

GaAs monolithic integrated low noise amplifier

0.9 ~ 1.5GHz

**key indicator**

- Frequency range: 0.9~1.5GHz
- Gain: 17dB
- Noise: 0.7dB
- Single power supply operation: +5V@40mA
- Adjustable working frequency\*
- Output P<sub>-1</sub> Adjustable dB and working current\*\*
- Chip size: 1.0mm×1.25mm×0.1mm

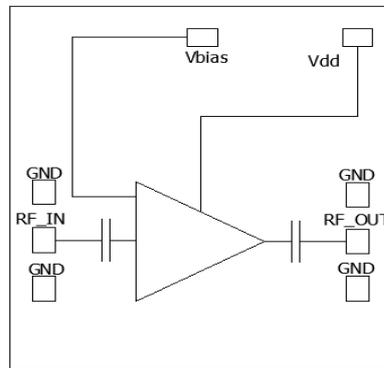
**typical application**

- Radar and electronic countermeasures
- RF/Microwave Circuit
- Military and aerospace
- Test measurement
- Instrumentation

**Product Introduction**

The AY1691 amplifier chip works at 0.9~1.5GHz and is made of GaAs technology. Under 40mA working current, it can provide 17dB gain, 12dBm output P<sub>-1</sub>, and the noise in the normal temperature band is lower than 0.7dB. The chip uses an on-chip metallization process to ensure good grounding, and the back of the chip is metallized, which is suitable for eutectic sintering or conductive adhesive bonding processes.

**Functional block diagram**



**Electrical performance (T<sub>A</sub>=25°C, V<sub>D</sub>=+5V, I<sub>D</sub>=40mA, Z<sub>0</sub>=50Ω)**

| index                      | Minimum   | Typical value | Max | unit |
|----------------------------|-----------|---------------|-----|------|
| frequency                  | 0.9 ~ 1.5 |               |     | GHz  |
| Gain                       | -         | 17            | -   | dB   |
| Gain flatness              | -         | 2.2           | -   | dB   |
| Reverse isolation          | -         | -28           | -   | dB   |
| Input/output standing wave | -         | 1.5           | -   | :one |
| Noise Figure               | -         | 0.7           | -   | dB   |
| Output P <sub>-1</sub> dB  | -         | 12            | -   | dBm  |
| Output IP <sub>3</sub>     | -         | 22.5          | -   | dBm  |
| Working current            | -         | 38            | -   | mA   |

\*The operating frequency is adjusted by the inductor L1  
 \*\* output P<sub>-1</sub> dB and working current can be adjusted by resistor R1

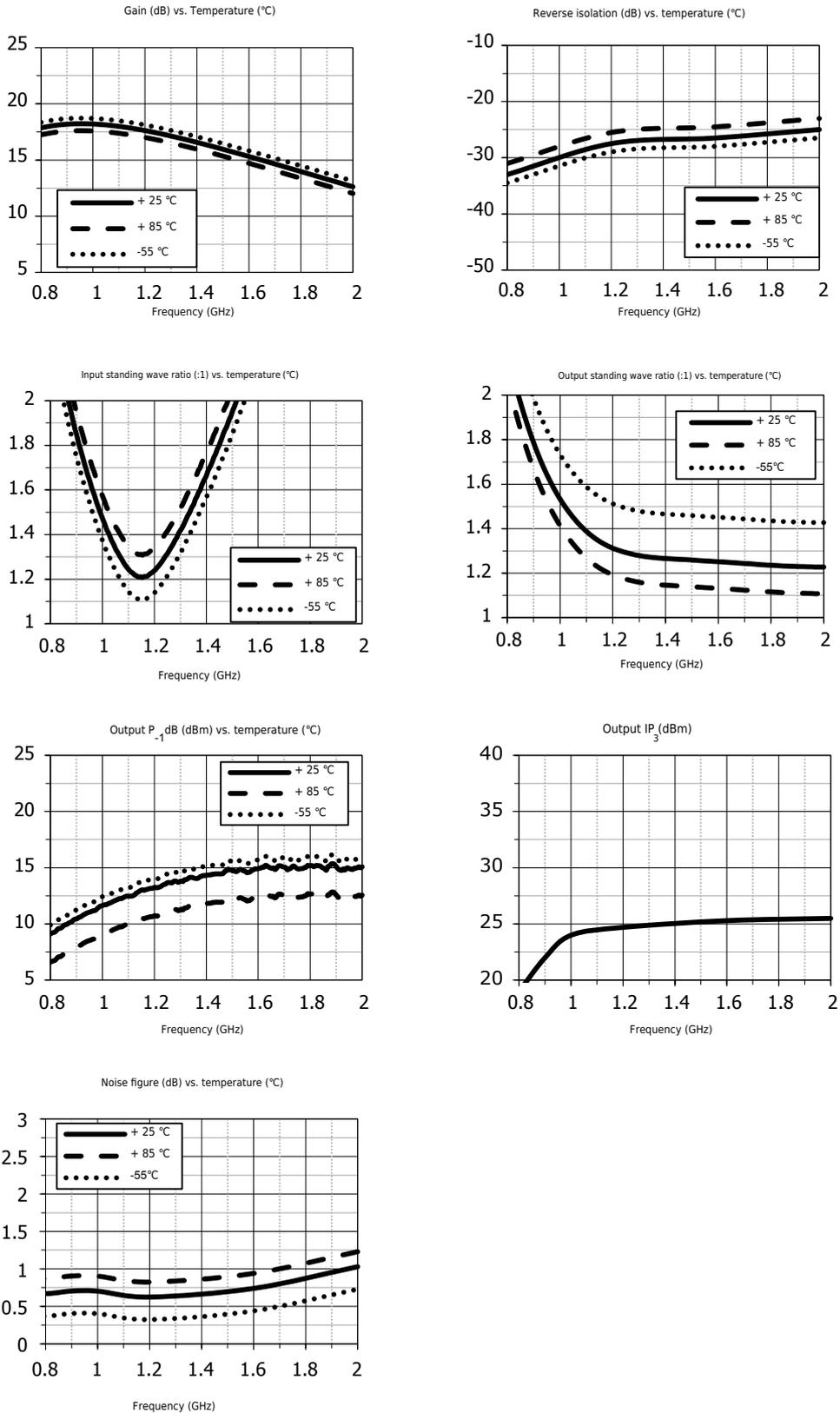
**Absolute maximum rating**

|                     |        |                       |                   |
|---------------------|--------|-----------------------|-------------------|
| Maximum input power | +18dBm | Operating temperature | -55 °C ~ + 85 °C  |
| Channel temperature | 150 °C | Storage temperature   | -65 °C ~ + 150 °C |

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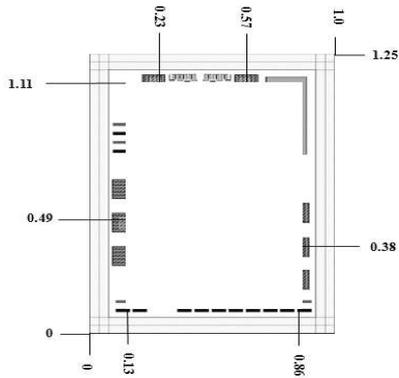
Typical test curve



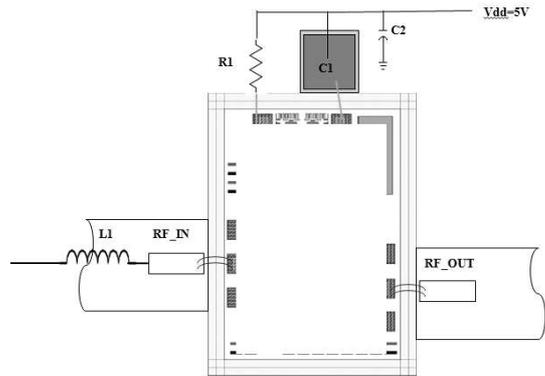
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Shape and port size (mm)



Recommended assembly drawing



Component list

| serial number | Numerical value | model              | manufacturer | Encapsulation |
|---------------|-----------------|--------------------|--------------|---------------|
| C1            | 100pF           | CHIP CAPACITOR     | Redtron      | -             |
| C2            | 10nF            | GRM155R71H103KA88D | Murata       | 0603          |
| R1            | 0Ω              | —                  | -            | 0603          |
| L1            | 8.2nH           | 0402CS-8N2XGE      | Thread art   | 0603          |

Precautions

1. The chip is stored in a dry, nitrogen environment and used in an ultra-clean environment;
2. GaAs material is relatively brittle and cannot touch the surface of the chip, so you must be careful when using it;
3. Chips are sintered with conductive glue or alloy (the alloy temperature cannot exceed 300°C, and the time cannot exceed 30 seconds) to make it fully grounded;
4. The gap between the microwave port of the chip and the substrate should not exceed 0.05mm. Use Φ25μm double gold wire for bonding. The recommended length of gold wire is 250~400μm;
5. The chip is sensitive to static electricity, so pay attention to anti-static during storage and use.