

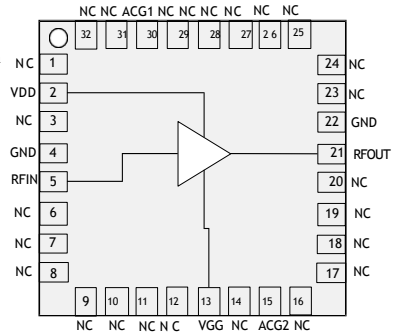
### Performance Features

- Wide Bandwidth: DC~24GHz
- Low noise: 2.7dB typical
- Small signal gain: 15dB typical
- Output P1dB: 15dBm typical
- Output IP3: 29dBm typical
- Package size: 5mm\*5mm 32-pin QFN

### Typical Applications

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

### Functional Block Diagram



### Overview

The CWA078SP5 is a DC~24GHz low-noise broadband amplifier manufactured using GaAs process. The amplifier has a broadband flat gain characteristic and 50Ω matched loads at the input and output.

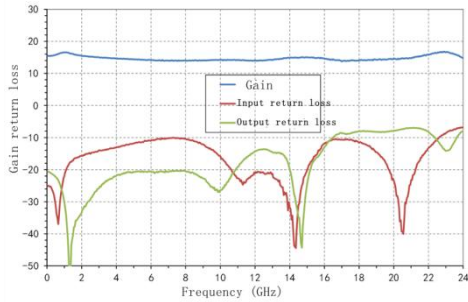
### Electrical performance table (TA=+25°C)

Parameter Name	Description	Minimum value	Typical values	Maximum value	Unit
Operating frequency		DC~24			GHz
Gain			15		dB
Gain Flatness			±0.8		dB
Input Return Loss			15		dB
Output Return Loss			15		dB
Output power 1dB compression point			15		dBm
Saturated output power			19		dBm
Output IP3			29		dBm
Noise factor			2.7		dB
Operating current			70		mA
Operating Voltage			7		V

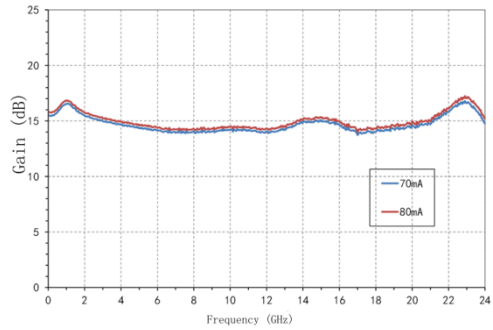
\*For testing, adjust the gate voltage VGG from -2V to 0V to obtain an operating current (IDD) of 70mA typical.

## Test Curve

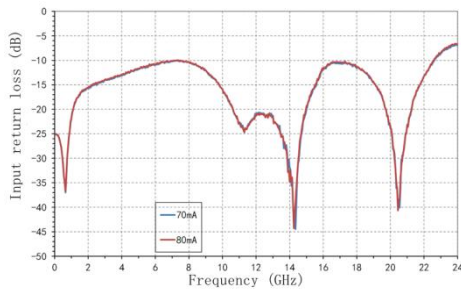
Gain &amp; Return Loss vs. Frequency



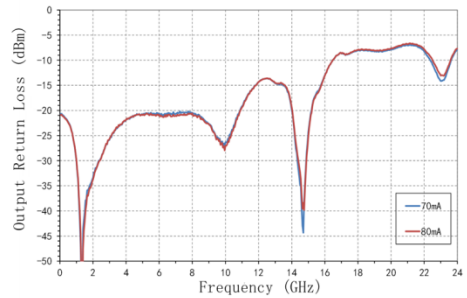
Gain vs. frequency



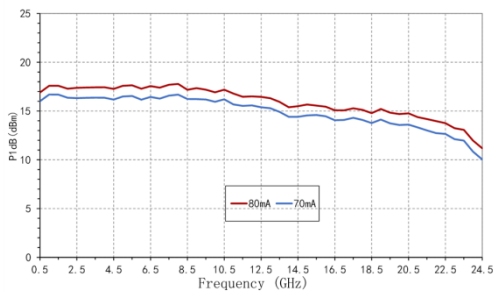
Input return loss vs. frequency



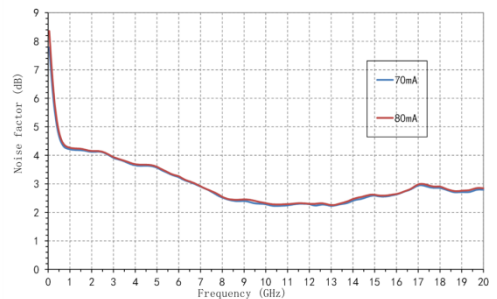
Output return loss vs. frequency



P1dB VS Frequency

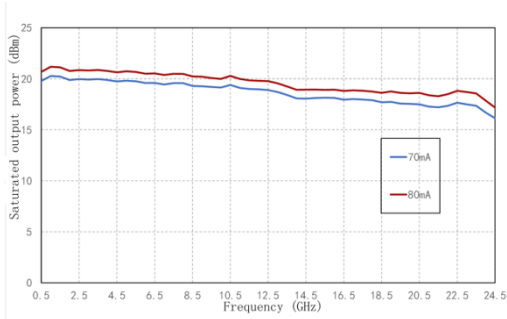


Noise factor vs. frequency

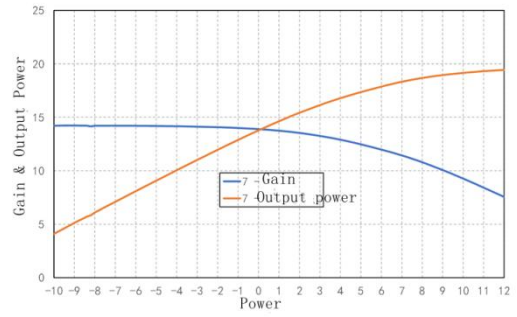


### Test Curve

Saturated output power vs. frequency



Gain & Output Power vs. Frequency



### Working parameters

Operating temperature	-40°C~+85°C
leakage pressure $V_{00}$	7V
Current $I_{00}$	55mA

### Absolute maximum rating

Storage temperature	-65°C~+150°C
leakage pressure $V_{00}$	10V
grid voltage $V_{06}$	-2V~+0.2V
ESD-HBM	TBD

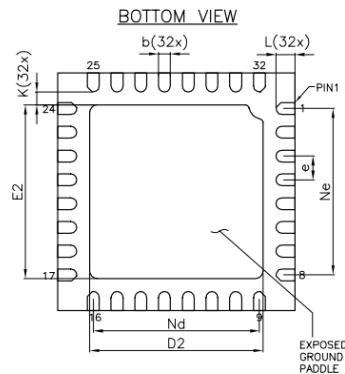
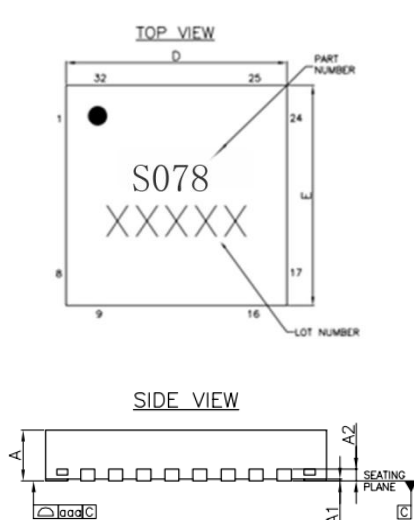
### Package Information

Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWA078SP5	Green resin compounds	NiPdAuAg	MSL 3	S078 XXXXX	RoHS compliant

[1] Maximum reflow temperature 260°C

[2] XXXXX is the lot number

### Dimension



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	4.90	5.00	5.10
D2	3.50	3.65	3.75
e	0.50BSC		
Ne	3.50BSC		
Nd	3.50BSC		
E	4.90	5.00	5.10
E2	3.50	3.65	3.75
K	0.20	---	---
L	0.30	0.40	0.50
aaa	0.08		

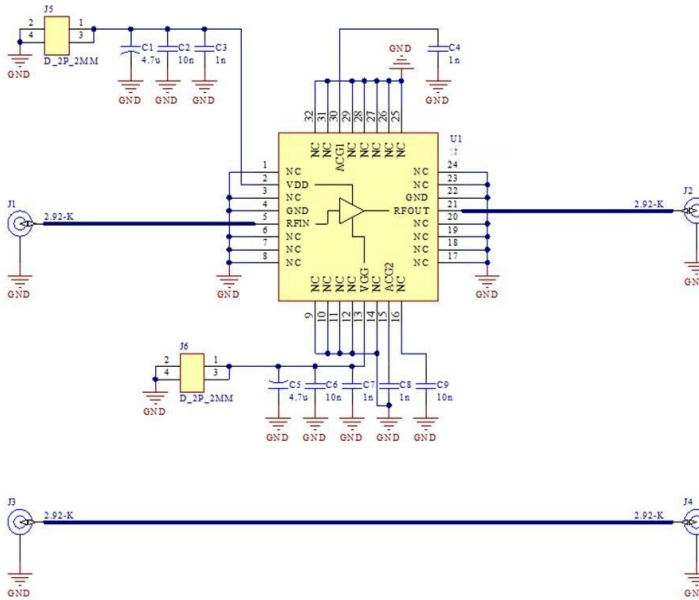
Description:

- Unit: mm
- Lead frame material: copper alloy
- Package surface warpage: not more than 0.05mm
- All ground pins should be connected to PCB RF ground

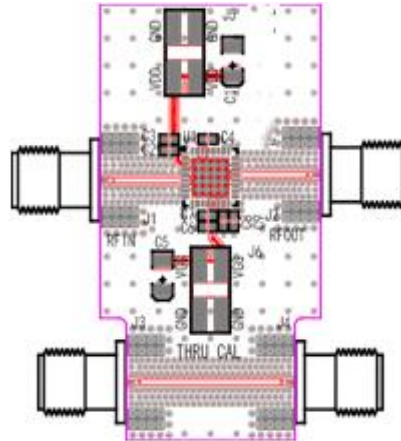
#### Pin Definition

Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	NC	Vacant	17	NC	Vacant
2	VDD	Pressure leakage	18	NC	Vacant
3	NC	Vacant	19	NC	Vacant
4	GND	RF Ground	20	NC	Vacant
5	RFIN	RF input, DC coupling	21	RFOUT	RF output, DC coupling
6	NC	Vacant	22	GND	RF Ground
7	NC	Vacant	23	NC	Vacant
8	NC	Vacant	24	NC	Vacant
9	NC	Vacant	25	NC	Vacant
10	NC	Vacant	26	NC	Vacant
11	NC	Vacant	27	NC	Vacant
12	NC	Vacant	28	NC	Vacant
13	VGG	Grid pressure	29	NC	Vacant
14	NC	Vacant	30	ACG1	Low frequency interfacel
15	ACG2	Low Frequency Interface 2	31	NC	Vacant
16	NC	Vacant	32	NC	Vacant

### Evaluation Boards



Designator	Description
C1, C5	4.7uF Tantalum Capacitor 1206
C2, C6, C9	10nF Multilayer Ceramic Capacitor 0402
C3, C4, C7, C8	1nF Multilayer Ceramic Capacitor 0402
J1, J2, J3, J4	SMA-K connector Nanjing Aowen D360B12E01-023
J5, J6	D_2P_2MM DC pins
U1	CWA078SP5



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 50 ohm impedance, and the ground pin of the package shell should be grounded nearby (similar to the figure), and there should be enough ground holes to connect the top and bottom ground.