

ODEKTOOY ZK-TB21

ODEKTOOY ZK-TB21 2.1 Channel Audio Power Amplifier Board User Manual

Model: ZK-TB21

1. INTRODUCTION

The ODEKTOOY ZK-TB21 is a high-performance 2.1 channel audio power amplifier board designed for various audio applications. It features dual TPA3116D2 chips, offering a maximum output of 50W+50W for stereo channels and 100W for the subwoofer channel. With Bluetooth 5.1 and 3.5mm AUX inputs, it provides versatile connectivity options. Independent treble, bass, and subwoofer frequency adjustments allow for personalized sound tuning.

2. SAFETY INFORMATION

- Ensure the power supply voltage is within the specified range of DC 12-24V. Using an incorrect voltage can damage the device.
- Connect all speakers and audio sources before applying power to the amplifier board.
- Avoid short-circuiting the output terminals.
- Do not expose the device to moisture or extreme temperatures.
- Keep the device away from children.
- The PCB may contain leaded solder. Wash hands after handling and avoid direct contact with mouth.

3. PRODUCT FEATURES

- **Dual TPA3116 Chip:** Equipped with two TPA3116D2 chips for stereo 2.1 channel output (50W+50W+100W).
- **Wide Voltage Input:** Supports DC 12-24V power input.
- **Connectivity:** Bluetooth 5.1 and 3.5mm AUX inputs.
- **Audio Adjustment:** Independent treble, bass, and subwoofer frequency adjustment knobs.
- **Protection Functions:** Includes short-circuit, over-current, and over-heat protection mechanisms.
- **Efficient Heat Dissipation:** Features a large heat sink for continuous and efficient operation.

4. PRODUCT OVERVIEW AND COMPONENTS

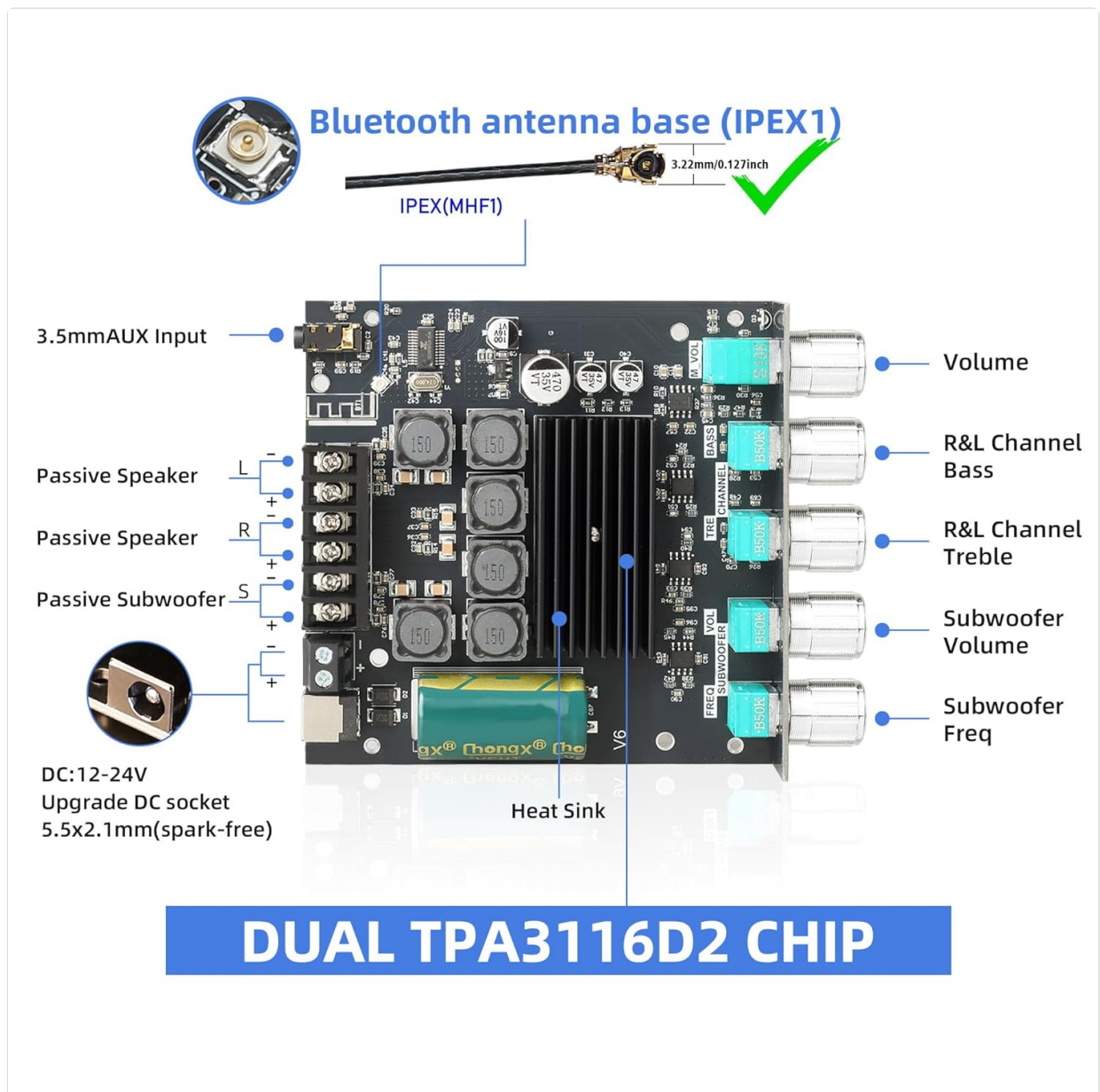


Figure 1: ZK-TB21 Amplifier Board Component Layout. This image shows the various input and output terminals, control knobs, the heat sink, and the Bluetooth antenna base (IPEX1).

- **Bluetooth Antenna Base (IPEX1):** For connecting an external Bluetooth antenna.
- **3.5mm AUX Input:** Audio input jack for wired connections.
- **Passive Speaker Terminals (L/R):** Screw terminals for connecting left and right passive speakers.
- **Passive Subwoofer Terminal (S):** Screw terminals for connecting a passive subwoofer.
- **DC 12-24V Power Input:** 5.5x2.1mm DC socket for power supply.
- **Heat Sink:** Dissipates heat from the amplifier chips.
- **Control Knobs:** Volume, R&L Channel Bass, R&L Channel Treble, Subwoofer Volume, Subwoofer Freq.

5. SETUP INSTRUCTIONS

5.1 Power Supply Connection

1. Ensure the amplifier board is powered off.
2. Connect a DC 12-24V power adapter (5A or above recommended) to the DC input socket on the board.

5.2 Speaker Connections

1. Connect your passive left and right speakers to the 'Passive Speaker L' and 'Passive Speaker R' screw terminals, observing polarity (+ and -).
2. Connect your passive subwoofer to the 'Passive Subwoofer S' screw terminals, observing polarity (+ and -).
3. Ensure all speaker wires are securely fastened and do not touch each other to prevent short circuits.

5.3 Audio Input Connection



Figure 2: Connecting an audio source using the 3.5mm AUX input.



Figure 3: Connecting an audio source wirelessly via Bluetooth 5.1.

5.3.1 AUX Input

- Connect your audio source (e.g., smartphone, TV, laptop) to the 3.5mm AUX input jack on the amplifier board using an audio cable.

5.3.2 Bluetooth Input

- Ensure the amplifier board is powered on.
- On your audio source device, enable Bluetooth and search for available devices.
- Select "ZK-TB21" from the list of devices to pair. A confirmation sound may indicate successful pairing.
- For optimal Bluetooth performance, consider connecting an external Bluetooth antenna to the IPEX1 base.

6. OPERATING INSTRUCTIONS

6.1 Power On/Off

- Connect the power adapter to a wall outlet to power on the board.
- Disconnect the power adapter from the wall outlet to power off the board.

6.2 Volume Control

- **Main Volume:** Adjust the overall output volume using the 'MAIN VOLUME' knob.
- **Subwoofer Volume:** Adjust the subwoofer output level using the 'SUBWOOFER VOLUME' knob.

6.3 Tone Control

- **R&L Channel Treble:** Adjust the high-frequency response of the main stereo channels.
- **R&L Channel Bass:** Adjust the low-frequency response of the main stereo channels.
- **Subwoofer Freq:** Adjust the cutoff frequency for the subwoofer output.

6.4 Input Selection

- The board features a physical switch for input method selection (BT/AUX). Toggle this switch to select between Bluetooth and 3.5mm AUX input.

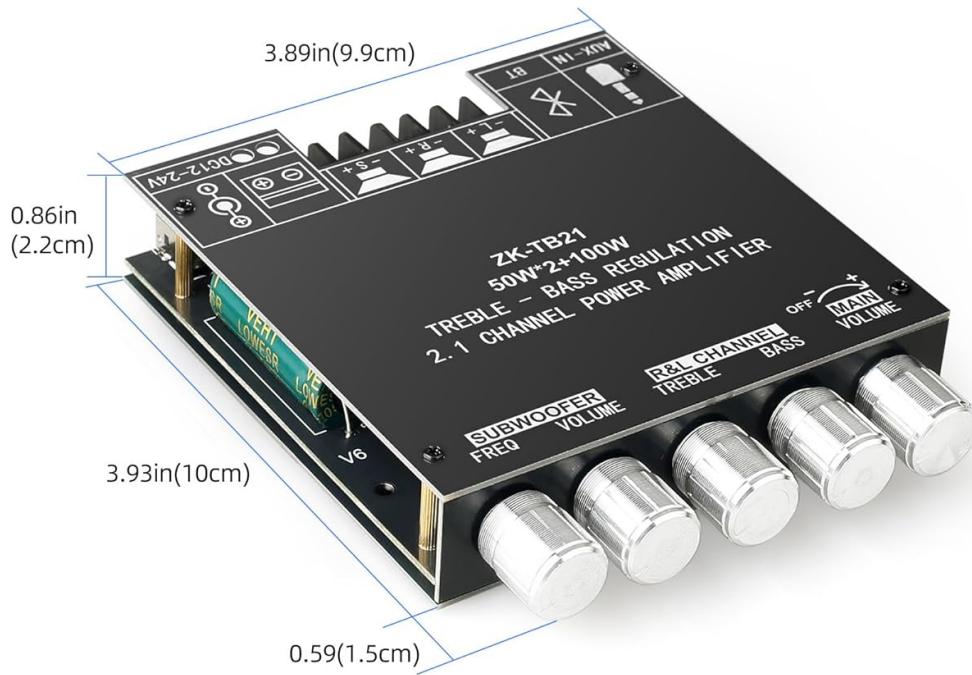
7. MAINTENANCE

- Keep the amplifier board clean and free from dust. Use a soft, dry cloth for cleaning.
- Do not use liquid cleaners or solvents.
- Ensure adequate ventilation around the board to prevent overheating, especially during prolonged use at high volumes.
- Regularly check all connections for security.

8. TROUBLESHOOTING

Problem	Possible Cause	Solution
No sound output	No power; incorrect input selected; loose speaker connections; audio source issue.	Check power supply; verify input selection (BT/AUX); ensure speaker wires are secure; test audio source.
Distorted sound	Volume too high; improper tone settings; weak power supply; speaker impedance mismatch.	Reduce volume; adjust treble/bass/subwoofer frequency; use a stronger power supply (e.g., 24V/5A); ensure speakers are 4-8Ω.
Bluetooth not connecting	Incorrect input mode; device not in pairing mode; interference; range issue.	Switch to Bluetooth input mode; ensure device is discoverable; reduce distance to amplifier; try re-pairing.
Overheating	Lack of ventilation; prolonged high-volume use; short circuit.	Ensure proper airflow; reduce volume; check for short circuits in wiring.

9. SPECIFICATIONS



Audio Input	Bluetooth+AUX
Input Voltage	DC12-24V/5A or above
Chip	Dual TPA3116D2 Chip
Channel	2.1 Channel
Adapted Speaker	20-100W,4-8Ω
Output Power	50W+50W+100W
Product Size	4.42x3.89x0.86in

Figure 4: Detailed specifications and power output table for the ZK-TB21 amplifier board.

Specification	Value
Model	ZK-TB21
Audio Input	Bluetooth + AUX
Input Voltage	DC 12-24V / 5A or above
Chip	Dual TPA3116D2 Chip
Channel	2.1 Channel
Adapted Speaker Impedance	4-8Ω
Output Power (Max)	50W (L) + 50W (R) + 100W (Subwoofer)
Product Dimensions (L x W x H)	4.42 x 3.89 x 0.86 inches (11.23 x 9.88 x 2.18 cm)
Item Weight	8.4 ounces (238 grams)

Power Output Table

DC Voltage	Channel	Output Power (Max)
12V	R & L	10W+10W @ 8Ω, 20W+20W @ 4Ω
	Subwoofer	10W @ 8Ω, 20W @ 4Ω
	Total	40W @ 4Ω
21V	R & L	25W+25W @ 8Ω, 50W+50W @ 4Ω
	Subwoofer	25W @ 8Ω, 50W @ 4Ω, 100W @ 2Ω
	Total	200W @ 4Ω
24V	R & L	30W+30W @ 8Ω
	Subwoofer	70W @ 4Ω
	Total	130W @ 4Ω

Note: When the input voltage is 24V, the impedance of the speakers must be greater than 4 ohms. If the speaker impedance is equal to 4 ohms, it is recommended to use a 19V DC power supply.

10. CUSTOMER SUPPORT

If you encounter any issues or have questions regarding the use of your ODEKTOOY ZK-TB21 amplifier board, please contact ODEKTOOY customer service for assistance. We are committed to providing satisfactory support.