

1–10 GHz 40 dB Broadband Low Noise Amplifier

P/N: ZL110G

Version 1.0 | December 2025

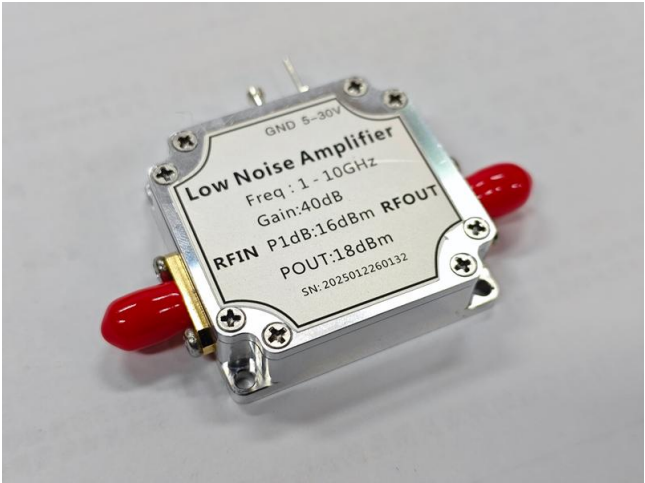


Figure 1. ZL110G Module

1. Product Overview

The ZL110G is an ultra-wideband low-noise amplifier covering 1 GHz to 10 GHz. It offers a wide frequency range, high gain, and low noise figure, making it suitable for various RF receiver front-ends. Typical applications include scientific research, industrial communications, university laboratories, and related fields. Owing to its ultra-wide bandwidth, the amplifier is also well suited for radio spectrum management, full-band spectrum reconnaissance, and EMC (electromagnetic compatibility) receiver-end testing.

The housing is precision CNC-milled from aerospace-grade aluminum alloy, providing high dimensional accuracy and light weight. The exterior is finished with natural conductive anodizing, delivering excellent electrical conductivity and electromagnetic shielding performance. This design effectively suppresses the amplifier’s own radiation and isolates it from external electromagnetic interference. The DC power port employs an RF feed-through capacitor that effectively filters spike pulses and other high-frequency noise present on the supply line.

2. Features

- Frequency Range: 1–10 GHz
- Gain: 40 dB typical
- P1dB: 17 dBm typical
- Noise Figure: 1.0 dB typical (see detailed table)
- Supply Voltage: 5–30 V
- Operating Current: 130 mA @ 12 V
- RF Connectors: SMA Female
- DC Feed: 3000 pF RF feed-through capacitor

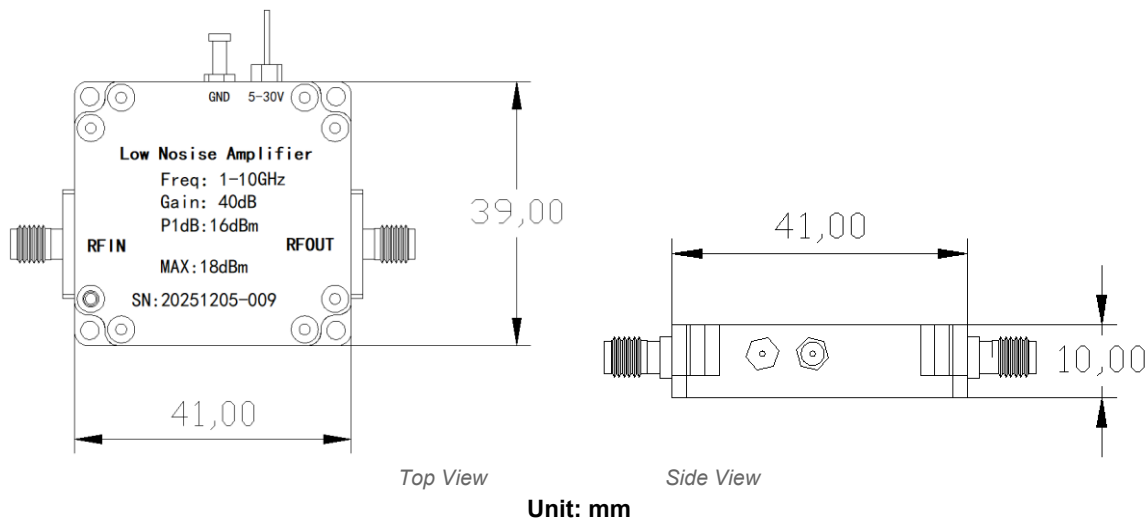
3. Electrical Specifications

Unless otherwise specified, values are measured at TA = +25 °C.

Parameter	Min	Typ	Max	Units
Frequency Range	1	—	10	GHz
Gain	39	40	41	dB
Gain Flatness	—	±2	—	dB
Noise Figure	0.8	1.3	2.1 (at 10 GHz)	dB
P1dB	16	17	18	dBm
Input VSWR	—	< 2.0	—	—

Output VSWR	—	< 2.0	—	—
Characteristic Impedance	—	50	—	Ω
Input Power (CW, max recommended)	—	-15	—	dBm
Supply Voltage	5	12	30	V
Supply Current	0.125	0.13	0.15	A
Operating Temperature	-40	+25	+55	°C
Storage Temperature	-40	+25	+85	°C
Weight	—	—	—	g

4. Outline Drawing



5. Test Report

5.1 Test Conditions

Ambient temperature TA = +25 °C; DC supply 5–28 V (140 mA at 28 V).
Test instruments: Keysight E5071C, Agilent 346A, N5182A, N9020A.
Summary result (1–8.5 GHz): Gain ≈ 41 dB, Noise Figure ≈ 1.2 dB.

5.2 Gain Performance

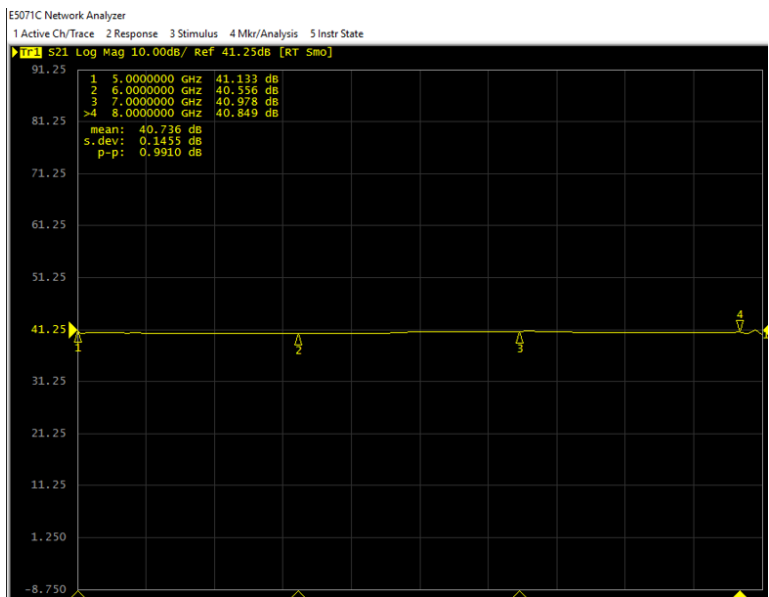


Figure 2. Gain response, 5 GHz – 8 GHz

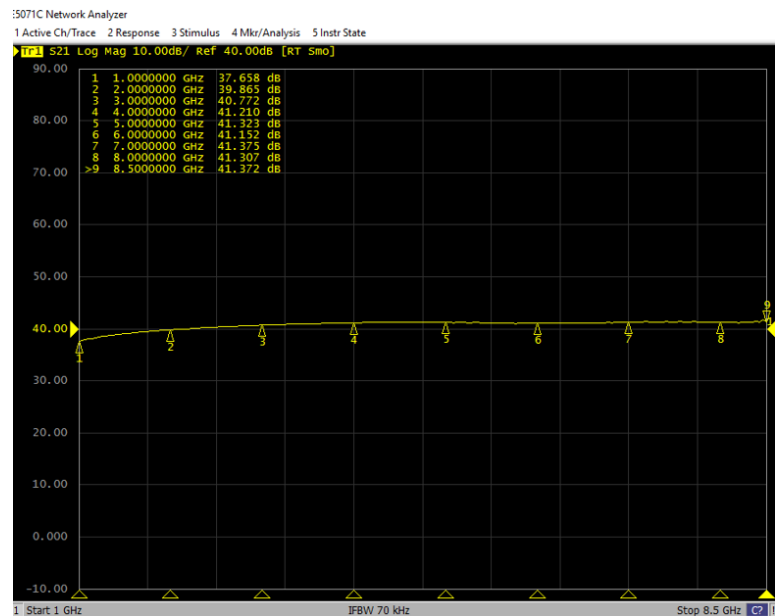


Figure 3. Gain response, 1 GHz – 8.5 GHz

5.3 Noise Figure Performance

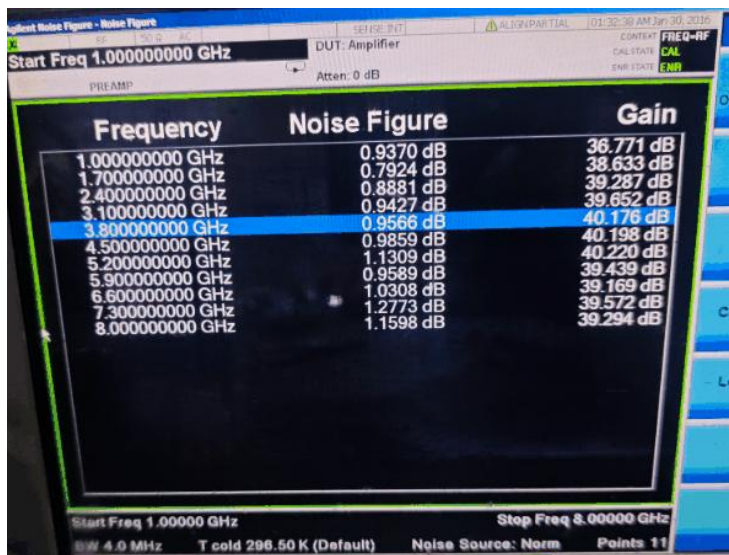


Figure 4. Noise figure, 1 GHz – 8 GHz

5.4 Measured Data Summary

Freq (MHz)	P1dB (dBm)	Gain (dB)	NF (dB)
1000	18.5	37.5	0.93
2000	18.4	39.8	0.88
3000	18.3	40.7	0.94
4000	18.4	41.2	0.95
5000	17.5	41.3	1.13
6000	17.5	41.1	0.98
7000	17.3	41.3	1.22
8000	17.3	41.3	1.27
9000	16.8	41.3	1.52
10000	16.2	39.6	2.14

6. RoHS Compliance

Products manufactured by our company do not contain Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr⁶⁺), Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ethers (PBDE). The products are therefore considered to comply with the RoHS Directive.

7. Electrostatic Discharge (ESD) Protection

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

8. Disclaimer

The information provided herein is believed to be reliable at the time of publication. Our company reserves the right to change its products, specifications and product descriptions at any time without notice.

Our company assumes no responsibility for the use of this information; all risks associated with such use are borne entirely by the user. Our company does not warrant that its products are suitable for any particular purpose, nor does it assume any liability, including but not limited to indirect or incidental damages.

Our company does not authorize or warrant any of its products for use in life-support equipment or systems.