

Teyleten Robot Small47

Teyleten Robot 0.1-2000MHz RF Wideband LNA Amplifier

Model: Small47

Brand: Teyleten Robot

1. INTRODUCTION

This manual provides essential information for the safe and effective use of your Teyleten Robot 0.1-2000MHz RF Wideband LNA Amplifier, Model Small47. Please read it thoroughly before installation and operation to ensure optimal performance and longevity of the device. This amplifier is designed to enhance weak RF signals across a broad frequency spectrum.

2. PRODUCT FEATURES

- **Wide Frequency Range:** Operates from 0.1 MHz to 2000 MHz.
- **High Gain:** Provides significant signal amplification, up to 32 dB.
- **Low Noise Figure (LNA):** Designed for low noise amplification, crucial for weak signal reception.
- **Enhanced Communication Distance:** Improves the range and clarity of RF communication.
- **Versatile Applications:** Suitable for various RF reception front-ends, including shortwave radio, FM radio, remote control receivers, and cable TV signal amplification.

3. SPECIFICATIONS

Parameter	Value
Operating Frequency	0.1 - 2000 MHz
Amplifier Gain (F=0.1MHz)	32 dB
Amplifier Gain (F=500MHz)	31 dB

Parameter	Value
Amplifier Gain (F=1000MHz)	29 dB
Amplifier Gain (F=1500MHz)	25 dB
Amplifier Gain (F=2000MHz)	20 dB
Maximum Power Output	+10 dBm (10 mW)
Power Supply Voltage	6 - 12 VDC
System Impedance	50 Ohm
Product Dimensions (LxWxH)	33 x 25 x 8 mm

4. SETUP

Follow these steps to set up your RF amplifier:

1. **Power Connection:** Connect a DC power supply within the 6-12 VDC range to the VCC and GND pads on the amplifier board. Ensure correct polarity.
2. **RF Input:** Connect your RF signal source to the 'RFin' connector. This is typically the signal you wish to amplify.
3. **RF Output:** Connect your receiving device or antenna to the 'RFout' connector. This will carry the amplified signal.
4. **Impedance Matching:** Ensure that both your input and output devices have a 50 Ohm impedance for optimal performance.

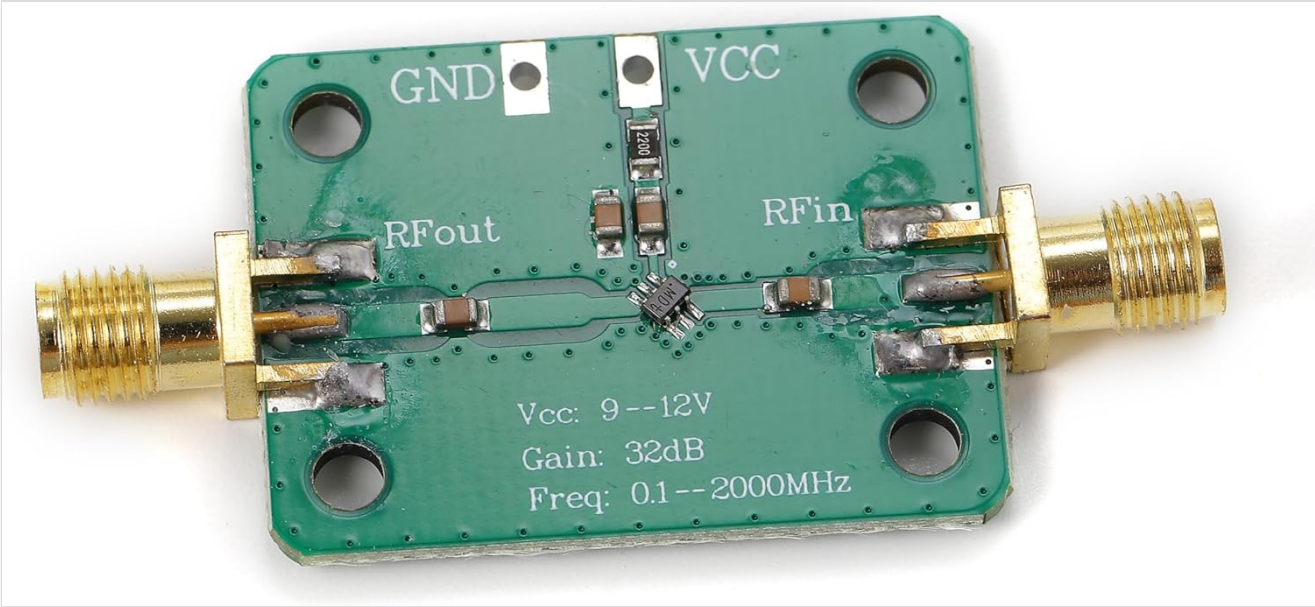


Figure 1: Top-down view of the amplifier board, indicating RFin, RFout, VCC, and GND connections.

Description for Figure 1: This image displays the top surface of the Teyleten Robot RF amplifier module. Clearly visible are the 'RFin' (RF Input) and 'RFout' (RF Output) connectors, along with the 'VCC' (Power Supply) and 'GND' (Ground) pads for power connection. The board also shows the specified voltage range (Vcc: 9-12V), gain (32dB), and frequency range (0.1-2000MHz).

5. OPERATING INSTRUCTIONS

Once the amplifier is correctly set up, apply power. The amplifier will immediately begin to amplify the RF signal present at the RFin port and output it through the RFout port. No further user configuration is typically required for basic operation.

- **Signal Level:** Ensure the input signal level does not exceed the amplifier's maximum input rating to prevent saturation or damage. The maximum output power is +10dBm (10mW).
- **Frequency Response:** The gain varies across the frequency range. Refer to the specifications section for detailed gain values at different frequencies.

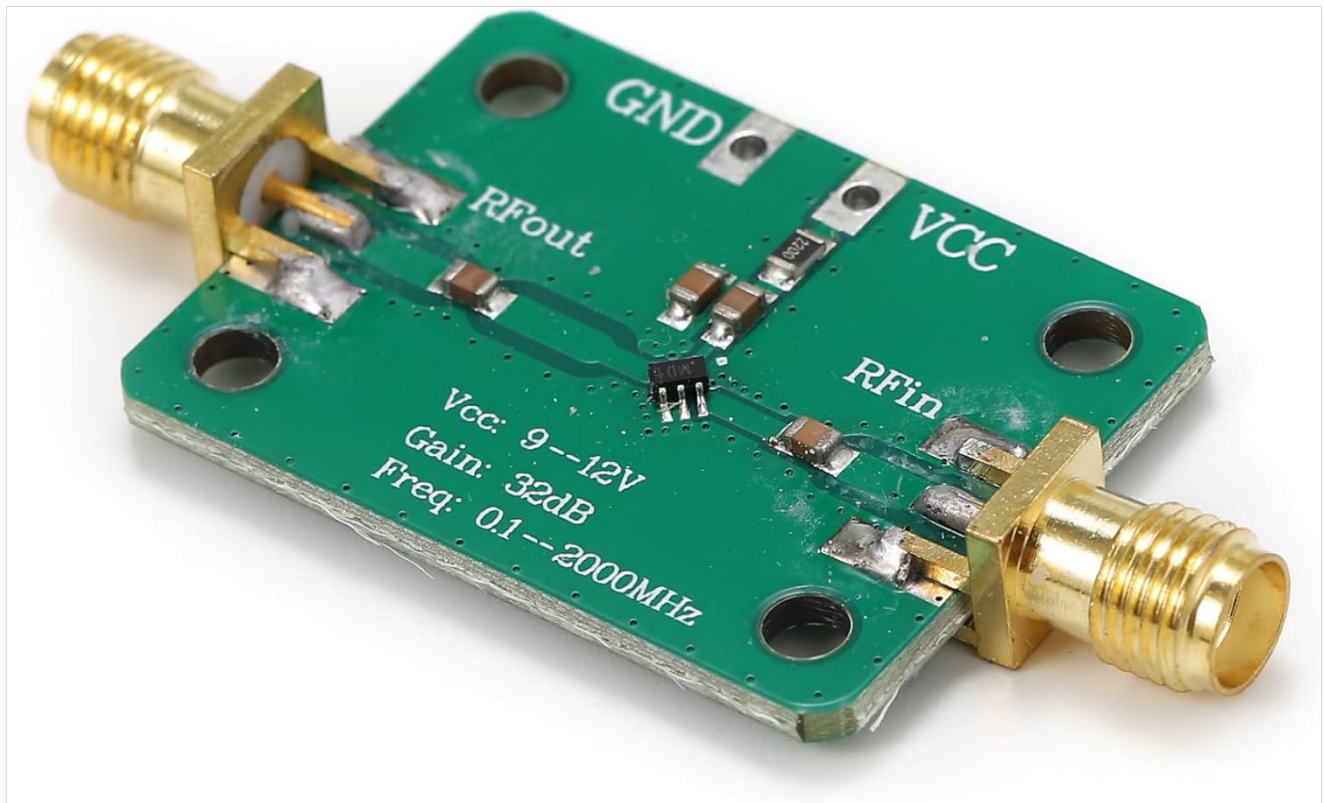


Figure 2: Angled view of the amplifier, showing the RF input and output connectors.

Description for Figure 2: This image provides an angled perspective of the Teyleten Robot RF amplifier module. It clearly shows the gold-plated SMA connectors for RF input and output on either side of the green PCB. The board's markings for VCC, GND, RFin, RFout, gain, and frequency range are also visible, offering a comprehensive view of the device's connections and basic parameters.

6. APPLICATION NOTES

- **Frequency Response Below 500 MHz:** The amplifier exhibits excellent performance below 500 MHz. With careful adjustment, a gain flatness of less than 1 dB can be achieved. Lower frequencies generally offer higher gain consistency.
- **Low-Frequency Cutoff Adjustment:** The lower operating frequency limit is influenced by the input and output coupling capacitors. The default 0.1 μ F capacitors allow operation down to 0.1 MHz. To extend the low-frequency cutoff (e.g., to 5 KHz), you can increase the capacitance of the input and output capacitors to 10 μ F or higher.
- **Variable Gain Operation (5-8 VDC):** When the power supply voltage is varied between 5 V and 8 V, the amplifier can function as a variable gain amplifier. The gain increases proportionally with the supply voltage. This feature is suitable for wireless receiver front-end circuits requiring Automatic Gain Control (AGC) by using

a DA-controlled power supply voltage.

- **Optimal Stability (8-10 VDC):** At a power supply voltage between 8 V and 10 V, the amplifier provides a low-frequency end gain of up to 30 dB, exhibiting a low noise figure and excellent stability.
- **Maximum Gain (12 VDC):** When powered with 12 VDC, the amplifier achieves its maximum gain, with the low-frequency end gain reaching 32.5 dB.

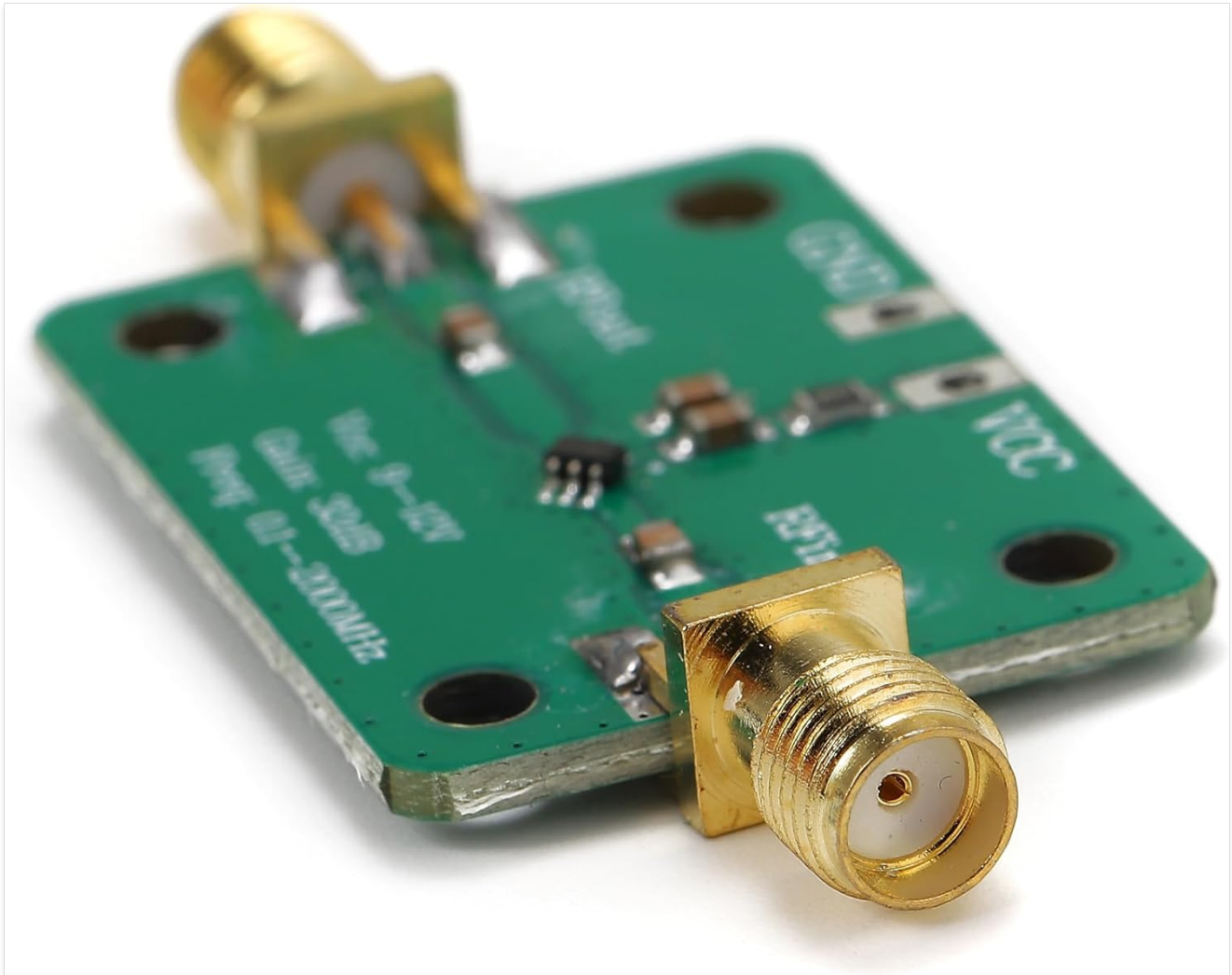


Figure 3: Side view of the amplifier, illustrating its compact design.

Description for Figure 3: This image presents a side view of the Teyleten Robot RF amplifier module. It highlights the compact form factor of the green PCB and the gold-plated SMA connectors extending from its ends. This perspective helps visualize the amplifier's small size, making it suitable for integration into various projects where space is limited.

7. MAINTENANCE

The Teyleten Robot RF Wideband LNA Amplifier is a low-maintenance device. To ensure its longevity and reliable operation:

- **Keep Dry:** Avoid exposure to moisture or liquids.
- **Cleanliness:** Keep the board free from dust and debris. Use a soft, dry cloth for cleaning if necessary.
- **Physical Protection:** Handle the board carefully to prevent physical damage to components or connectors.
- **No User-Serviceable Parts:** Do not attempt to open or repair the device yourself. Doing so may void any applicable warranty and could damage the amplifier.

8. TROUBLESHOOTING

If you encounter issues with your amplifier, consider the following troubleshooting steps:

- **No Output Signal or Low Gain:**

- Verify that the power supply voltage is within the specified range of 6-12 VDC and that polarity is correct.
- Check all RF cable connections to ensure they are secure and properly seated.
- Confirm that the input and output devices have a 50 Ohm impedance. Mismatched impedance can lead to signal loss.
- Ensure the input signal level is not too low or too high, potentially causing the amplifier to operate outside its linear range.

- **Distorted Output Signal:**

- The input signal level might be too high, causing the amplifier to saturate. Reduce the input signal power.
- Check for any external interference that might be affecting the signal.

9. WARRANTY AND SUPPORT

For technical support, warranty inquiries, or any questions regarding the Teyleten Robot 0.1-2000MHz RF Wideband LNA Amplifier, please contact Teyleten Robot customer service through your point of purchase or the official brand website. Please have your product model number (Small47) and purchase details available when contacting support.