2.4GHz / 5.8GHz Dual-Band 30dB Low Noise Amplifier

P/N: **ZL2458**

Datasheet Version 1.0

January 2026

1. Product Overview

ZL2458 is a dual-band low noise amplifier covering 2.4–2.5 GHz and 5–6 GHz. It features excellent frequency selectivity, high gain, low noise figure, and good gain flatness. It is suitable for various RF receiving front-ends and can be applied in scientific research, industrial communications, university research, and other fields. Due to its ultra-wide bandwidth, it is also well suited for radio management applications such as full-band spectrum reconnaissance and EMC (electromagnetic compatibility) receiving-end testing.

The amplifier housing is precision CNC-milled from aviation-grade aluminum alloy, offering high accuracy and light weight. The surface undergoes natural conductive oxidation treatment, providing excellent conductivity and electromagnetic shielding performance. This effectively shields the amplifier's own radiation and isolates external environmental radiation. The power supply port uses RF feedthrough capacitors that effectively filter out power-supply spikes and other noise.

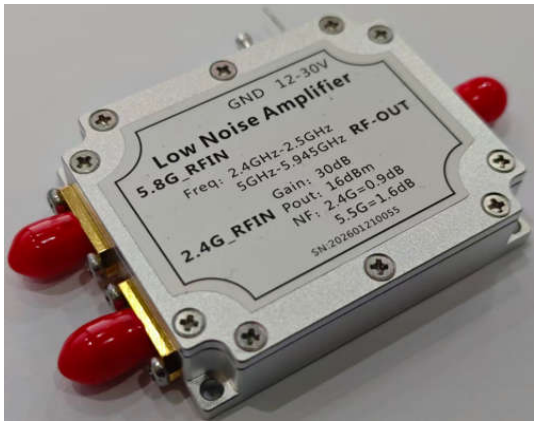


Figure 1. ZL2458 Dual-Band LNA Module

2. Key Features

- **Frequency Range:** 2.4 GHz & 5.8 GHz bands
- **Gain:** 30 dB typical
- **P1dB:** 20 dBm (typ.)
- **Noise Figure:** 1.5 dB typical
- **Power Supply Voltage:** 5–30 V
- **Operating Current:** 160 mA @ 12 V / ~160 mA @ 28 V
- **RF Connectors:** SMA-Female

- **Power Feed:** 3000 pF RF feedthrough capacitor
- **Housing:** CNC-machined aviation aluminum with conductive oxidation
- **Weight:** 63 g

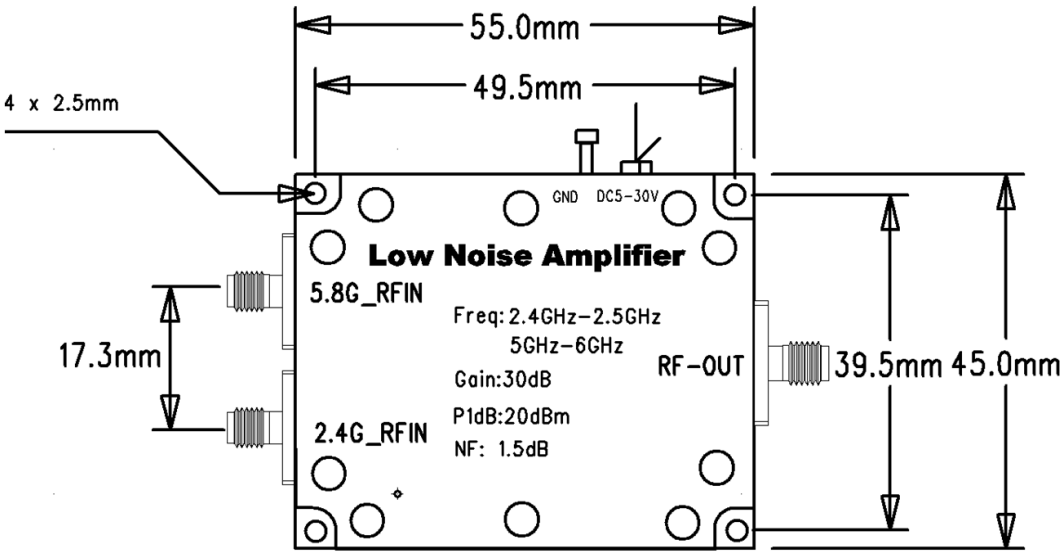
3. Electrical Specifications

Parameter	Min	Typ	Max	Unit
Frequency Range (Band 1)	2400	—	2500	MHz
Frequency Range (Band 2)	5000	—	5945	MHz
Gain	29	30	31	dB
Gain Flatness (2.4 GHz)	—	±0.5	—	dB
Gain Flatness (5.5 GHz)	—	±1	—	dB
Noise Figure (2.4 GHz)	0.6	0.8	1.0	dB
Noise Figure (5.5 GHz)	1.2	1.5	1.7	dB
Output Power (2.4 GHz)	—	15	—	dBm
Output Power (5.8 GHz)	—	17	—	dBm
Input VSWR	—	< 2.0	—	—
Output VSWR	—	< 2.0	—	—
Characteristic Impedance	—	50	—	Ω
Input Power (CW)	—	-15	—	dBm
Supply Voltage	12	—	30	V
Supply Current (at 28 V)	0.30	0.35	0.40	A
Operating Temperature	-40	+25	+55	°C
Storage Temperature	-40	+25	+85	°C
Weight	—	63	—	g

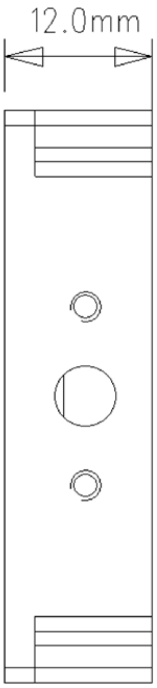
Note: Typical values measured at TA = +25 °C unless otherwise specified.

4. Outline Drawing

Unit: mm



Top View



Side View

5. Test Report

5.1 Test Conditions

Ambient Temperature TA = +25 °C; DC Supply = 5 V – 28 V; Operating Current ≈ 160 mA @ 28 V.
Test Instruments: Keysight E5071C, Agilent 346A, N5182A, N9020A.

Summary Results: 2.4 GHz band — Gain ≈ 30 dB, Noise Figure ≈ 0.8 dB (typ.); 5.8 GHz band — Gain ≈ 30–32 dB, Noise Figure ≈ 1.2 dB (typ.).

5.2 2.4 GHz – 2.5 GHz Performance Data

Freq (MHz)	P1dB (dBm)	Gain (dB)	NF (dB)
2400	15.5	30.5	0.82
2410	15.2	30.5	0.77
2420	15.3	30.5	0.81
2430	15.3	30.5	0.81
2440	15.3	30.5	0.77
2450	15.3	30.5	0.86
2460	15.3	30.5	0.80
2470	15.5	30.5	0.80
2480	15.6	30.5	0.81
2490	15.7	30.5	0.82
2500	15.6	30.5	0.85

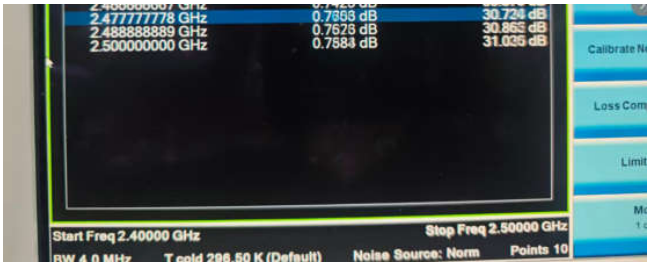
5.3 5.0 GHz – 5.945 GHz Performance Data

Freq (MHz)	P1dB (dBm)	Gain (dB)	NF (dB)
5000	17.2	32.5	1.0
5100	17.1	32.6	1.1
5200	17.0	32.7	1.2
5300	17.2	32.57	1.2
5400	17.2	32.2	1.1
5500	17.2	32.3	1.2
5600	17.5	32.7	1.3
5700	16.9	32.6	1.2
5800	16.8	32.7	1.2
5900	17.2	30.7	1.2
5945	17.2	30.3	1.3

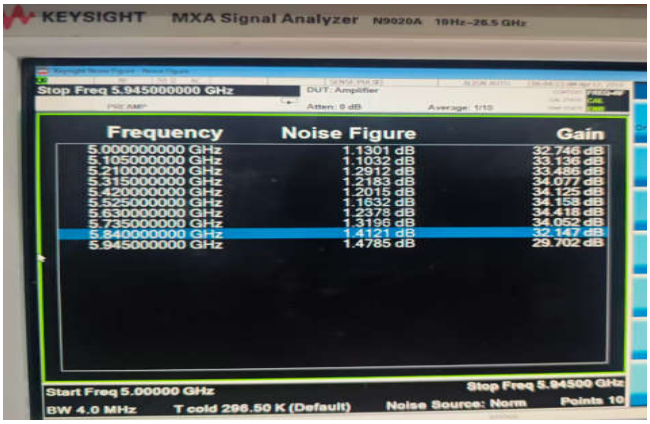
6. Test Pictures



2.4 GHz Noise Figure Measurement



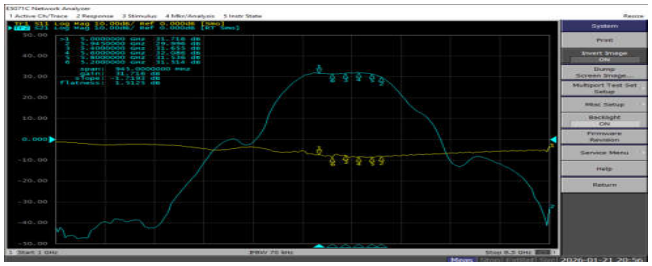
5.8 GHz Noise Figure Measurement



2.4 GHz Gain Curve



5.8 GHz Gain Curve



Additional Measurement Screen

7. RoHS Compliance

The products manufactured by this company do not contain Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium, Polybrominated Biphenyls (PBB), or Polybrominated Diphenyl Ethers (PBDE). Therefore, they are considered compliant with the RoHS standard.

8. Electrostatic Discharge (ESD) Protection

Although this product is designed to be as robust as possible, electrostatic discharge may damage the device. Appropriate ESD precautions must be observed during handling and operation.

9. Disclaimer

The information provided herein is believed to be reliable at the time of publication. The company reserves the right to change its products, specifications, and product descriptions at any time without notice. The company assumes no responsibility for the use of this information; all risk associated with the use of this information is entirely borne by the user. The company does not warrant that its products are suitable for any particular purpose and assumes no liability, including but not limited to indirect and incidental damages. The company does not authorize

or warrant the use of any of its products in life-support equipment or systems.