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Wuzhi Audio ZK-AS21P

ZK-AS21P Bluetooth Amplifier Board User Manual

Model: ZK-AS21P | Brand: Wuzhi Audio

1. Introduction

This manual provides comprehensive instructions for the installation, operation, and maintenance of your Wuzhi Audio ZK-AS21P Bluetooth Amplifier Board. The ZK-AS21P is a high-performance 2.1-channel audio amplifier designed to deliver clear, powerful sound for various audio setups. Please read this manual thoroughly before using the product to ensure proper function and longevity.

2. Product Overview

The ZK-AS21P amplifier board integrates advanced audio technology to provide a superior listening experience. Key features include:

- **2.1-Channel Design:** Supports two passive speakers and one subwoofer for a full audio spectrum.
- **High-Fidelity Audio:** Powered by dual TPA3255 amplifier chips and six low-noise NE5532 preamplifiers for ultra-low distortion and crystal-clear HD audio.
- **Powerful Output:** Delivers 300W per channel (left/right) and 600W for the subwoofer.
- **Versatile Audio Inputs:** Supports Bluetooth 5.1, USB flash drives, USB sound card mode, and 3.5mm AUX input.
- **Advanced Protection:** Built-in safeguards against over/under-voltage, overheating, and short-circuit.
- **Efficient Cooling:** Features a whisper-quiet, long-life cooling fan for optimal heat dissipation.

2.1 Component Identification

Familiarize yourself with the various components and connection points of the ZK-AS21P amplifier board.

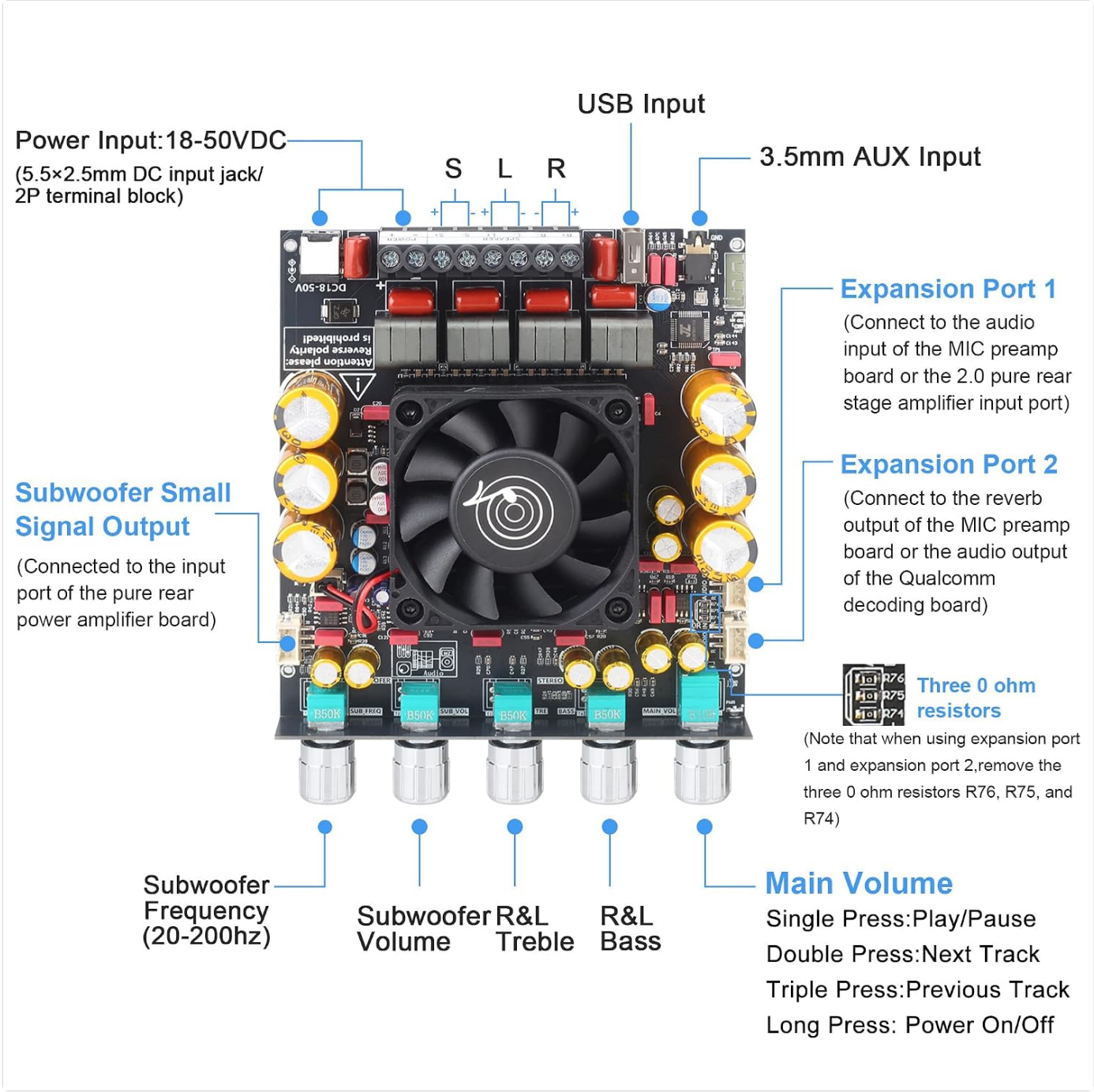


Figure 2.1: ZK-AS21P Amplifier Board Layout. This image displays the top view of the amplifier board, clearly labeling the power input, USB input, 3.5mm AUX input, subwoofer small signal output, expansion ports, and control knobs for subwoofer frequency, subwoofer R&L volume, R&L treble, R&L bass, and main volume.



Figure 2.2: Audio Input Modes. This image highlights the three primary audio input options available on the ZK-AS21P: Bluetooth 5.1, 3.5mm AUX input, and USB input (for USB sound card mode or flash drives).



Figure 2.3: Key Internal Components. This image details the upgraded 5.5*2.5mm DC socket for power input, the dual TPA3255 amplifier chips responsible for high-performance audio, and the large heat sink with an integrated cooling fan for efficient heat dissipation.

3. Setup Instructions

Follow these steps to properly set up your ZK-AS21P amplifier board.

3.1 Power Supply Connection

1. Ensure the amplifier board is disconnected from all other components before connecting power.
2. Connect a DC power supply (18-50V DC, 10A or higher recommended) to the "DC18-50V" input terminal or the 5.5x2.5mm DC jack.
3. **Important:** Observe correct polarity. Reverse polarity is prohibited and will damage the device. The board has built-in protection against reverse polarity, but always double-check connections.

3.2 Speaker Connection

Connect your passive speakers and subwoofer to the appropriate terminals.

- **Left/Right Speakers:** Connect your passive left and right speakers to the "L+" and "L-" terminals, and "R+" and "R-" terminals respectively.
- **Subwoofer:** Connect your passive subwoofer to the "S+" and "S-" terminals.
- Ensure speaker impedance is within recommended ranges for optimal performance and to prevent damage (refer to Specifications section).

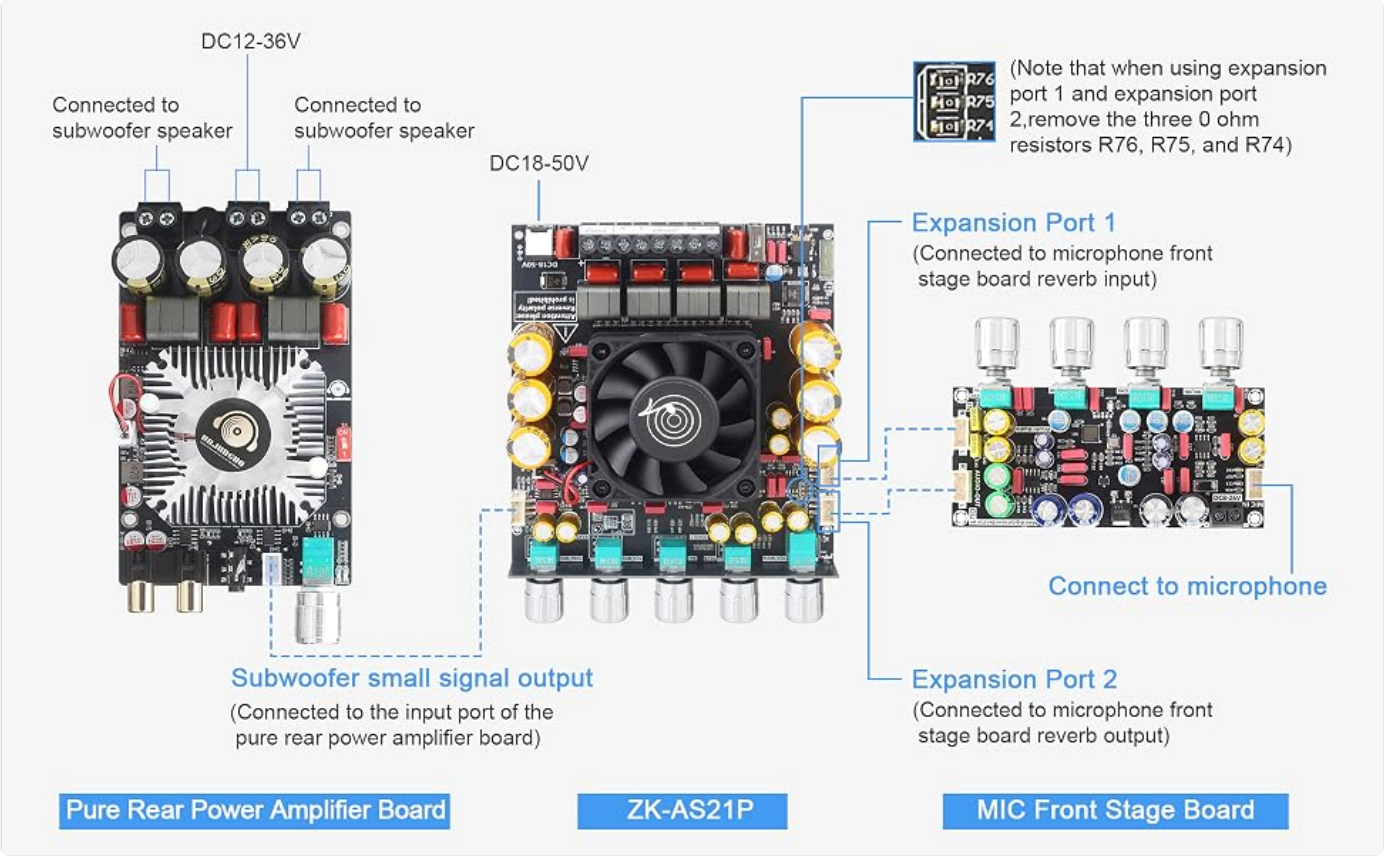


Figure 3.1: Connection Diagram. This diagram illustrates how to connect the ZK-AS21P to a pure rear power amplifier board via the subwoofer small signal output and to a MIC front stage board using Expansion Port 1 and Expansion Port 2. Note the instruction to remove three 0 ohm resistors (R76, R75, and R74) when using expansion port 1 and 2.

3.3 Audio Input Connection

Choose one of the following methods to connect your audio source:

- **Bluetooth 5.1:** Power on the board. The Bluetooth indicator will flash. Search for "ZK-AS21P" on your device and pair. The indicator will become solid blue upon successful connection.
- **3.5mm AUX Input:** Connect your audio source (e.g., smartphone, PC) to the 3.5mm AUX input jack using an audio cable.
- **USB Input (Flash Drive/Sound Card):** Insert a USB flash drive (FAT32 format, ≤32GB) into the USB port for direct playback. Alternatively, connect the USB port to a computer to use the board as a USB sound card.
- **Pro Tip:** When using the AUX input, ensure Bluetooth is disconnected for uninterrupted playback.



Figure 3.2: Multiple Audio Inputs. This image visually confirms the locations of the Bluetooth 5.1 antenna, 3.5mm AUX input, and USB input mode port on the amplifier board, illustrating the versatility of audio source connections.

4. Operating Instructions

Once connected, you can control the audio output using the onboard knobs.

- **Main Volume:** Controls the overall output volume.
    - Single Press: Play/Pause
    - Double Press: Next Track
    - Triple Press: Previous Track
    - Long Press: Power On/Off
- **Subwoofer R&L Volume:** Adjusts the volume of the subwoofer output.
- **R&L Treble:** Adjusts the high-frequency response of the left and right channels.
- **R&L Bass:** Adjusts the low-frequency response of the left and right channels.
- **Subwoofer Frequency (20-200Hz):** Fine-tunes the crossover frequency for the subwoofer, allowing you to optimize bass integration with your main speakers.

5. Maintenance

To ensure the longevity and optimal performance of your ZK-AS21P amplifier board, follow these maintenance guidelines:

- **Cleaning:** Use a soft, dry cloth to gently wipe the surface of the board. Do not use liquid cleaners or solvents.
- **Ventilation:** Ensure the cooling fan and heat sink areas are free from dust and obstructions to maintain proper airflow and heat dissipation.
- **Environment:** Operate the amplifier in a dry, well-ventilated environment, away from direct sunlight, excessive heat, and moisture.
- **Handling:** Handle the board with care to avoid damaging components. Avoid static discharge.

6. Troubleshooting

If you encounter issues with your ZK-AS21P amplifier board, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No sound output	Incorrect power supply voltage/current. Loose speaker connections. Incorrect audio input selected or source issue. Volume too low.	Verify power supply meets 18-50V DC, 10A+ requirements. Check all speaker wire connections for proper polarity and secure fit. Ensure the correct audio input mode is active (Bluetooth, AUX, USB) and the source is playing. Disconnect Bluetooth if using AUX. Increase main volume and individual channel volumes.
Bluetooth connection issues	Device too far from amplifier. Interference. Bluetooth not in pairing mode.	Ensure device is within 15m range. Reduce interference from other wireless devices. Power cycle the amplifier board to re-enter pairing mode.
Distorted sound	Input signal too strong. Speaker impedance mismatch. Power supply insufficient.	Reduce the volume on your audio source. Verify speaker impedance is compatible (refer to specifications). Ensure power supply can deliver sufficient current.
Amplifier shuts off unexpectedly	Overheating. Over/under-voltage protection activated. Short-circuit detected.	Check for proper ventilation around the heat sink and fan. Verify power supply voltage is within 18-50V DC. Inspect speaker wires and connections for any short circuits.

7. Specifications

Feature	Detail
Model Number	ZK-AS21P
Channels	2.1 (Left, Right, Subwoofer)
Amplifier Chip	Dual TPA3255
Preamplifiers	Six NE5532
Power Output (Peak)	300W (Left) + 300W (Right) + 600W (Subwoofer)
Power Supply Range	DC 18V-50V (Recommended: ≥10A)
Audio Inputs	Bluetooth 5.1, 3.5mm AUX, USB (Flash Drive/Sound Card)
Bluetooth Range	<15 meters (unobstructed)
Protection Features	Input undervoltage, overvoltage, overheating, overcurrent, short circuit protection. No input anti-reverse protection (positive and negative poles cannot be reversed).

Feature	Detail
Product Dimensions (L x W x H)	150mm x 120mm x 40mm (approx. 5.91 x 4.72 x 1.57 inches)
Item Weight	12.35 ounces

7.1 Output Power Table (@1KHz)

The following table details the typical output power under various DC voltage and speaker impedance conditions.

ZK-AS21P Output Power Table(@1KHZ)

ZK-AS21P---------Test Conditions：1khz			
DC Voltage	Channel	speaker impedance	Power Output
24V	R & L	8Ω	30W+30W
		4Ω	70W+70W
	SUB	8Ω	30W
		4Ω	70W
		2Ω	150W
36V	R & L	8Ω	80W+80W
		4Ω	160W+160W
	SUB	8Ω	80W
		4Ω	160W
		2Ω	350W
50V	R & L	8Ω	160W+160W
		4Ω	300W+300W
	SUB	8Ω	160W
		4Ω	300W
		2Ω	600W
If the input voltage is 50V, the speaker impedance for the left and right channels must be greater than or equal to 4 ohms, and the subwoofer channel impedance must be greater than or equal to 2 ohms.			

Figure 7.1: ZK-AS21P Output Power Table. This table provides detailed power output specifications at 1KHz, showing how power varies with DC input voltage (24V, 36V, 50V), channel (R&L, SUB), and speaker impedance (8Ω, 4Ω, 2Ω). It also notes that if the input voltage is 50V, the speaker impedance for R&L channels must be ≥4 ohms, and the subwoofer channel impedance must be ≥2 ohms.

8. Support and Contact

For further assistance, technical support, or inquiries regarding your Wuzhi Audio ZK-AS21P amplifier board, please contact your retailer or the manufacturer directly. Refer to your purchase documentation for specific contact information.

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