AURSINC Radioberry Preamp Board V2 Instruction Manual

Brand: AURSINC | **Model:** Radioberry Preamp Board

1. Product Overview

The AURSINC Radioberry Preamp Board V2 is an amplification module designed to enhance the capabilities of your Radioberry SDR setup, transforming it into a compact QRP (low-power) radio. This board provides HF power output ranging from 3W to 5W, suitable for driving larger HF amplifiers (10W-100W PA). It is specifically engineered for seamless integration with Raspberry Pi 4 and 4B boards, combining digital signal processing with radio functionality in a small form factor. The V2 version offers improved output power compared to its predecessor.

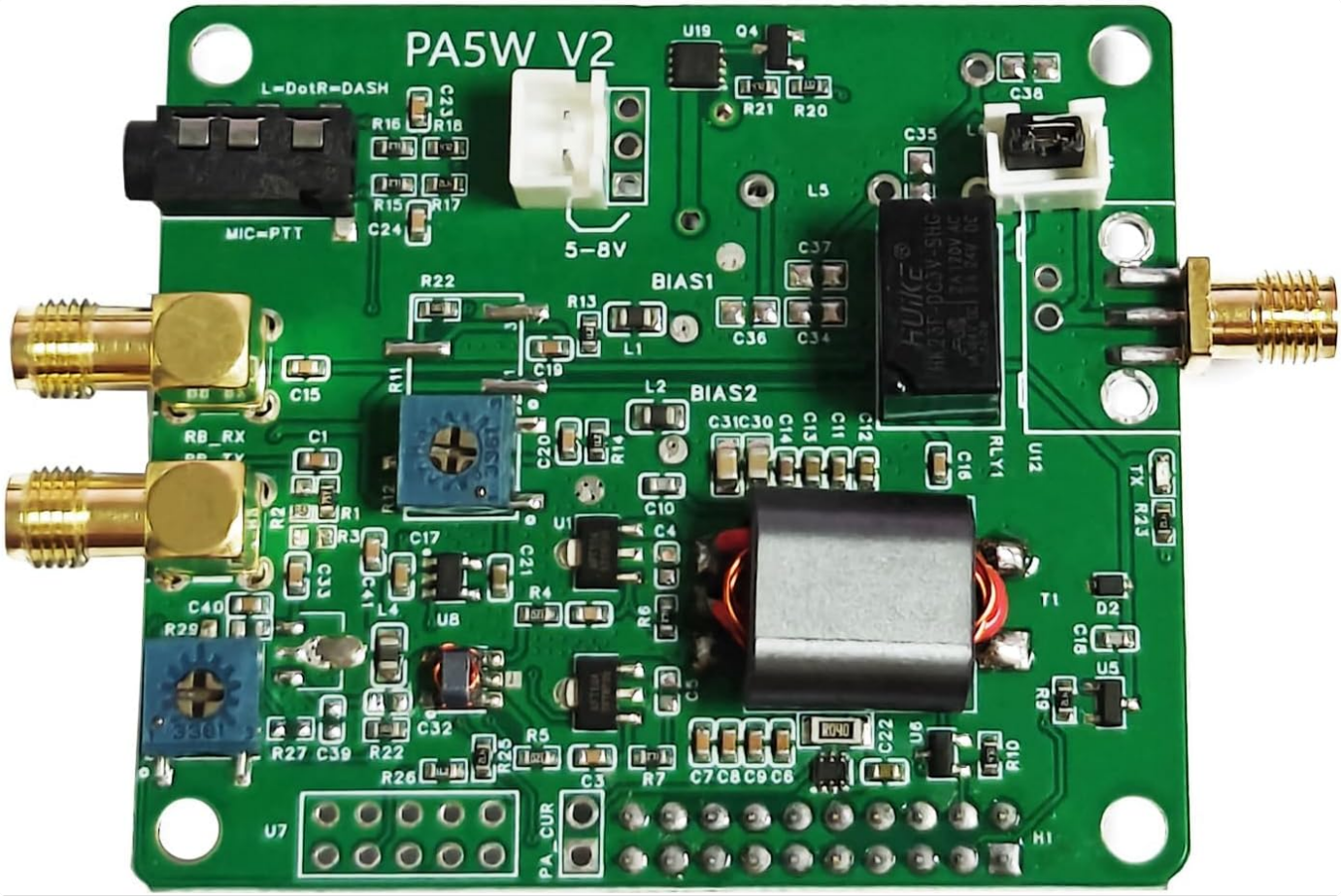

Figure 1.1: Top view of the AURSINC Radioberry Preamp Board V2. This image displays the compact green circuit board with various electronic components, connectors, and adjustment potentiometers.

2. Package Contents

Upon opening the package, verify that all the following components are present:

- 1x Radioberry Preamp Board V2
- 3x SMA cables (1 for Rx, 1 for Tx, 1 for ANT)
- 1x 8V Battery-powered Wire
- 1x Connecting Row Needle
- 4x Screws and Nuts
- 8x Plastic Columns

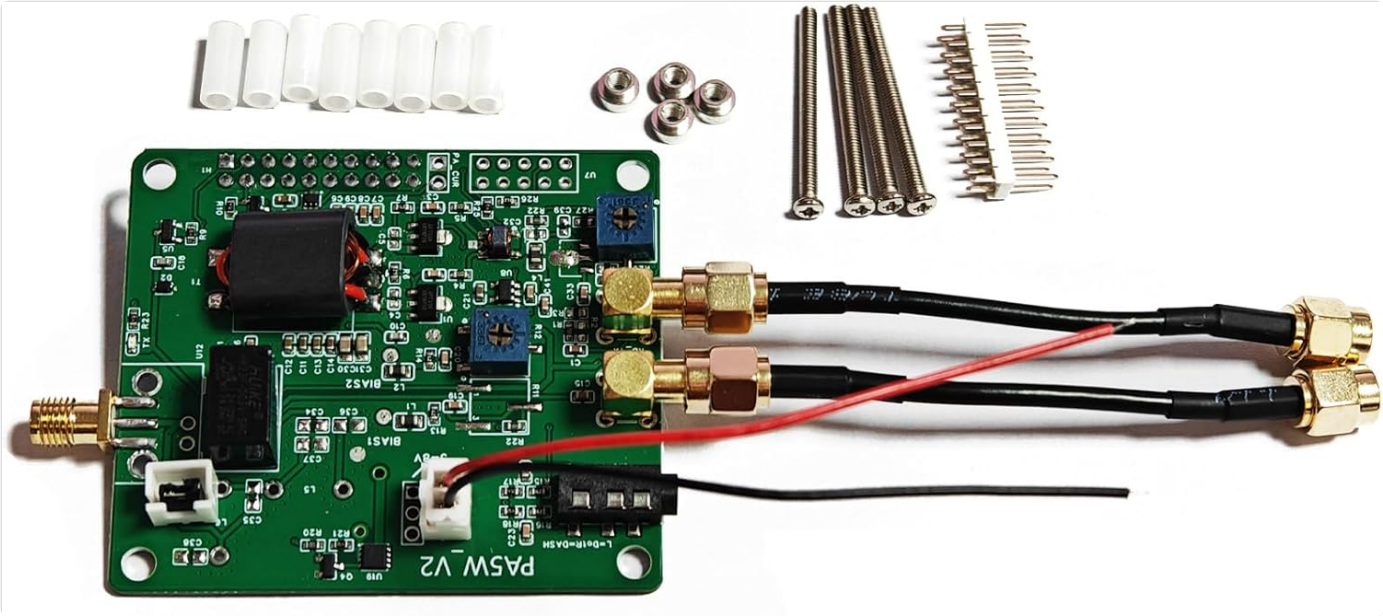

Figure 2.1: All components included with the AURSINC Radioberry Preamp Board V2. The image shows the main board along with SMA cables, power wire, connecting pins, screws, nuts, and plastic standoffs.

3. Setup and Installation

The Radioberry Preamp Board V2 is designed for straightforward integration with your Raspberry Pi 4 or 4B and Radioberry board. Follow these steps for proper setup:

1. **Mounting:** Carefully align the Radioberry Preamp Board V2 with your Radioberry board and Raspberry Pi. Use the provided plastic columns, screws, and nuts to securely stack and fasten the boards together. Ensure all pins are correctly aligned before applying pressure.
2. **Power Connection:** Connect the 8V battery-powered wire to the designated power input on the preamp board. The preferred input voltage is 8.4V, with a range of 6-8V supported.
3. **SMA Cable Connections:**
    - Connect one SMA cable from the Radioberry's transmit (Tx) output to the "HF Power In" port on the preamp board.
    - Connect another SMA cable from the preamp board's "HF Power Out" port to your antenna or subsequent HF amplifier.
    - Connect the third SMA cable for the receive (Rx) path as required by your specific Radioberry setup.
4. **PTT/Mic Connection:** If using a PTT (Push-To-Talk) or microphone, connect it to the appropriate jack on the preamp board.

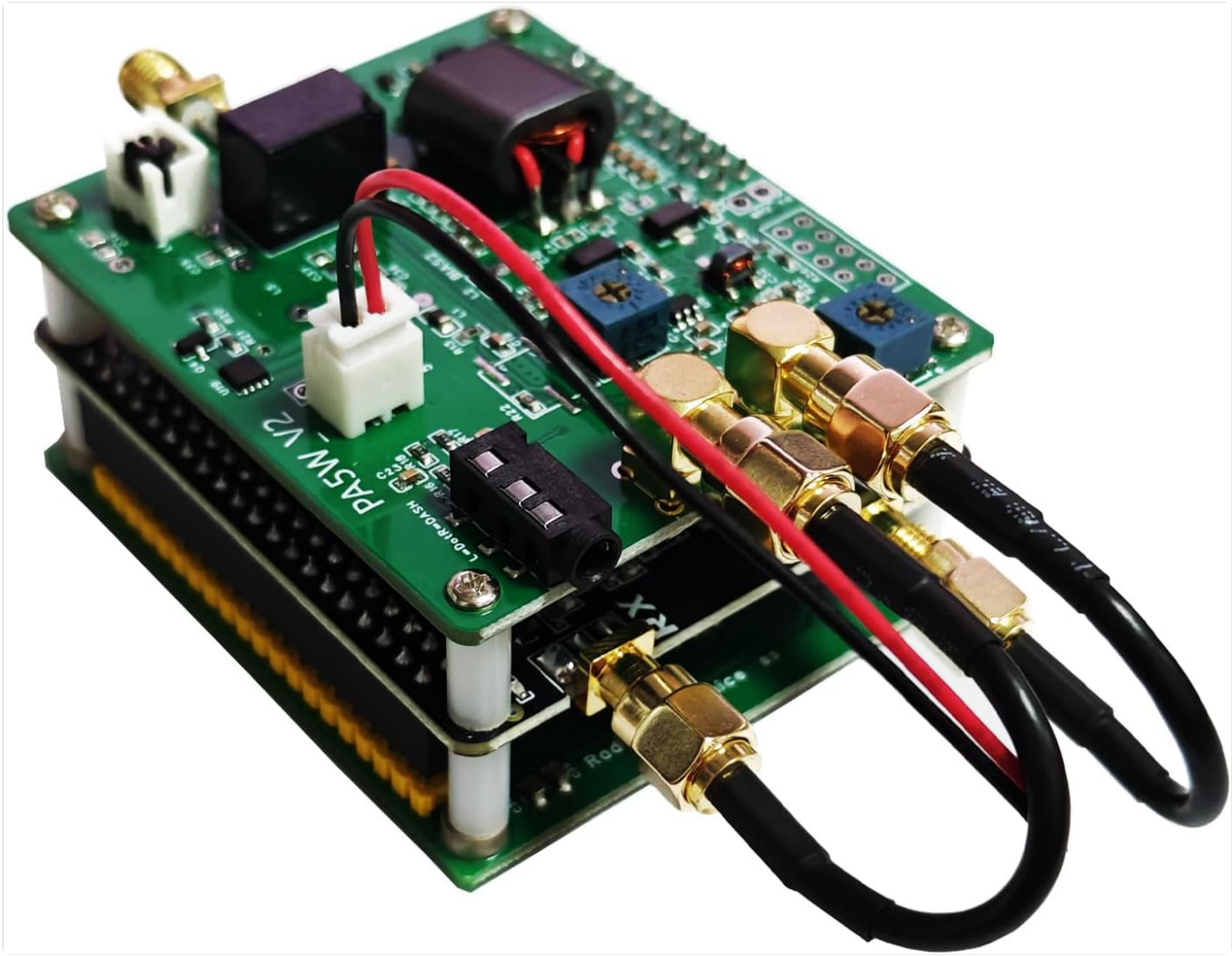

Figure 3.1: The Radioberry Preamp Board V2 mounted atop a Raspberry Pi board. This illustrates the physical stacking and connection of the two main components.

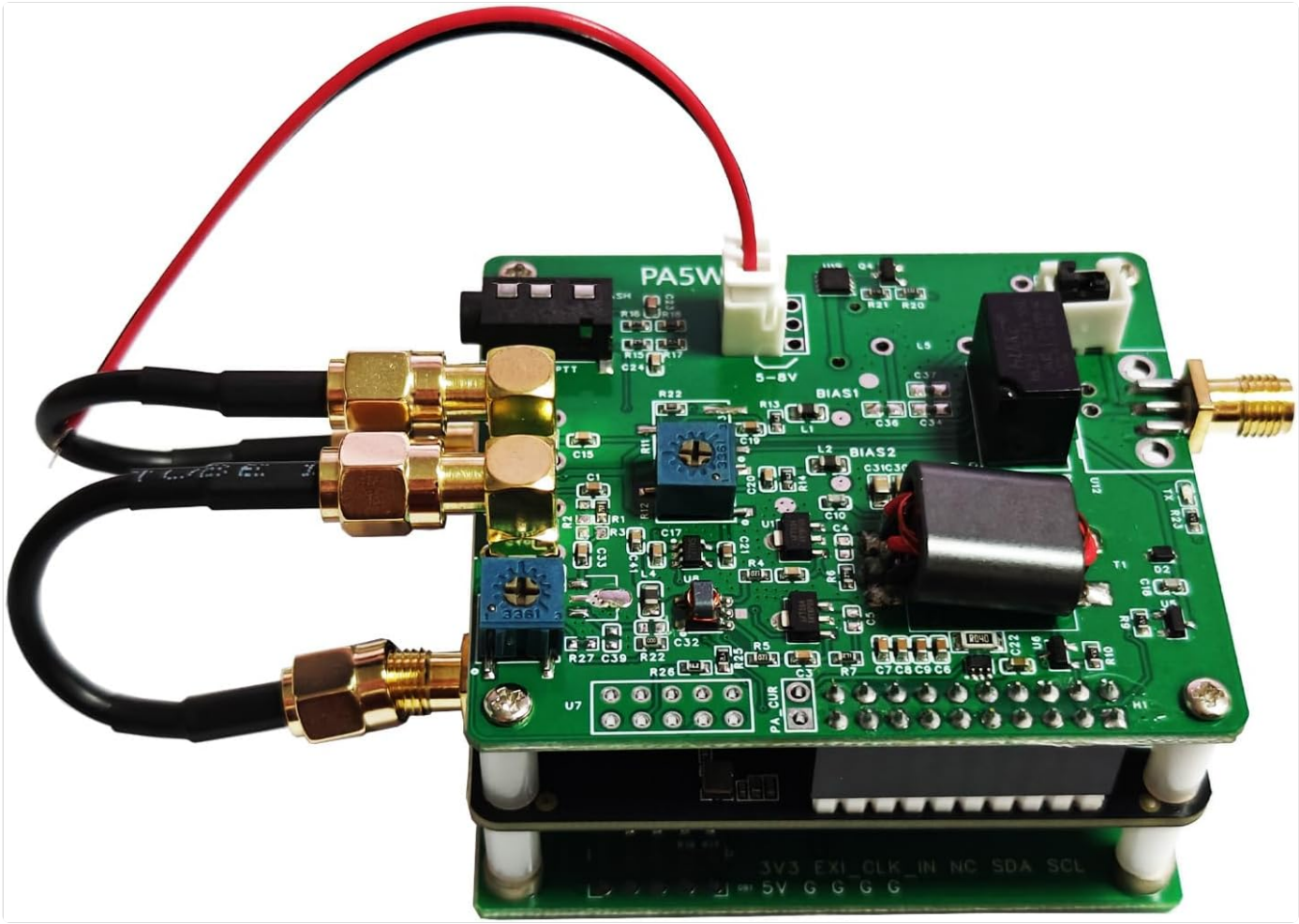

Figure 3.2: The preamp board with SMA cables connected for transmit, receive, and antenna. This shows the typical cabling configuration for operation.

4. Operating Instructions

Once the hardware is set up, configure your software for optimal performance. The board supports SSB, FM, and AM modes across an RF range of 1MHz to 50MHz.

4.1. Software Configuration (SparkSDR Example)

For software-defined radio applications like SparkSDR, specific settings are required to enable and utilize the preamp board's amplification capabilities:

1. **Enable PA:** Navigate to the Radio Settings within SparkSDR. Under the "PA" or "Power Amplifier" tab, ensure the "Enable PA" option is checked.

Figure 4.1: SparkSDR interface highlighting the "Enable PA" checkbox in the Radio Settings.

2. **Adjust Drive and Hang Time:** In the General Radio Settings, locate and adjust the "drive" and "PTT hang time" parameters as needed for your specific operation and desired output.

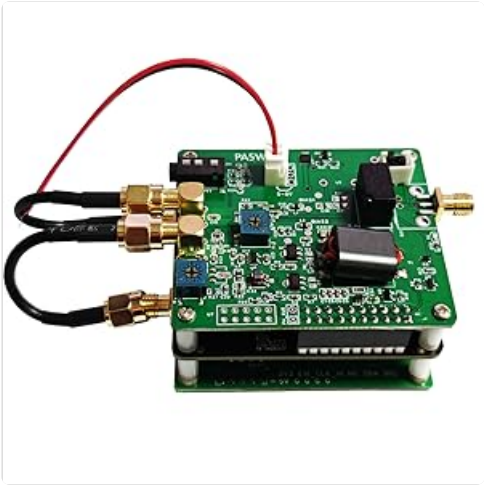

Figure 4.2: SparkSDR interface showing the "drive" and "hang" time settings under General Radio Settings.

4.2. Bias Voltage Adjustment

For prolonged continuous transmission, it is crucial to adjust the bias voltage. A safe range for the bias voltage is **2.4V–2.5V**. Refer to the schematic diagram or specific documentation for the exact adjustment points on the board.

5. Maintenance and Best Practices

To ensure the longevity and optimal performance of your Radioberry Preamp Board V2, consider the following maintenance tips:

- **Heat Dissipation:** For better performance and to prevent overheating during prolonged use, especially with continuous transmission modes, it is highly recommended to add a small fan for active heat dissipation.
- **Bias Voltage Monitoring:** Regularly monitor and adjust the bias voltage to stay within the recommended 2.4V–2.5V range, particularly if you engage in extended transmission periods.
- **Cleanliness:** Keep the board free from dust and debris. Use compressed air or a soft brush for cleaning.

6. Troubleshooting

If you encounter issues with your Radioberry Preamp Board V2, consider the following troubleshooting steps:

- **No Power Output/Amplification:**
  - Verify all power connections and ensure the input voltage is within the 6-8V (8.4V preferred) range.
  - Check SMA cable connections for proper seating and continuity.
  - Confirm that the "Enable PA" option is activated in your SDR software (e.g., SparkSDR).
  - Inspect the board for any visible damage or loose components.
- **Software Display Issues (e.g., "Weird Rainbow", "Dead Waterfall"):**
  - Ensure you are using the correct and compatible software version for your Radioberry and preamp board.
  - Try reinstalling the SDR software or even the Raspberry Pi operating system if issues persist.
  - Refer to the official Radioberry documentation and community forums for specific software configuration guides.
- **Overheating:**
  - Ensure adequate ventilation around the board.
  - Install a small cooling fan as recommended in the Maintenance section.

- Check and adjust the bias voltage to the safe range of 2.4V–2.5V.

For detailed setup and operational guides, including specific test images for reception, refer to the official documentation provided by the manufacturer:

How to Work Guide

Download Dedicated Test Image

7. Specifications

Feature	Specification
Model Name	Radioberry Preamp Board V2
Power Input	6-8V (8.4V preferred)
HF Power Input	Tx from Radioberry
HF Power Output	3-5W (for 10W-100W PA amplification)
RF Range	1MHz-50MHz
Supported Modes	SSB, FM, AM
Port Type	Input SMA, Output SMA
Compatible with	Raspberry Pi 4, 4B
Item Weight	2.02 ounces
Product Dimensions (LxWxH)	3.14 x 1 x 3.14 inches
Color	Green
Operating System (for Pi)	Linux

7.1. Output Power Comparison (V1 vs V2)

The V2 version of the preamp board offers enhanced output power compared to its predecessor:

- **V1 Output Power:** 1W to 3W
- **V2 Output Power:** Over 3W, typically 3W-5W

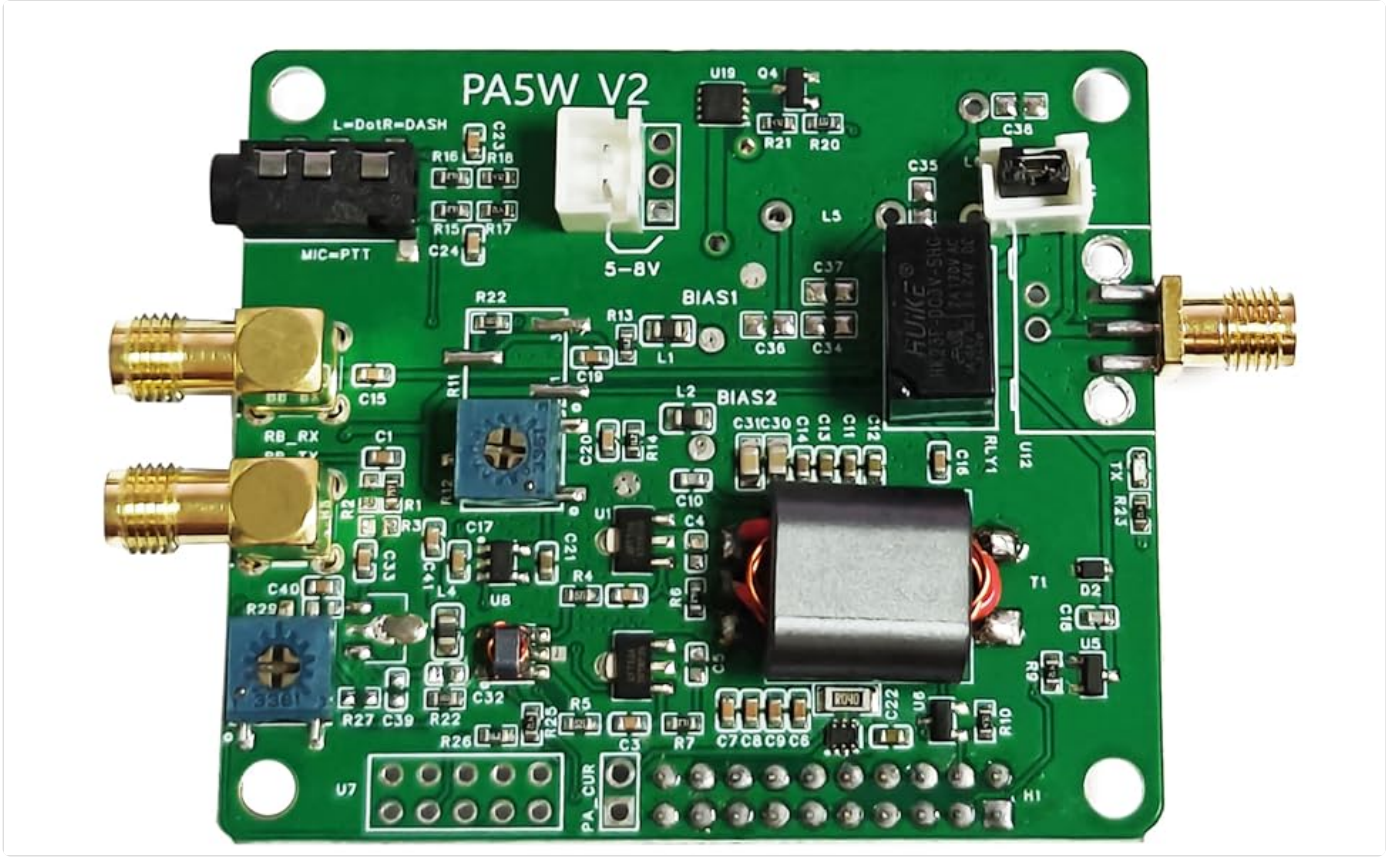

Figure 7.1: A visual comparison indicating the difference in output power between the V1 and V2 versions of the Radioberry Preamp Board.

FREQ(M)	input PP	Output Power	PA BIAS	DC in	PA Curr Vout(V)	PA Current_A)	AFT05MS_MOS temp
29	8V	4W	2.7V bias	8V DC	3	1.5	90° to 120°
24	8V	4W	2.7V bias	8V DC	2.7	1.35	90° to 120°
21	8V	4W	2.7V bias	8V DC	2.6	1.3	90° to 120°
18	8V	5W	2.7V bias	8V DC	2.5	1.25	90° to 120°
14	8V	5.3W	2.7V bias	8V DC	2.5	1.25	90° to 120°
10	8V	5.4W	2.7V bias	8V DC	2.5	1.25	90° to 120°
7	8V	5.4W	2.7V bias	8V DC	2.5	1.25	90° to 120°
5	8V	4.9W	2.7V bias	8V DC	2.6	1.3	90° to 120°
3	8V	4.6W	2.7V bias	8V DC	2.6	1.3	90° to 120°
1	8V	4.4W	2.7V bias	8V DC	2.5	1.25	90° to 120°

Figure 7.2: A table detailing typical output power, bias, current, and temperature ranges for the Radioberry Preamp Board V2 across various frequencies.

8. Support

For further assistance, technical inquiries, or support regarding your AURSINC Radioberry Preamp Board V2, please contact AURSINC customer support. You can find contact information or a support portal on the official AURSINC website or through your purchase platform.

AURSINC is dedicated to providing professional measurement tools and electronic products and offers customer support to assist with any questions or concerns.

Related Documents

	[NanoVNA Resources: Firmware, Software, and User Guides] Find essential resources for the NanoVNA, including firmware downloads, VNA-QT software, NanoVNA-Saver, and user guides. Access the latest updates and community information.