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› DAJUNGUO ZK-ST21 TPA3221 Bluetooth Power Amplifier Board User Manual

DAJUNGUO ZK-ST21

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Model: ZK-ST21

INTRODUCTION

This manual provides detailed instructions for the proper setup, operation, and maintenance of your DAJUNGUO ZK-ST21 TPA3221 Bluetooth Power Amplifier Board. Please read this manual thoroughly before use to ensure safe and efficient operation.

SAFETY INFORMATION

- Ensure the power supply voltage is within the specified range (DC 12-30V).
- Avoid short circuits during wiring.
- Do not expose the board to moisture or extreme temperatures.
- Keep out of reach of children.
- Disconnect power before making any connections or adjustments.

PRODUCT OVERVIEW

The ZK-ST21 is a 2.1 channel Bluetooth power amplifier board featuring the TPA3221 HIFI chip, offering 100W x 2 + 200W output. It supports multiple input methods including Bluetooth, AUX, and USB drive, and provides treble and bass control for a customized audio experience.



Figure 1: DAJUNGUO ZK-ST21 TPA3221 Bluetooth Power Amplifier Board with screwdriver for assembly.

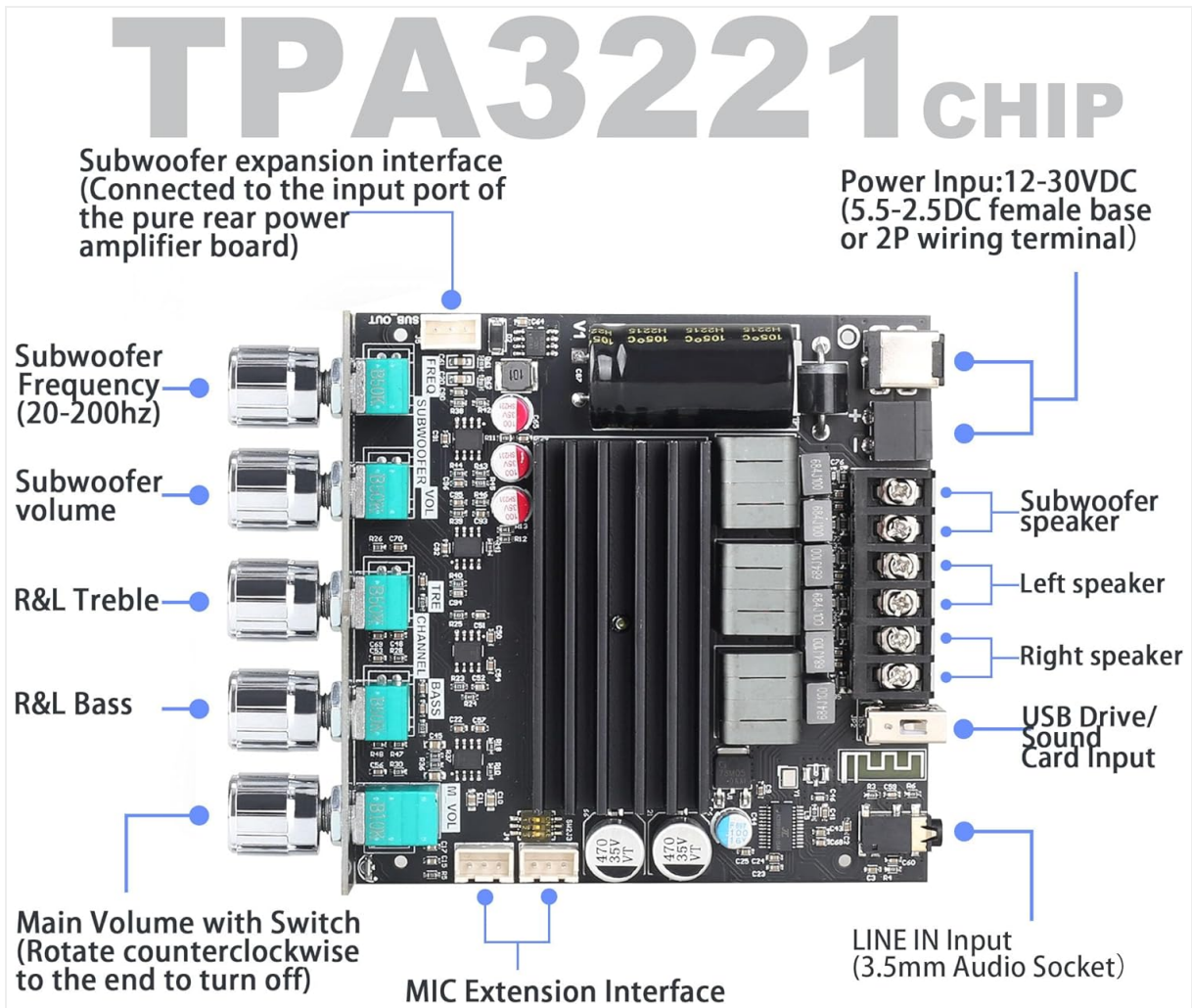


Figure 2: Detailed view of the ZK-ST21 amplifier board, highlighting power input, subwoofer frequency and volume controls, R&L channel treble and bass controls, main volume, speaker outputs (subwoofer, left, right), USB drive/sound card input, and LINE IN (3.5mm Audio Socket).

SPECIFICATIONS

Feature	Detail
Model	ZK-ST21
Amplifier Chip	2x TPA3221 HIFI Chip
Channels	2.1 Channel (Left, Right, Subwoofer)
Output Power (Peak)	100W (Left) + 100W (Right) + 200W (Subwoofer)
Input Voltage	DC 12-30V (Recommended: 24V-28V, 10A or above)
Input Methods	Bluetooth, AUX (3.5mm), USB Drive
Adapted Speakers (L&R)	3-8Ω, up to 100W per channel
Adapted Subwoofer	2-8Ω, up to 200W
Bluetooth Version	JieLi 5.1
Bluetooth Transmission Distance	Up to 15 meters
Protection Mechanisms	Input undervoltage, input anti-reverse connection, overheating, overcurrent, short circuit protection
Product Dimensions	4.76 x 3.93 x 0.98 inches (121 x 100 x 25 mm)
Item Weight	10.2 ounces

Input Method

Bluetooth+AUX+USB disk/sound card

Power AMP Chip

Two TI original TPA3221

Adapted Power Supply

The working voltage range is 12-30VDC, and it is recommended to use a DC power supply with a voltage of 24V-28V and a current of 10A or above.

Adapted Speaker

Left and right channels, supporting 3-8 Ω , speakers up to 100W;
Subwoofer supports 2-8 Ω and speakers up to 200W.

Maximum Power

Left or right channel: --105W@30V, 4 Ω ; --55W@30V, 8 Ω
Subwoofer: --208W@30V, 2 Ω ; --105W@30V, 4 Ω .

In short, the higher the voltage, the smaller the resistance, and the greater the output power.

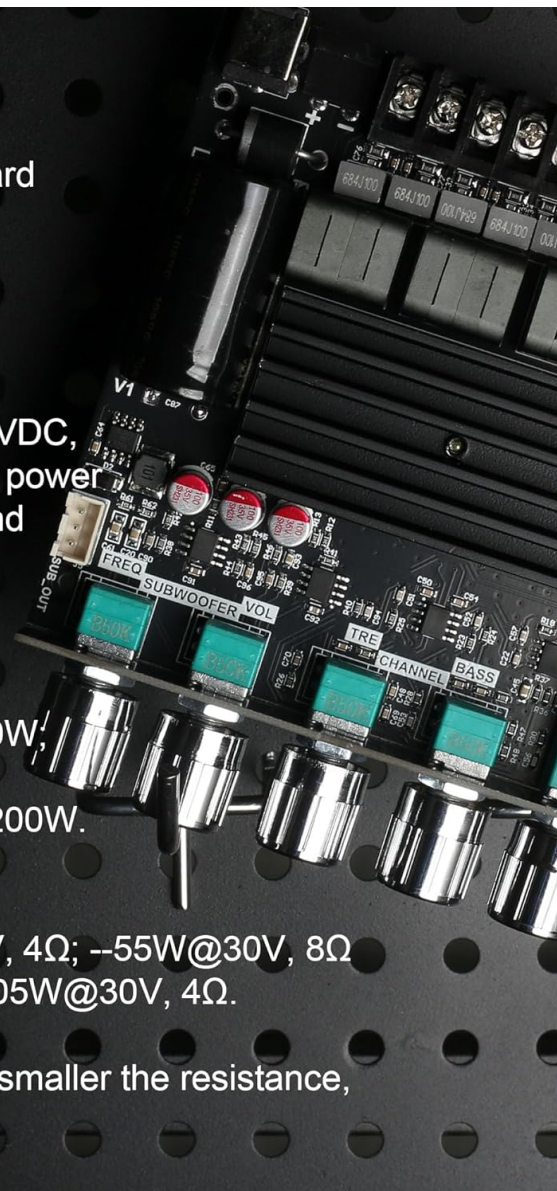


Figure 3: Key specifications including adapted power supply, speaker requirements, and maximum power output.

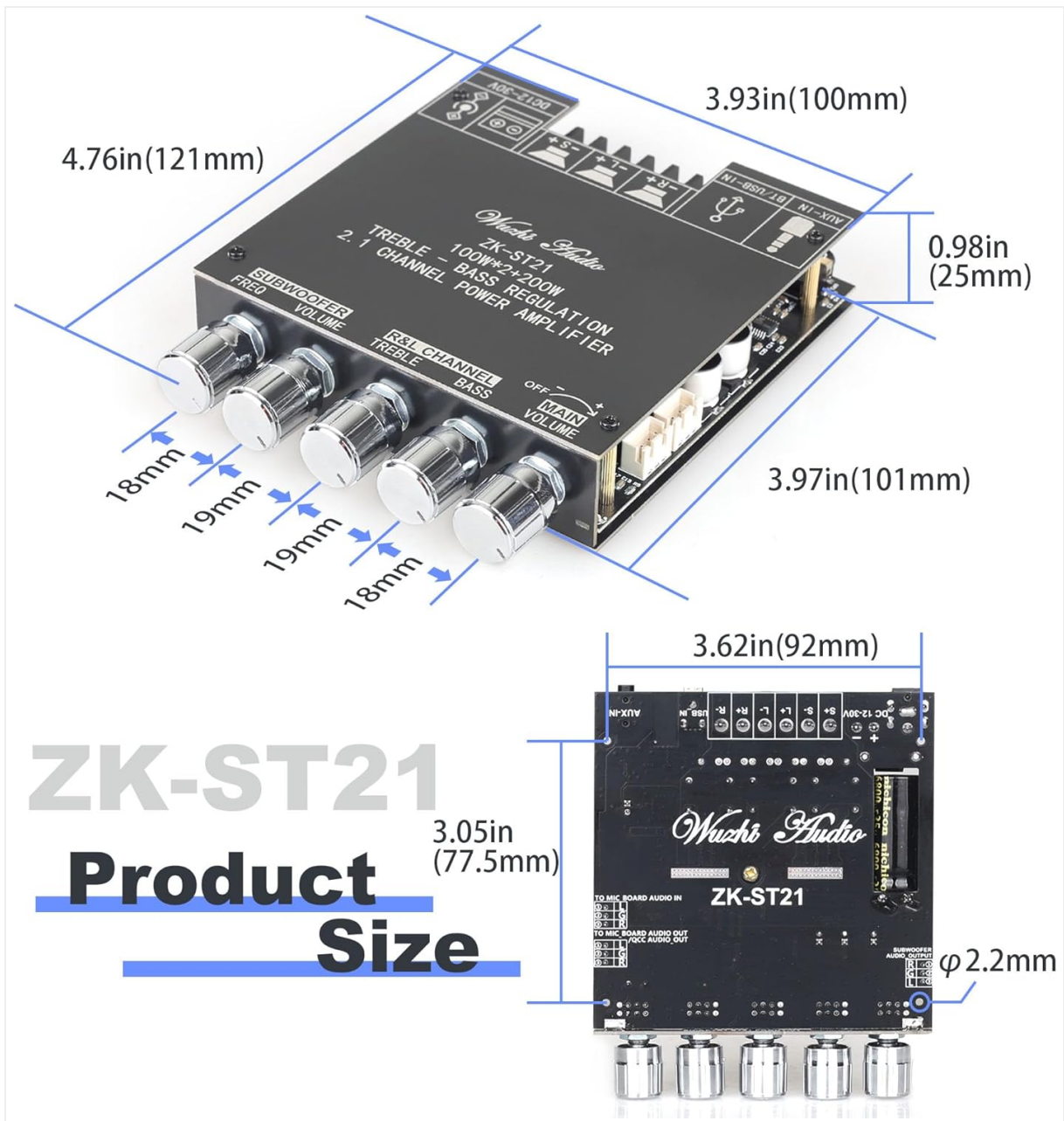


Figure 4: Product dimensions of the ZK-ST21 amplifier board.

SETUP

1. Power Supply Connection

Connect a DC 12-30V power supply to the DC input port. Ensure the power supply can provide sufficient current, especially for higher output power (recommended 10A or above for 24V-28V). The board features an upgraded DC socket to prevent sparks.

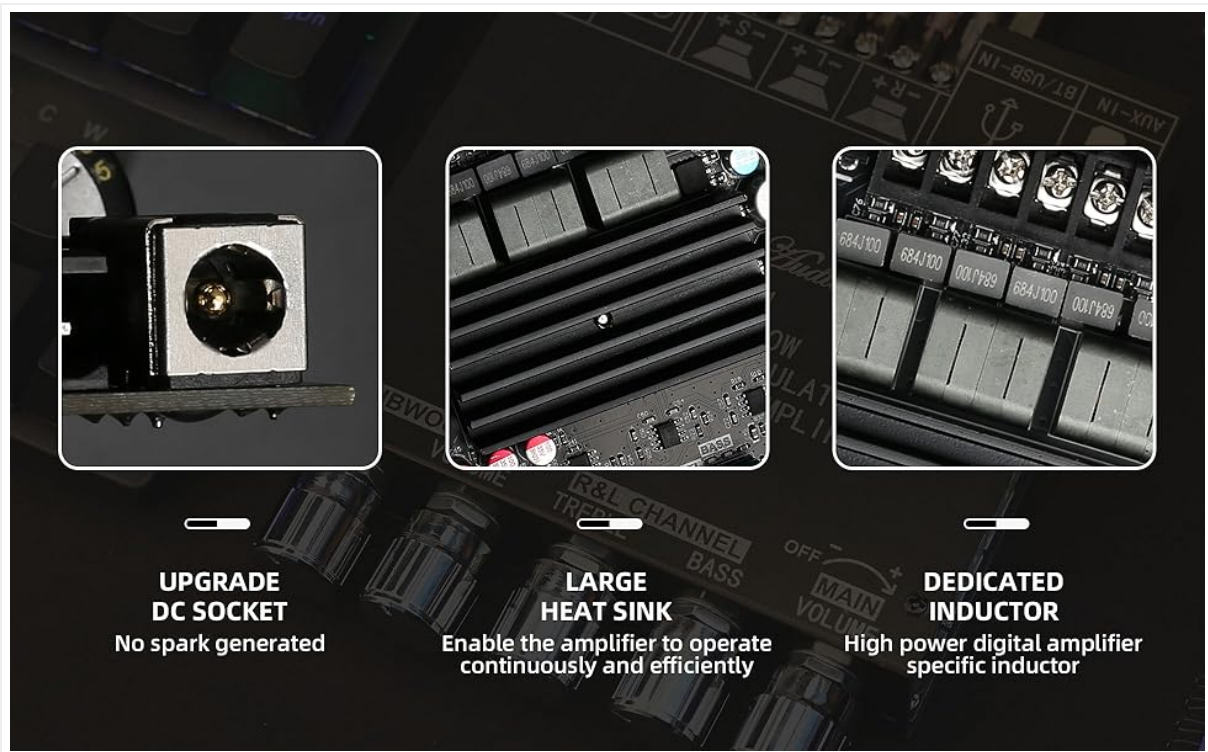


Figure 5: Features like the upgraded DC socket, large heat sink, and dedicated inductors for stable operation.

2. Speaker Connection

Connect your left and right channel speakers to the "R+ R-" and "L+ L-" terminals respectively. Connect your subwoofer to the "S+ S-" terminals. Ensure correct polarity (+ to + and - to -) for optimal sound. The board supports 3-8 Ω speakers for L&R channels (up to 100W each) and 2-8 Ω subwoofers (up to 200W).

3. Input Method Selection

The ZK-ST21 supports three input methods:

- **Bluetooth Input:** Power on the device. The amplifier will automatically enter Bluetooth pairing mode. Search for "ZK-ST21" on your device's Bluetooth settings and connect.
- **AUX Input:** Connect your audio source (e.g., phone, TV, laptop) to the 3.5mm AUX input jack using an audio cable.
- **USB Drive Input:** Insert a USB flash drive (FAT32 format, up to 32GB) into the USB port. The amplifier will automatically play audio files from the drive.



2.1 CHANNELS

Bluetooth Amplifier Board

100W+100W+200W

Bluetooth/3.5mm AUX/USB Input

2xTPA3221 Chip

MIC Extension Interface

Subwoofer Expansion Interface

Figure 6: The amplifier board supports Bluetooth, 3.5mm AUX, and USB inputs for versatile connectivity.



MULTIPLE INPUT MODE

Bluetooth

You can change the Bluetooth name and password through the App

3.5mm Aux

Can be connected to computer, TV, MP3, etc.

USB Mode

USB flash disk is FAT32 ($\leq 32GB$).

Figure 7: Demonstrating the multiple input modes available on the ZK-ST21 amplifier board.

4. Advanced Connections (Optional)

The ZK-ST21 features interfaces for expansion:

- **Subwoofer Expansion Interface:** Connects to the input port of an additional pure rear power amplifier board for enhanced subwoofer performance.
- **MIC Extension Interface:** Allows connection of a ZK-AMP MIC front stage board (additional purchase required). When using this interface, the dial switch on the amplifier must be turned to the OFF position.

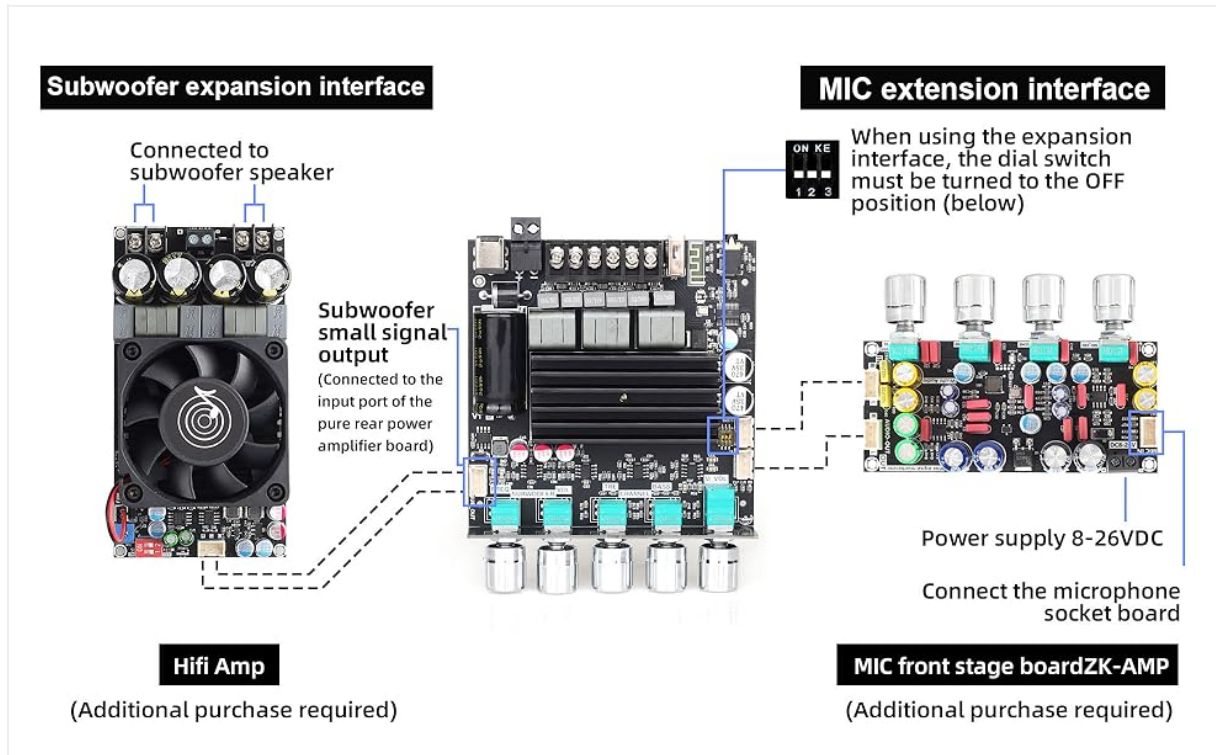


Figure 8: Subwoofer expansion and MIC extension interfaces for advanced audio setups.

OPERATING INSTRUCTIONS

1. Power On/Off

Rotate the "MAIN VOLUME" knob clockwise to power on the amplifier. Rotate it counter-clockwise until it clicks to power off.

2. Volume Control

- **Main Volume:** Adjust the "MAIN VOLUME" knob to control the overall output volume.
- **Subwoofer Volume:** Use the "SUBWOOFER VOLUME" knob to adjust the volume level of the subwoofer independently.

3. Tone Control

- **R&L Channel Treble:** Adjust the "R&L CHANNEL TREBLE" knob to increase or decrease high frequencies for the main speakers.
- **R&L Channel Bass:** Adjust the "R&L CHANNEL BASS" knob to increase or decrease low frequencies for the main speakers.
- **Subwoofer Frequency:** Use the "SUBWOOFER FREQ" knob to set the crossover frequency for the subwoofer (20-200Hz). This determines which low frequencies are sent to the subwoofer.

MAINTENANCE

- **Cleaning:** Use a soft, dry cloth to clean the amplifier board. Do not use liquid cleaners or solvents.
- **Storage:** Store the device in a cool, dry place away from direct sunlight and excessive dust when not in use.
- **Ventilation:** Ensure adequate ventilation around the amplifier board to prevent overheating. The large heat sink is designed for continuous operation, but proper airflow is still important.

TROUBLESHOOTING

Problem	Possible Cause	Solution
Amplifier does not power on.	No power supply, incorrect voltage, main volume knob off.	Check power adapter connection. Ensure power supply is within DC 12-30V. Rotate main volume knob clockwise until it clicks.
No sound output.	Incorrect input selected, loose speaker wires, low volume, faulty audio source.	Verify input method (Bluetooth, AUX, USB). Check all speaker connections for proper polarity and secure fit. Increase main volume and individual channel/subwoofer volumes. Test with a different audio source.
Distorted sound.	Volume too high, impedance mismatch, poor quality audio source, damaged speakers.	Reduce volume. Ensure speakers and subwoofer match the recommended impedance (3-8Ω for L&R, 2-8Ω for subwoofer). Use a high-quality audio source. Check speakers for damage.
Bluetooth connection issues.	Device too far, interference, amplifier not in pairing mode.	Ensure device is within 15 meters. Reduce interference from other wireless devices. Power cycle the amplifier to re-enter pairing mode.
Overheating.	Poor ventilation, excessive load.	Ensure adequate airflow around the heat sink. Reduce volume or check speaker impedance. The board has built-in overheating protection.

WARRANTY AND SUPPORT

DAJUNGUO products are designed for reliability and performance. For specific warranty details, please refer to the product packaging or contact your retailer. If you encounter any issues or require technical assistance, please reach out to DAJUNGUO customer support through the contact information provided with your purchase or on the official DAJUNGUO website.

The manufacturer provides multiple protection mechanisms including short-circuit, over-current, over-heat, and anti-reverse protection to ensure safe operation and longevity of the device.