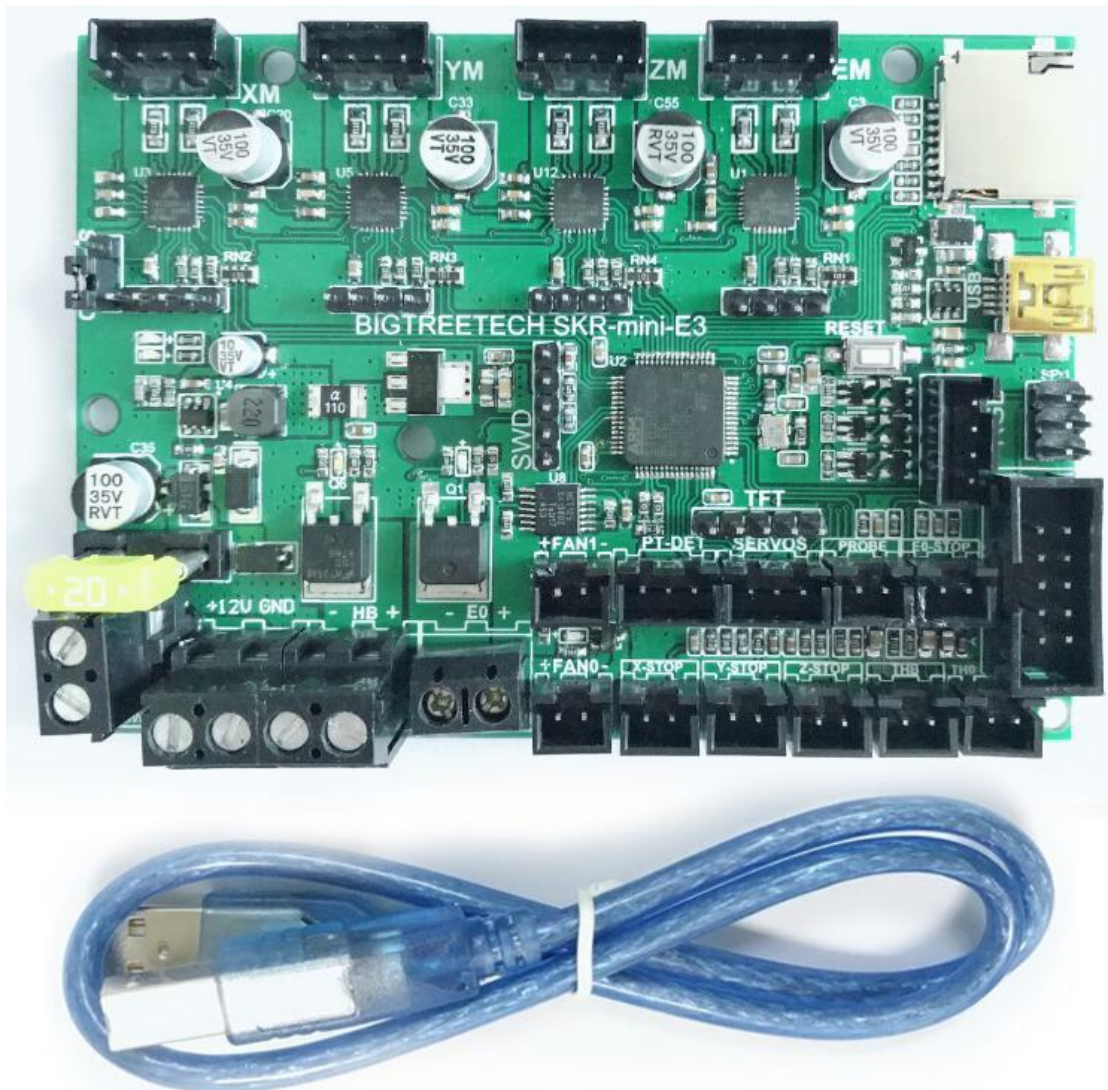


Shenzhen BIGTREE technology co., LTD.
BIG TREE TECH

BIGTREETECH

SKR-mini-E3

User's manual



Product Introduction

BIGTREETECH SKR-mini-E3 motherboard is a ultra-quiet, low-power, high-quality 3D printing machine control board. It is launched by the 3D printing team of Shenzhen BIGTREE technology co., LTD. This board is specially tailored for Ender 3 printer, perfectly replacing the original Ender3 printer motherboard.

• Motherboard Features:

- ARM Cortex-M3 series STM32F103RCT6 chip with 32-bit CPU 72MHz;
- Equipped with highly modular open source firmware Marlin2.0, convenient for users DIY and secondary development, exempt from the worries of the core code;
- Using powerful development tools, Visual Studio Code integrated development environment: support online debugging, more helpful for product development and performance optimization, using C language development, low development threshold;
- PCB board wiring is rigorous and beautiful, and specializing in heat dissipation optimization;
- Using a dedicated power chip to support 12-24V power input;
- Accept 24V input, reduce the hot bed current to 1/4 at the same power, effectively solve the hot bed MOS tube heating problem;
- Support 2.8-inch, 3.5-inch color touch screen and original Ender3 printer LCD12864 screen;
- Upgrade the firmware by SD card, it is easy and convenient to operate;
- Use firmware to set the driving current mode, avoid manual adjustment of current and cause burnout drive. It's convenient, safe and reliable;
- Support functions such as BL touch, RGB lights, printing after power failure, broken material detection, and power off after ending;
- The motherboard integrates the UART mode of TMC2209, making the debugging of motherboard and driver become simple and integrated.
- The motherboard reserves the extension port of part of TMC2209 pins for the convenience of users to use DIAG instead of Endstop and some other functions.

• Motherboard Parameters:

Appearance size: 100*70.25mm

Installation size: This motherboard perfectly replaces the original Ender 3 motherboard, please refer to SKR-mini-E3-SIZE for details

Microprocessor: ARM Cortex-M3 CPU

Power Voltage: 12/24V

Motor Driver: Integration of TMC2209 UART mode

Motor drive interface: XM、YM、ZM、EM

Temperature sensor interface: TH0、THB, 2 channel 100K NTC (thermal resistance)

Display: 2.8" TFT、3.5" TFT、Ender 3 original LCD12864 screen

PC communication interface: mini-USB-type B, easy to plug, communication baud rate of 115200

Support file format: g-code

Recommended software:

Cura, Simplify3D, pronterface, Repetier-host, Makerware

Indicator Light information

After the board is powered on:

The red light D3 is power indicator light. The red light flashing shows the power supply is normal.

Red light D10 is status indicator light. D10 flashes when user update the firmware, and closes when the update is complete.

Green light D6 is hot bed HB status indicator light. The hot bed is always bright when heated and extinguished when not heated;

Green light D4 is the E0 state indicator light of the heating rod. D4 is always on when the heating rod is heated, and it is off when it is not heated;

Green light D5 is the CNC fan FAN0 status indicator light. D5 will be on when the fan is turned on, and off when the fan is off.

SKR-mini-E3 Motherboard and Computer Connect

The motherboard connects with the computer via the USB interface. After the driver is installed, the motherboard can be inserted into the computer to recognize the port for data transmission.

The driver can be obtained from our open-source website:

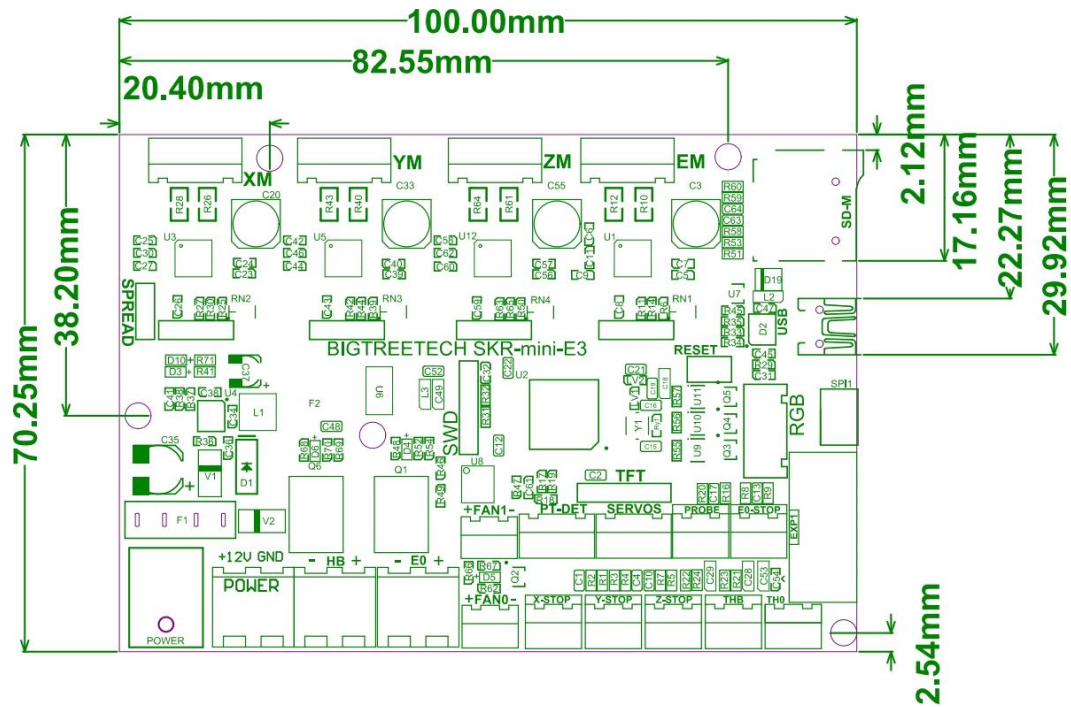
<https://github.com/bigtreotech>

Download the file named mapleDrv for installation.

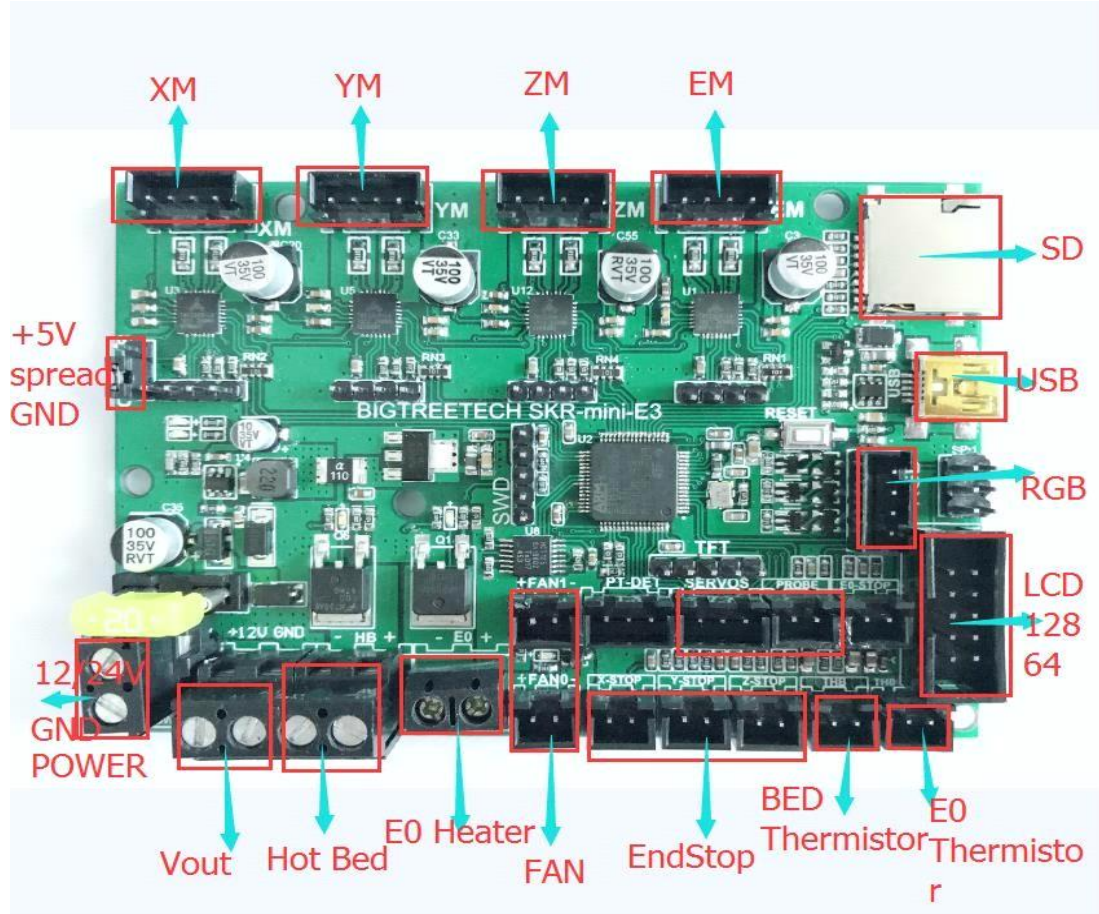


Interface Instruction

1. Motherboard Size Diagram



2. Motherboard Wiring Diagram



Note:

1. Settings about Spread: Low=StealthChop, High=SpreadCycle;
The hardware selection terminal SPREAD is reserved on the motherboard, and users can set it directly in the firmware (there is no need to insert any short-circuit cap on the motherboard).
2. Each driver is reserved with four pin expansion ports, respectively DIAG, INDEK, CLK, VREF from left to right. Users can add DIY functions according to their own preferences, such as DIAG as ENDSTOP function and so on.

The firmware description of motherboard

- The test firmware (For Ender 3) will be installed in the factory motherboard. The firmware can be used directly or can be changed according to your own needs.
- The Firmware Acquisition Method of SKR Motherboard
Obtain by Ask customer service or technical personnel;
Download at our Company Open source website:
<https://github.com/bigtreotech>

- Motherboard firmware update method
Choose the file suitable for your model in the downloaded firmware package to copy to SD Card Root directory

Note: File name cannot be changed, firmware.bin must be lowercase!

Insert SD card into the main board SD card slot, re-energize or press the reset

key, wait for about 10S. After that, the update can be completed.

For DIY motherboard firmware, please refer to skr-mini-e3-pin data;

Notes:

- Firmware file names in SD Card cannot be changed. (including both upper and lower case letters);
 - The wiring process and the plug-in drive process must be carried out under the premise of

power off. The power on can be started after checking the correct connection of the line and the correct insertion of the drive, so as to prevent the wrong connection of the mainboard and drive from being burnt down and causing unnecessary losses;

- Skr-mini-E3 is a motherboard designed specifically for the Ender 3 printer. If the user wants to use another machine, please refer to the corresponding electrical parameters of Ender3 (such as hot bed power, heating rod power, etc.). The electrical parameters of other machines should never exceed the electrical parameters of Ender 3 machines. Otherwise our company will not compensate for any losses caused.

- The E3 motherboard can support the LCD12864 screen with the interface CR10_STOCKDISPLAY.

If you encounter other problems while using, please contact us, we will answer you scrupulous; if you have any good comments or suggestions for our products, pls feel free to inform us, we will carefully consider your comments or suggestions, thank you for choosing BIGTREETECH products, thank you!