

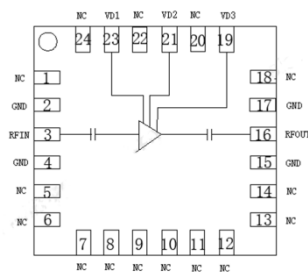
Performance Features

- Broadband width: 6GHz~26.5GHz
- Low noise: 2.5dB typical
- Small signal gain: 21dB
- Output P1dB: 9dBm
- Output IP3: 19dBm
- Package size: 4*4mm 24-pin QFN

Typical Applications

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

Functional Block Diagram



Overview

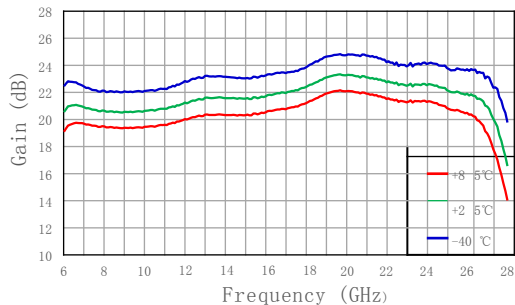
The CWA198SP4 is a 6GHz~26.5GHz low-noise broadband amplifier in a 4*4mm 24-pin QFN package. It requires only 60mA current supply with +3.5V supply and provides 21dB small signal gain, 2.5dB noise figure and 19dBm output IP3.

Electrical performance table (TA=+25°C, VD=3.5V, IDD=60mA)

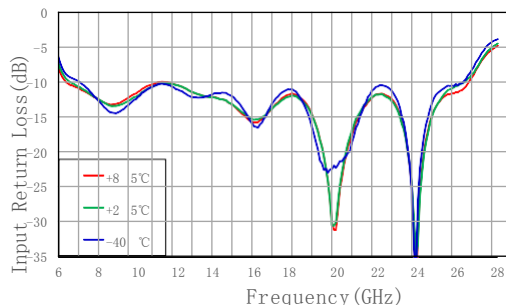
| Parameter Name | Description | Minimum value | Typical values | Maximum value | Unit |
|------------------------------------|--------------------------|---------------|----------------|---------------|------|
| Operating frequency | Ferq | 6~26.5 | | | GHz |
| Gain | S21 | | 21 | | dB |
| Input Return Loss | S11 | | -12 | | dB |
| Output Return Loss | S22 | | -15 | | dB |
| Reverse isolation degree | S12 | | -46 | | dB |
| Output power 1dB compression point | P1dB | | 9 | | dBm |
| Output IP3 | Pout=3dBm/tone, Δf=1 MHz | | 19 | | dBm |
| Saturation power | P3dB | | 11 | | dBm |
| Noise factor | NF | | 2.5 | | dB |
| Operating current | ID | 60 | | | mA |
| Operating Voltage | VD | 3.5 | | | V |

Test Curve

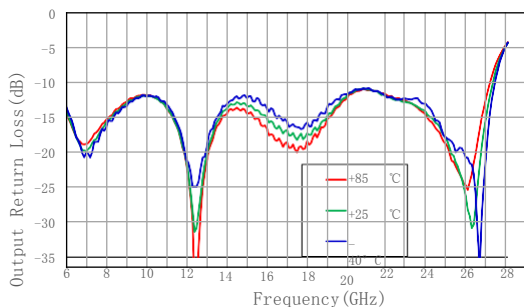
Gain VS Frequency



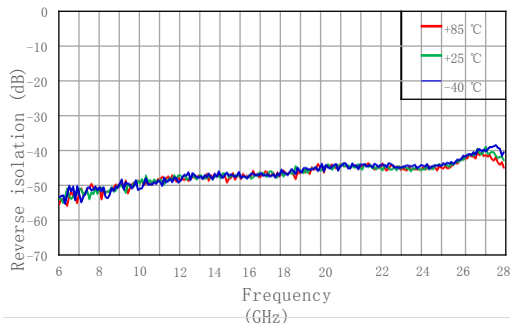
Input Return Loss VS Frequency



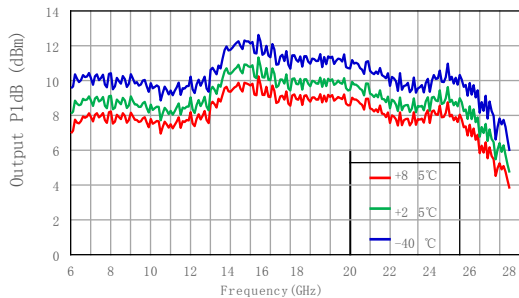
Output Return Loss VS Frequency



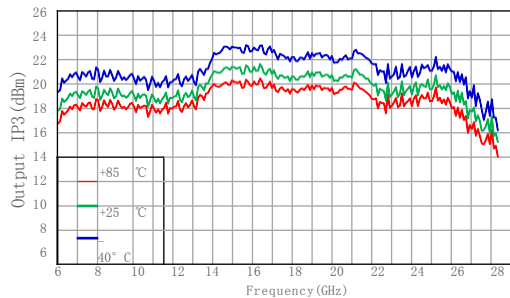
Reverse Isolation VS Frequency



P1dB VS Frequency

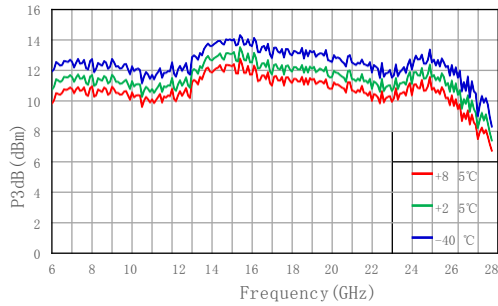


Output IP3 VS Frequency

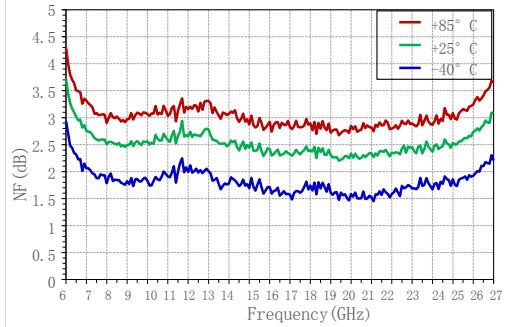


Test Curve

P3dB VS Frequency



Noise factor VS frequency



Working parameters

| | |
|-----------------------|-------------|
| Operating temperature | -40°C~+85°C |
| Bias voltage VD | 3.5V |

Absolute maximum rating

| | |
|---------------------|--------------|
| RF input power | TBD |
| Storage temperature | -65°C~+150°C |
| Bias voltage VD | 4.5V |
| ESD-HBM | 250V |

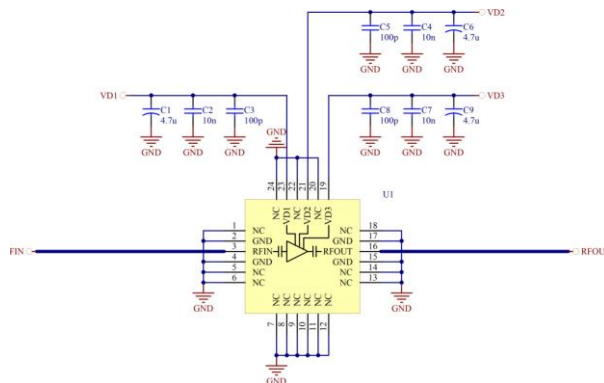
Package Information

| Model | Packaging Materials | Solder plate plating | MSL level [1] | Package identification [2] | Environmental requirements |
|-----------|-----------------------|----------------------|---------------|----------------------------|----------------------------|
| CWA198SP4 | Green resin compounds | NiPdAuAg | MSL 3 | S198 XXXXX | RoHS compliant |

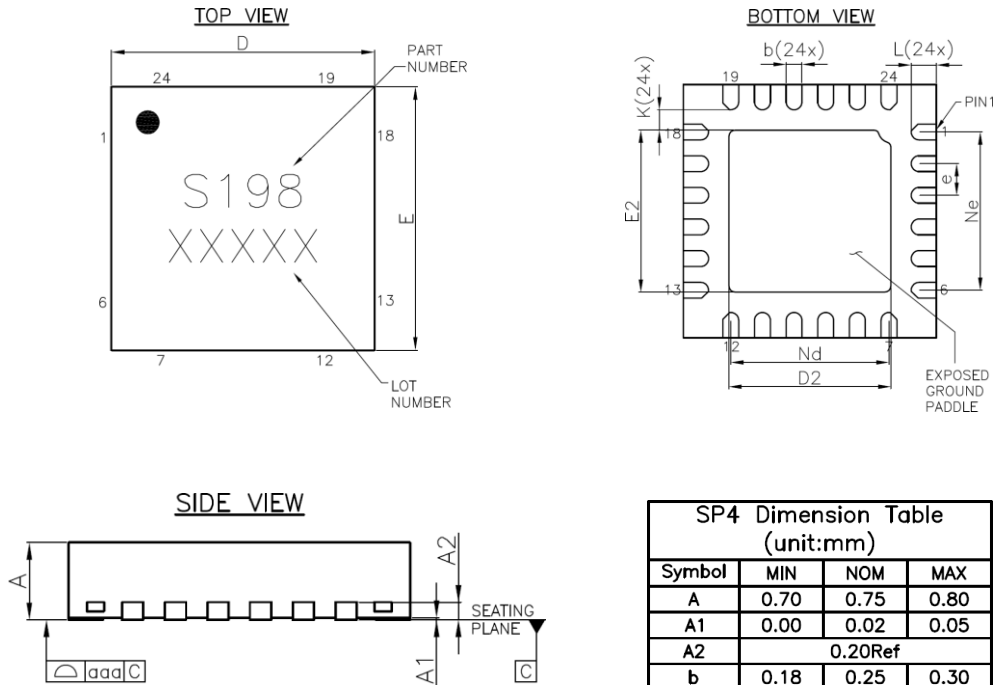
[1] Maximum reflow temperature 260° C

[2] XXXXX is the lot number

Typical Application Diagram



Dimension

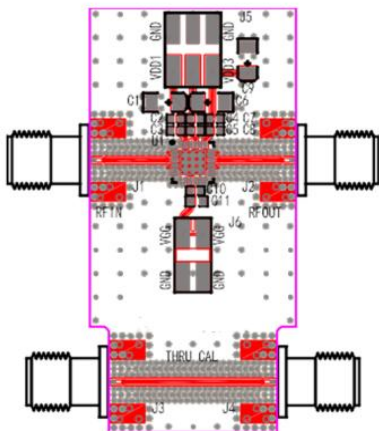
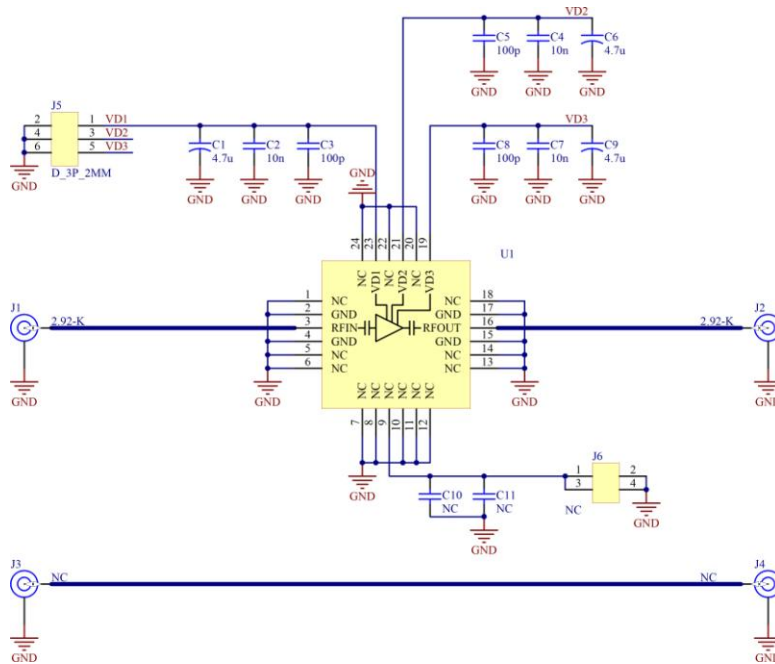


| Symbol | MIN | NOM | MAX |
|--------|---------|------|------|
| A | 0.70 | 0.75 | 0.80 |
| A1 | 0.00 | 0.02 | 0.05 |
| A2 | 0.20Ref | | |
| b | 0.18 | 0.25 | 0.30 |
| D | 3.90 | 4.00 | 4.10 |
| D2 | 2.41 | 2.56 | 2.66 |
| e | 0.50BSC | | |
| Ne | 2.50BSC | | |
| Nd | 2.50BSC | | |
| E | 3.90 | 4.00 | 4.10 |
| E2 | 2.41 | 2.56 | 2.66 |
| K | 0.20 | --- | --- |
| L | 0.30 | 0.40 | 0.50 |
| aaa | 0.08 | | |

Pin Definition

| Pin Number | Function Symbols | Function Description |
|---------------------|------------------|-------------------------------------------------------------------------------|
| 1;5-14; 18-22;24 | NC | No internal connection |
| 2;4;15;17 | GND | RF ground, the bottom of the package exposed paddle is also RF & DC RF ground |
| 19;21;23 | VD3;VD2;VD1 | Power port supply +3.5V |
| 3 | RFIN | RF input port with internal isolation capacitor |
| 16 | RFOUT | RF input port with internal isolation capacitor |

Evaluation Board Circuit Diagram



| DeCwgnator | Description |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| C1, C6, C9 | Tantalum capacitor 1206 4.7uF |
| C2, C4, C7 | Multilayer Ceramic Capacitor 0402 10nF |
| C3, C5, C8 | Multilayer Ceramic Capacitor 0402 100pF |
| J1, J2 | 2.92-K PCB Connectors |
| J5 | 2.0mm DC pins |
| U1 | CWA198SP4 |
| J1, J2 We recommend the NJ Aowen D360B12E01-023 2.92-K connector. | |
| NC indicates that the port is unused or the device is not soldered. The chip NC port can be connected externally to GND. | |