Test Curve

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



Phase noise vs. frequency bias
(input power -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

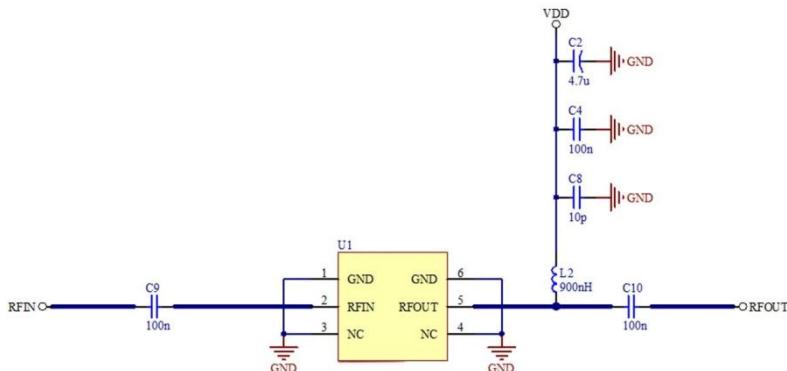
Package Information

Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWA070SP2	Green resin compounds	NiPdAu	MSL 3	S070 XXXXX	RoHS compliant

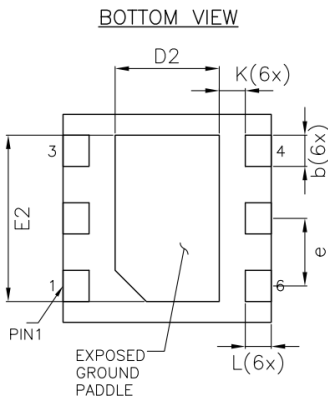
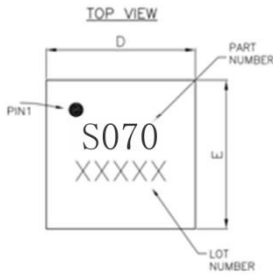
[1] Maximum reflow temperature 260° C

[2] XXXXX is the lot number

Typical Application Diagram

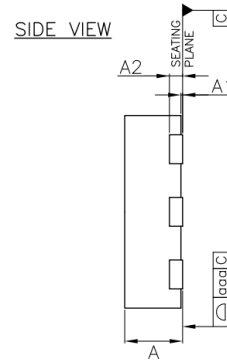


Dimension



Description:

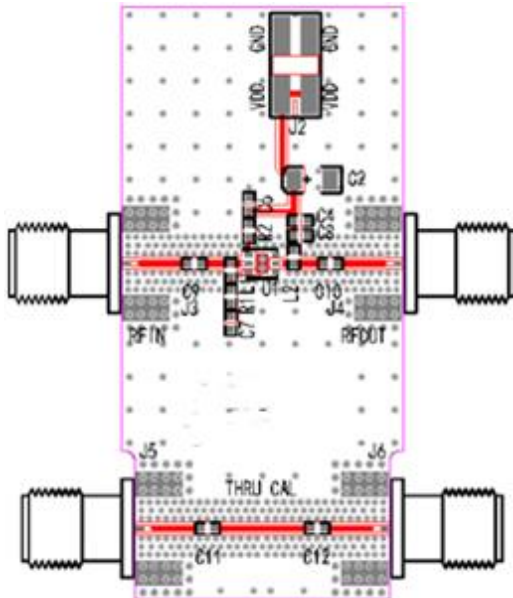
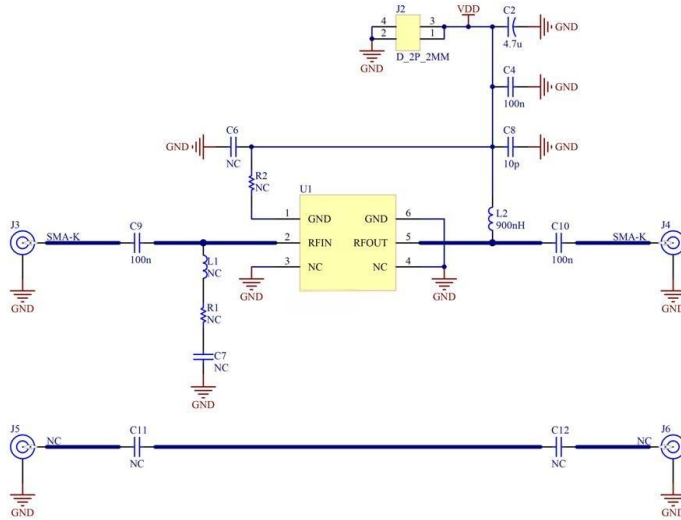
1. Unit: mm
2. Lead frame material: copper alloy
3. Package surface warpage: not more than 0.05mm
4. All ground pins please connect PCB RF ground



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	RF input	5	RFOUT/VD	RF output, leakage voltage
3	NC	Vacant	6	GND	RF Ground



Designator	Description
C4, C9, C10	Multilayer Ceramic Capacitor 0402 100pF
C2	Tantalum capacitor 1206 4.7uF
C8	Multilayer Ceramic Capacitor 0402 10pF
J3, J4	SMA-K PCB connectors
L2	Wirewound inductors 0402 900nH
J2	2.0mm DC pins
U1	CWA070SP2
J3, J4 are recommended to use Nanjing Aowen D550B12E01-023 type SMA-K with Connectors	
NC indicates that the port is not used or the device is not soldered. The outside of the chip NC port can be connected to GND.	
Chip PIN1 port is internally connected to GND, externally it can be suspended or connected GND.	