

Performance Features

- Broadband width: 22GHz~40GHz
- Low noise: 2.7dB typical
- Small signal gain: 20dB
- Output P1dB: 13dBm
- Output IP3: 23dBm
- Package size: 4*4mm 24-pin QFN

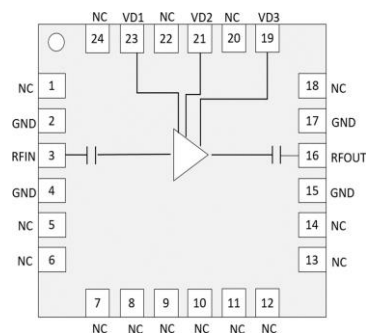
Overview

The CWA075SP4 is a 22GHz~40GHz 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 a local oscillator driver for mixers.

Typical Applications

- Point-to-Point Communication
- Point-to-Multipoint Communication
- Instrumentation

Functional Block Diagram

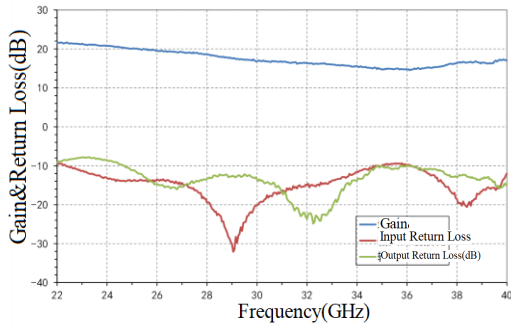


Electrical performance table (TA=+25°C)

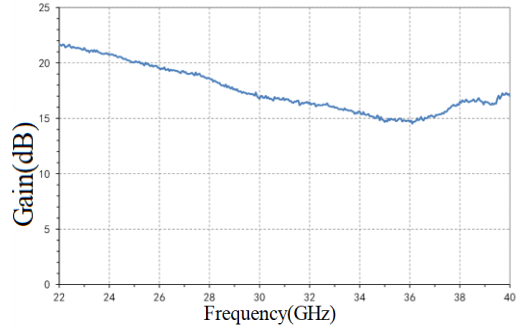
Parameter Name	Description	Minimum value	Typical values	Maximum value	Minimum value	Typical values	Maximum value	Unit	
Operating frequency		22~28			28~40			GHz	
Gain			20			16.5		dB	
Input Return Loss			-14			-15		dB	
Output Return Loss			-12			-15		dB	
Output power 1dB compression point			13			13		dBm	
Saturation power			15			15.5		dBm	
Output IP3			23			23		dBm	
Noise factor			2.5			2.7		dB	
Operating current		65							mA
Operating Voltage	VD1, VD2, VD3	3							V

Test Curve

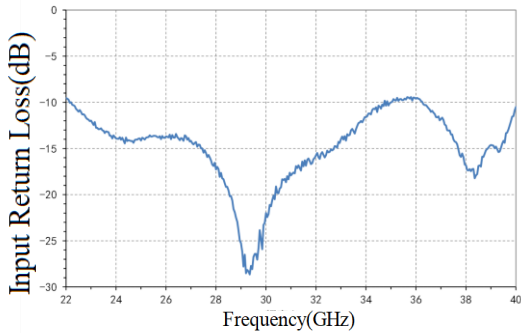
Gain and return loss



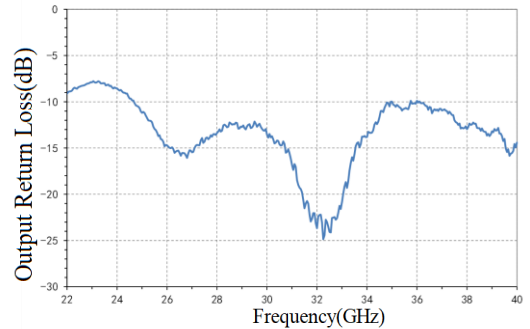
Gain vs. frequency



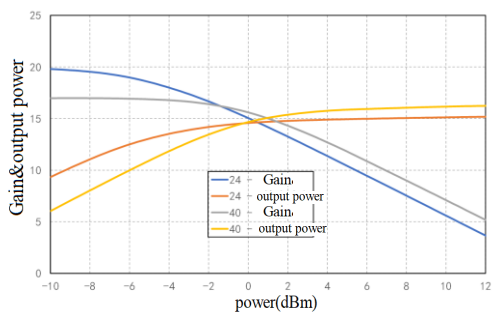
Input return loss vs. frequency



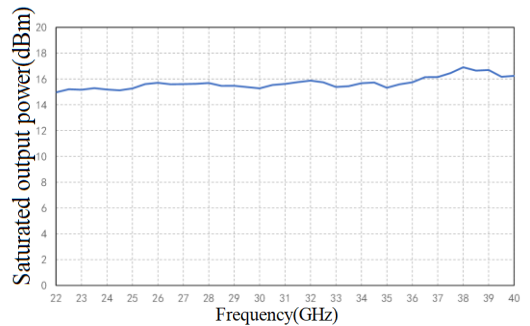
Output return loss vs. frequency



Gain & Output Power vs. Frequency

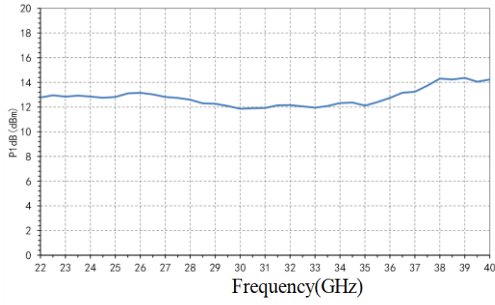


Saturation output power vs. frequency

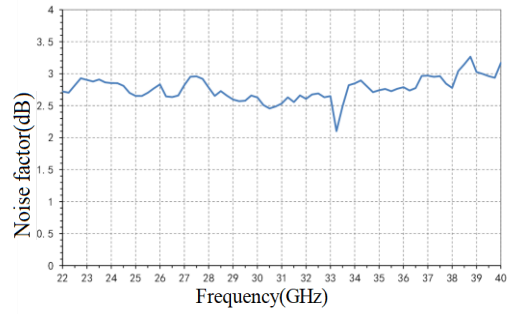


Test Curve

P1dB VS Frequency



Noise factor vs. frequency



Working parameters

Operating temperature	25°C
Bias voltage VD1, VD2, VD3	3V

Absolute maximum rating

Storage temperature	-65°C~+150°C
Bias voltage VD1, VD2, VD3	5V
ESD-HBM	TBD

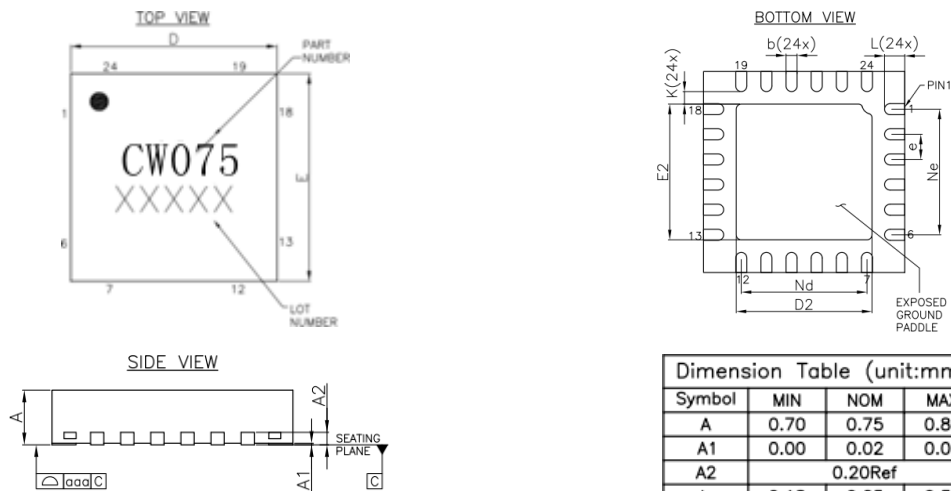
Package Information

Model	Packaging materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWA075SP4	Green resin compounds	NiPdAuAg	MSL 3	CW075 XXXXX	RoHS compliant

1 Maximum reflow temperature 260°C

2 XXXXX is the batch number

Dimension



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	2.55	2.70	2.80
e	0.50BSC		
Ne	2.50BSC		
Nd	2.50BSC		
E	3.90	4.00	4.10
E2	2.55	2.70	2.80
K	0.20	---	---
L	0.30	0.40	0.50
aaa	0.08		

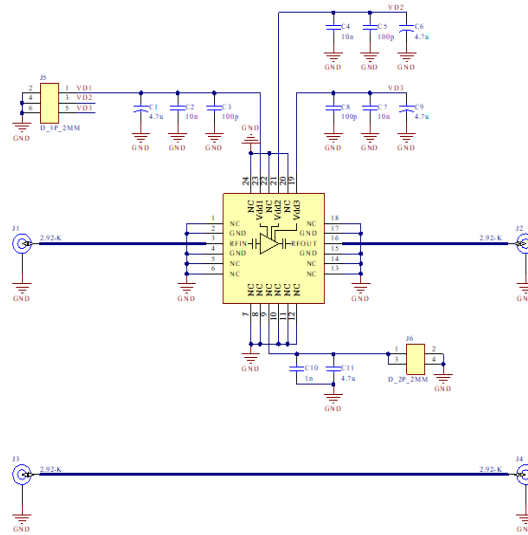
Description:

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

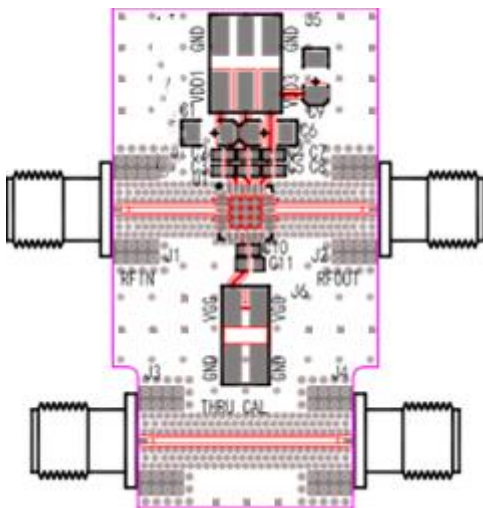
Pin Definition

Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	NC	Vacant	13	NC	Vacant
2	GND	RF Ground	14	NC	Vacant
3	RFIN	RF input	15	GND	RF Ground
4	GND	RF Ground	16	RFOUT	RF Output
5	NC	Vacant	17	GND	RF Ground
6	NC	Vacant	18	NC	Vacant
7	NC	Vacant	19	VD3	Leakage pressure3
8	NC	Vacant	20	NC	Vacant
9	NC	Vacant	21	VD2	Leakage pressure 2
10	NC	Vacant	22	NC	Vacant
11	NC	Vacant	23	VD1	Leakage pressure1
12	NC	Vacant	24	NC	Vacant

Evaluation Boards



Designator	Description
C1, C6, C9	4.7uF Tantalum Capacitor 1206C
C2, C4, C7	10nF Ceramic Capacitor 0402
C3, C5, C8	100pF Ceramic Capacitor 0402
C10, C11	100nF Ceramic Capacitor 0402
J5	3pin 2mm DC pins
J6	2pin 2mm DC pins
J1, J2, J3, J4	SMA-K connector Nanjing Aowen D550B12E01-048
U1	CWA075SP4
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.