Walfront MKS TinyBee V1.0

Walfront MKS TinyBee V1.0 3D Printer Control Board Instruction Manual

Model: MKS TinyBee V1.0 | Brand: Walfront

1. Product Overview

The MKS TinyBee V1.0 is a versatile 3D printer control board designed for enhanced performance and wide compatibility. It integrates an ESP32-WROOM-32U module, featuring a dual-core 32-bit high-speed MCU operating at up to 240MHz. This board supports Marlin 2.0 firmware and offers connectivity options including network and web page control for your 3D printer.

Key features include:

- **Wide Compatibility:** Supports various LCD screens (LCD2004, 12864, MKS MINI12864 V3, MKS TFT serial port screens).
- **High Performance:** Equipped with ESP32-WROOM-32U module, dual-core 32-bit LX6 microprocessor, 8MB Flash, and 520KB RAM.
- **Integrated Connectivity:** Built-in Wi-Fi and Bluetooth modules for advanced control.
- **Easy Firmware Updates:** Firmware can be updated conveniently via USB.
- **Compact Design:** Lightweight and compact for easy installation.

Image 1: MKS TinyBee V1.0 3D Printer Control Board shown with a 3D printer.

2. Setup and Installation

This section provides guidance on installing and connecting your MKS TinyBee V1.0 control board. Please refer to the detailed diagram for component identification and connection points.

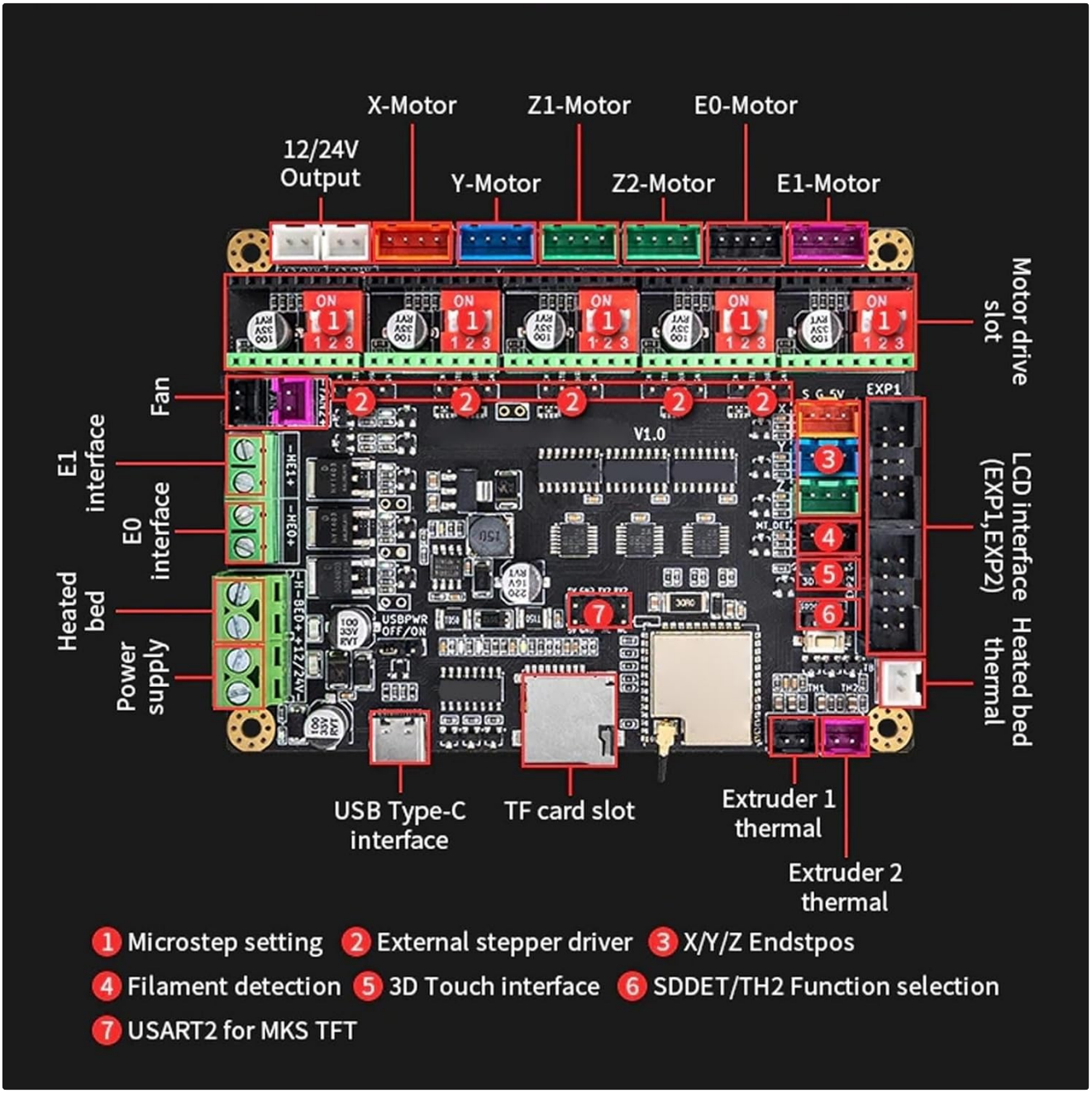

Image 2: Detailed diagram of the MKS TinyBee V1.0 control board with labeled connection points.

2.1 Component Identification

Before installation, familiarize yourself with the board's layout:

- **Motor Drivers:** X-Motor, Y-Motor, Z1-Motor, Z2-Motor, E0-Motor, E1-Motor.
- **End Stops:** X, Y, Z, MT_DET.
- **Power Supply:** DC 12-24V input.
- **Heated Bed:** Connection for heated bed.
- **Extruder Thermals:** Extruder 1 thermal, Extruder 2 thermal.
- **Fan Interfaces:** Fan, E1 interface, E0 interface.
- **LCD Interface:** EXP1, EXP2 for LCD screens.
- **USB Type-C Interface:** For firmware updates and communication.
- **TF Card Slot:** For storing G-code files.
- **3D Touch Control:** Dedicated interface.
- **Filament Detection:** Interface for filament runout sensor.

- **USART2:** Reserved for MKS TFT series screens.

2.2 Connection Procedure

Follow these steps to connect the board to your 3D printer:

1. **Power Supply:** Connect your DC 12-24V power supply to the designated power input terminals. Ensure correct polarity.
2. **Motor Connections:** Connect the X, Y, Z, E0, and E1 motors to their respective motor driver slots.
3. **End Stops:** Connect the X, Y, and Z end stop switches to their corresponding pins.
4. **Heated Bed & Extruder:** Connect the heated bed and extruder heating elements, along with their thermistors, to the appropriate terminals.
5. **Fans:** Connect cooling fans to the fan interfaces as needed.
6. **LCD Screen:** Connect your compatible LCD screen (e.g., MKS MINI12864 V3 or MKS TFT) to the EXP1/EXP2 or USART2 interfaces.
7. **Optional Connections:** Connect 3D Touch sensors, filament detection sensors, or other accessories to their dedicated interfaces.

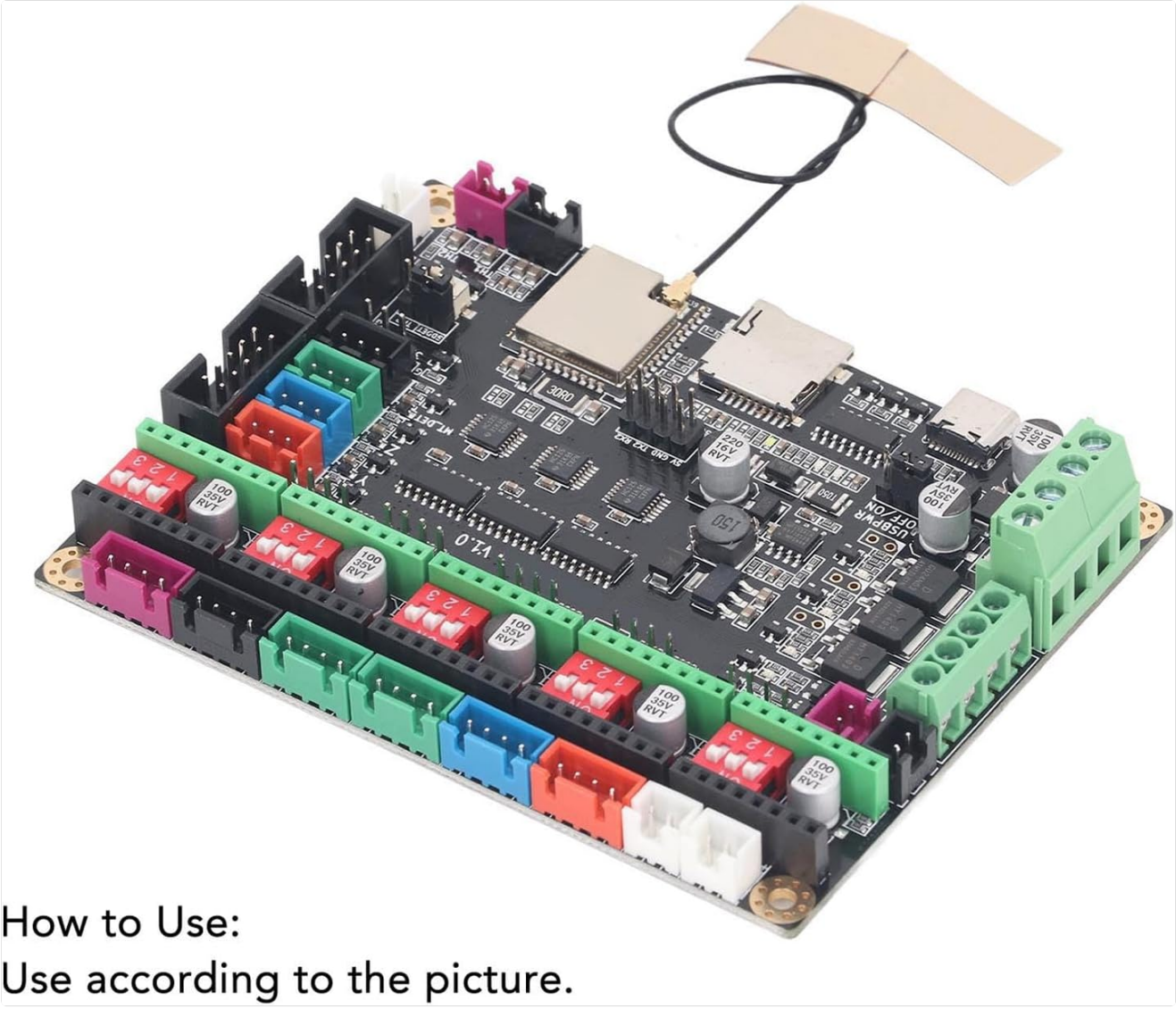

Image 3: General connection guidance for the MKS TinyBee V1.0 board.

2.3 Firmware Update

The MKS TinyBee V1.0 supports firmware updates via its USB Type-C interface. Connect the board to your computer using a USB cable and follow the instructions provided with the Marlin 2.0 firmware for ESP32-based

boards.

3. Operating Instructions

Once the MKS TinyBee V1.0 control board is correctly installed and powered, you can operate your 3D printer using a compatible LCD screen or through network/web page control.

3.1 Basic Operation via LCD

Navigate through the menus on your connected LCD screen to perform basic operations such as:

- Loading G-code files from the TF card.
- Initiating prints.
- Monitoring print progress.
- Adjusting temperatures (hotend, heated bed).
- Controlling motor movements (homing, jogging).

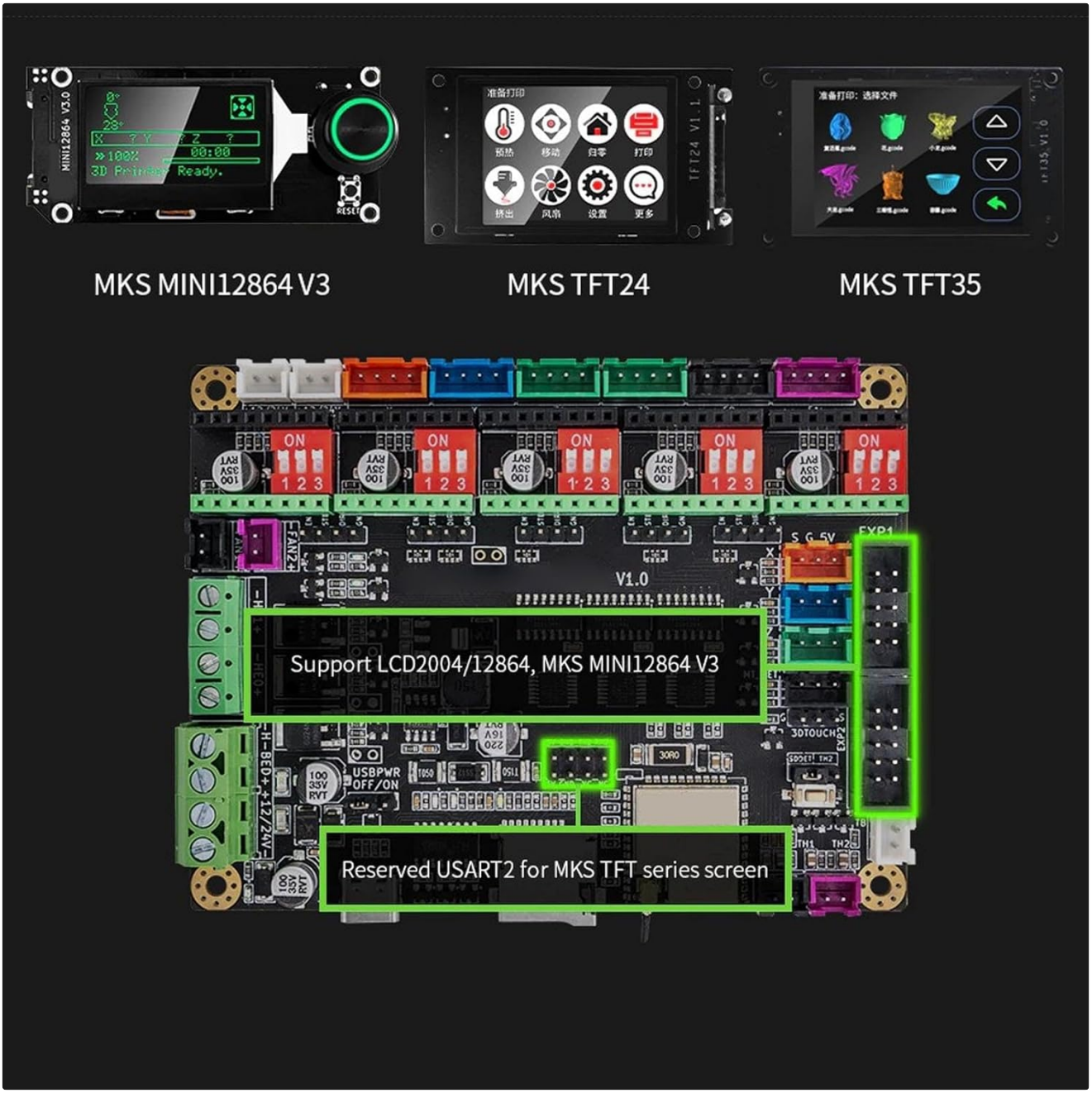

Image 4: MKS TinyBee V1.0 board supporting various LCD display types.

3.2 Network and Web Control

Leverage the integrated Wi-Fi module to connect your 3D printer to a network. This allows for remote control and monitoring via web pages, offering greater flexibility in managing your print jobs.

4. Maintenance

To ensure the longevity and optimal performance of your MKS TinyBee V1.0 control board, follow these maintenance guidelines:

- **Keep Clean:** Regularly clean the board to prevent dust accumulation, which can lead to overheating or short circuits. Use a soft brush or compressed air.
- **Secure Connections:** Periodically check all wire connections to ensure they are secure and free from corrosion. Loose connections can cause intermittent issues or damage.

- **Proper Ventilation:** Ensure the control board is installed in an environment with adequate ventilation to dissipate heat effectively.
- **Firmware Updates:** Keep the firmware updated to the latest stable version to benefit from bug fixes and new features.
- **Power Off Safely:** Always power off the 3D printer and disconnect the power supply before performing any maintenance or making changes to the wiring.

5. Troubleshooting

This section addresses common issues you might encounter with your MKS TinyBee V1.0 control board.

5.1 Board Not Powering On

If the board does not power on:

- **Check Power Supply:** Verify that the power supply is connected correctly and providing the specified DC 12-24V. Ensure the power supply itself is functional.
- **Inspect Wiring:** Double-check all power connections for proper polarity and secure contact.
- **USB Power:** If powering via USB, ensure the USB power jumper is correctly set (if applicable) and the USB cable is functional.
- **Fuses:** Inspect any onboard fuses for signs of being blown. If a fuse is blown, replace it with one of the same rating.

5.2 Motors Not Moving

If motors are not responding:

- **Motor Connections:** Ensure all motor cables are securely connected to the board and the motors.
- **Driver Configuration:** Verify that the stepper drivers are correctly installed and configured (e.g., microstep settings via dial switches).
- **Firmware Settings:** Check your Marlin firmware configuration for correct motor assignments and steps per millimeter.

5.3 Display Issues

If the LCD screen is not displaying correctly:

- **Cable Connections:** Ensure the display cables (EXP1, EXP2, or serial port) are correctly and securely connected to both the board and the display.
- **Firmware Support:** Confirm that your firmware is configured to support the specific type of LCD screen you are using.

6. Specifications

Detailed technical specifications for the MKS TinyBee V1.0 control board:

Product parameter

Board parameters	
MCU	ESP32-WROOM-32U
MCU Freq	240MHz
Flash	8192K
RAM	520K
Power input	Dc12~24V <20A
Heaters	2 heater end+ 1 Heater BED
Temp ADC	3 NTC100K: TH1, TB, TH2(Need jumper selection)
PWM Fans	2 Channel
Motor interface	5 axis 6 motor interface(Dual Z axis in parallel)
Stepper driver mode	STEP/DIR moode
Driver signal	Support external for high current drivers
Microstep settings	DIP switch
LCD interface	Support LCD2004/12864, MKS MINI12864 V3
Serial port	Reserved USART2 for MKS TFT series screen
Endstop	X, Y, Z, MT_DET
3D TOUCH	Support
Power protect	Support power reverse connection protection and power spike protection
Motor back electromotive force	Can be absorbed by the resistance of the phase sequence, and protect the stepper drive
Firmware	Marlin 2.0.x
Firmware update method	USB upload

Image 5: Product parameter table for MKS TinyBee V1.0.

MKS TinyBee V1.0 Board Parameters

Parameter	Value
MCU	ESP32-WROOM-32U
MCU Frequency	240MHz
Flash Memory	8192KBytes
RAM	520KBytes
Power Input	DC 12-24V <20A
Heaters	2 heater end + 1 Heater BED
Temp ADC	3 NTC100K: TH1, TB, TH2 (Need jumper selection)

Parameter	Value
PWM Fans	2 Channel
Motor Interface	5 axis 6 motor interface (Dual Z axis in parallel)
Stepper Drive Mode	STEP/DIR Mode
Driver Signal	Support external for high current drivers
Microstep Settings	DIP switch
LCD Interface	Support LCD2004/12864, MKS MINI12864 V3
Serial Port	Reserved USART2 for MKS TFT series screen
Endstop	X, Y, Z, MT_DET
3D Touch	Support
Power Protect	Support power reverse connection protection and power spike protection
Motor Back Electromotive Force	Can be absorbed by the resistance of the phase sequence, and protect the stepper drive
Firmware	For Marlin2.0.x
Firmware Update Method	USB upload

6.1 Physical Dimensions and Weight

- **Package Dimensions:** 6.54 x 5.47 x 2.09 inches
- **Item Weight:** 5.6 ounces (0.16 Kilograms)

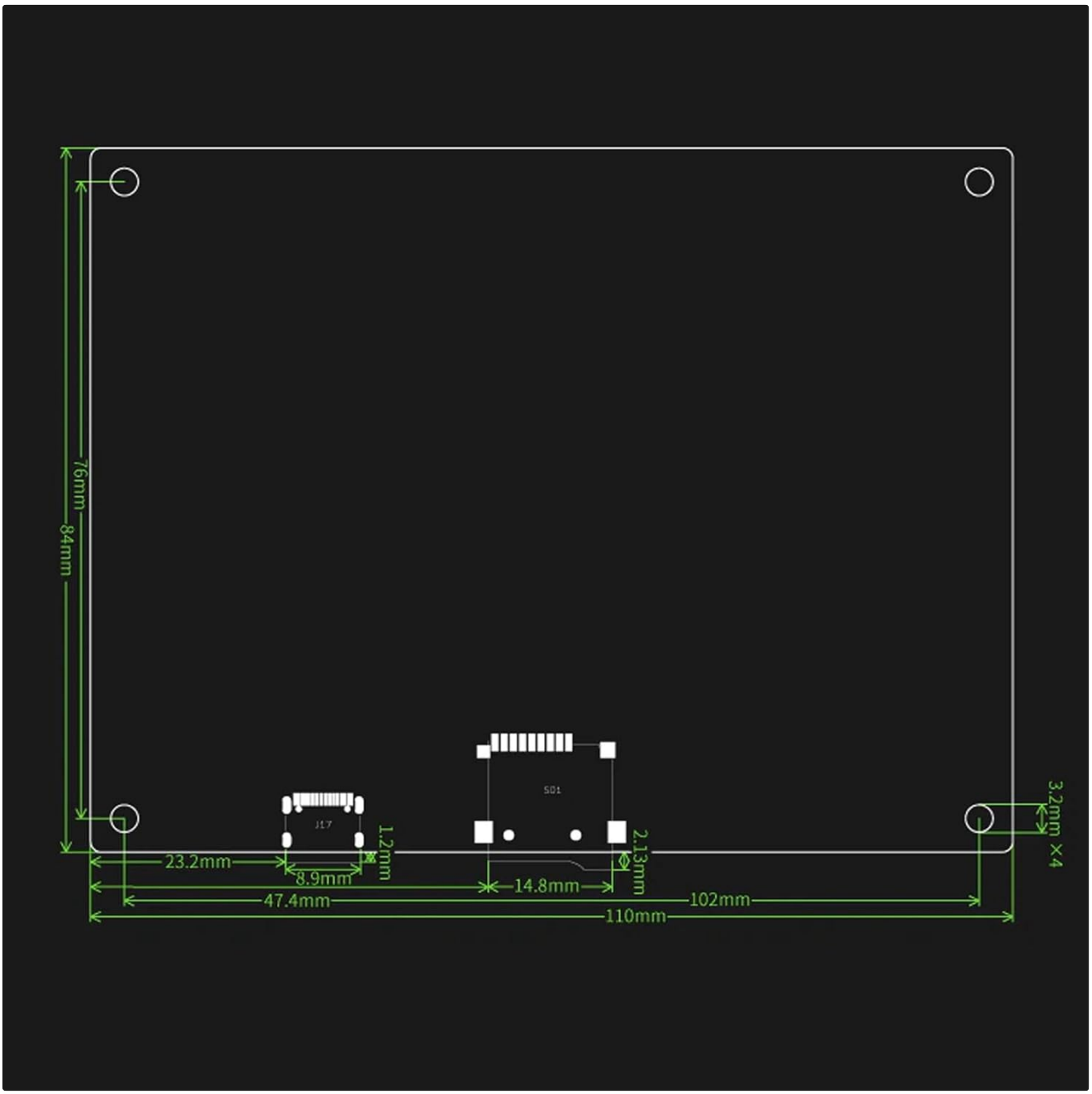

Image 6: Dimensional drawing of the MKS TinyBee V1.0 control board.

7. Warranty and Support

For warranty information, technical support, or further assistance with your Walfront MKS TinyBee V1.0 3D Printer Control Board, please contact Walfront customer service or visit the official Walfront store. Ensure you retain your proof of purchase for any warranty claims.

You can visit the Walfront Store for more information:Walfront Store on Amazon