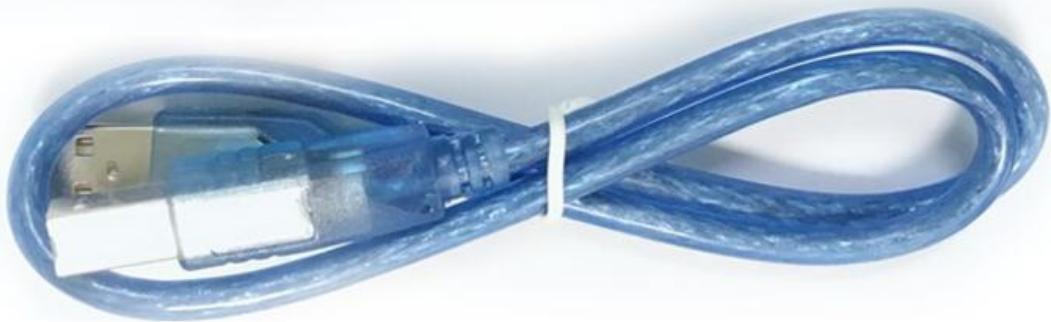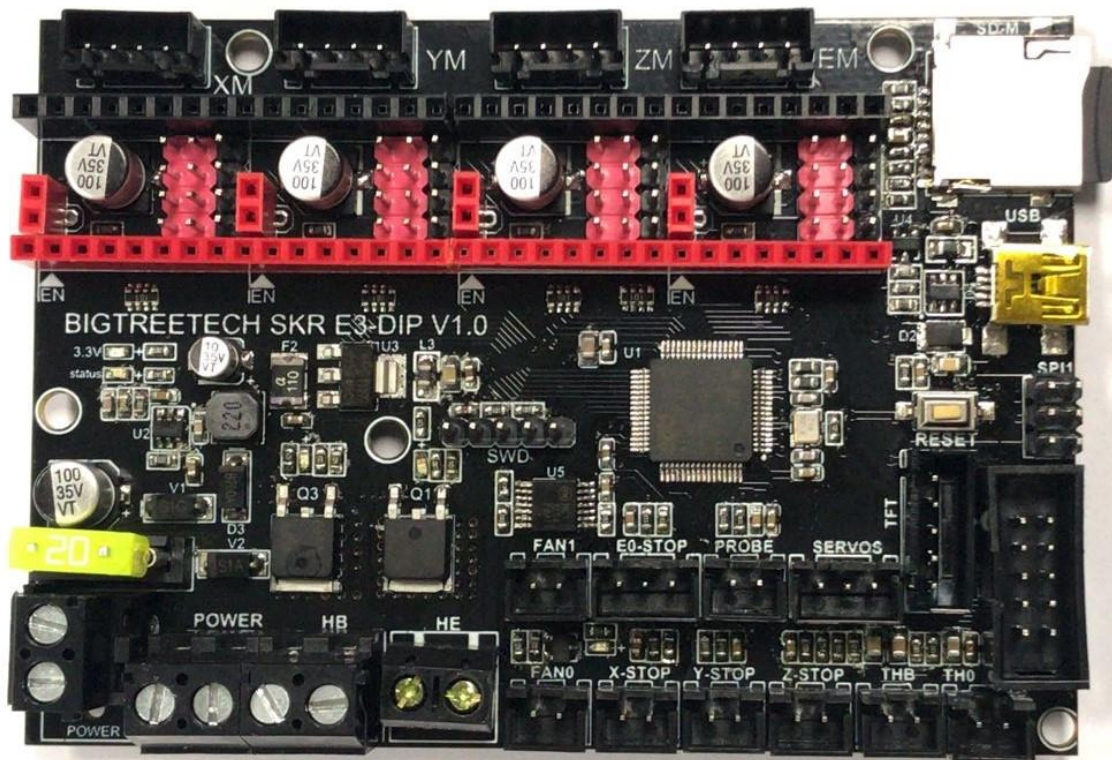# BIGTREETECH

SKR E3 DIP V1.0

User's Manual

I. Product Introduction

BIGTREETECH SKR-E3-DIP-V1.0 motherboard 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.

1.Motherboard Features：

1）ARM Cortex-M3 series STM32F103RCT6 chip with 32-bit CPU 72MHz;

2）Equipped with highly modular open source firmware Marlin2.0 ,convenient for users DIY and secondary development, exempt from the worries of the core code;

3）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;

4）PCB board wiring is rigorous and beautiful, and specializing in heat dissipation optimization;

5）Using a dedicated power chip to support 12-24V power input;

6）Accept 24V input, reduce the hot bed current to 1/4 at the same power,effectively solve the hot bed MOS tube heating problem;

7）Support 2.8-inch, 3.5-inch color touch screen and original Ender3 printer LCD12864 screen;

8）Upgrade the firmware by SD card, it is easy and convenient to operate;

9）Use firmware to set the driving current mode, avoid manual adjustment of current and cause burnout drive.It's convenient, safe and reliable;

10）Support functions such as BL touch, RGB lights, printing after power failure, broken material detection, and power off after ending;

11）Integration of TMC2130 and TMC5160 SPI mode. The motherboard and driver debugging becomes simple;

12）Integration of TMC2208 UART mode;

2.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 TMC2130&TMC5160 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

II. Indicator Light Information

After the board is powered on：

The 3.3V light is power indicator light. This light flashing shows the power supply is normal.

The STATUS blue light is status indicator light. This light 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.

III. 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.

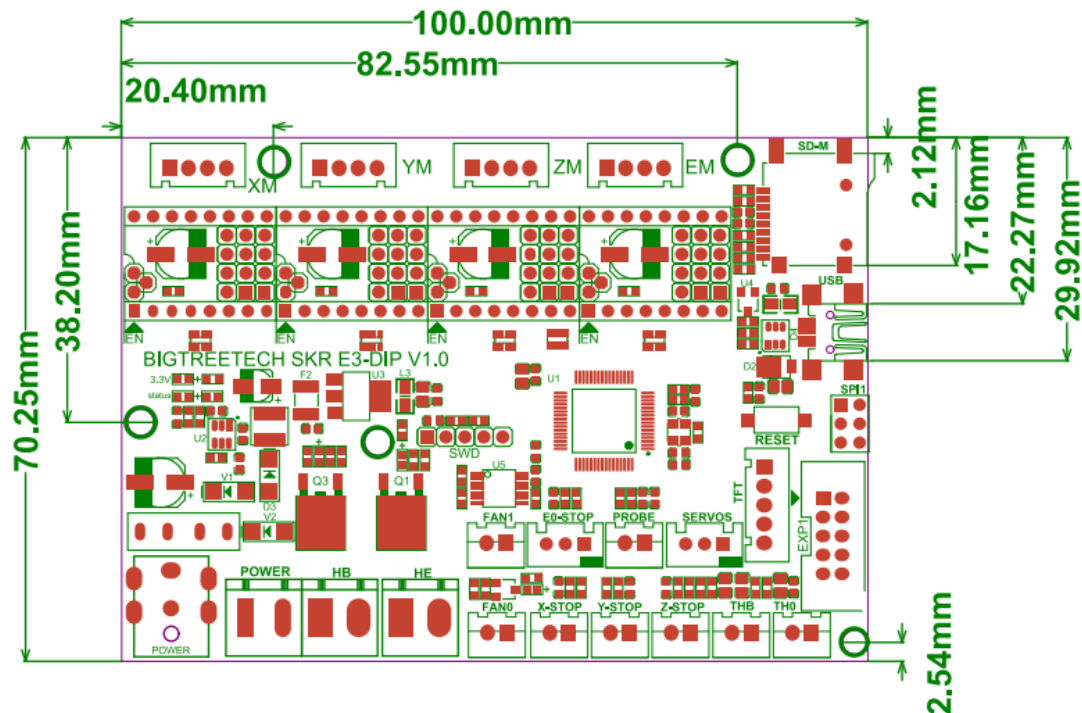The driver can be obtained from our open-source website:

https://github.com/bigtreetech

Download the file named mapleDrv for installation.

IV. Interface Instruction
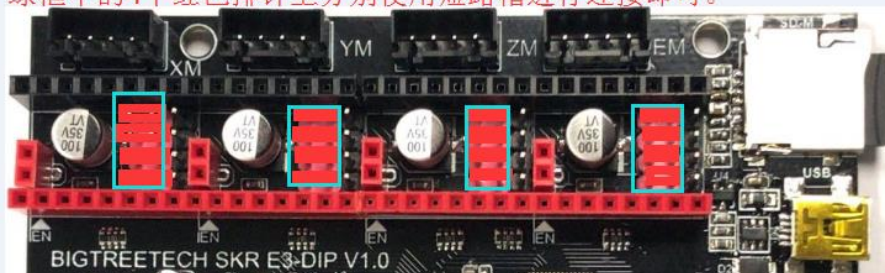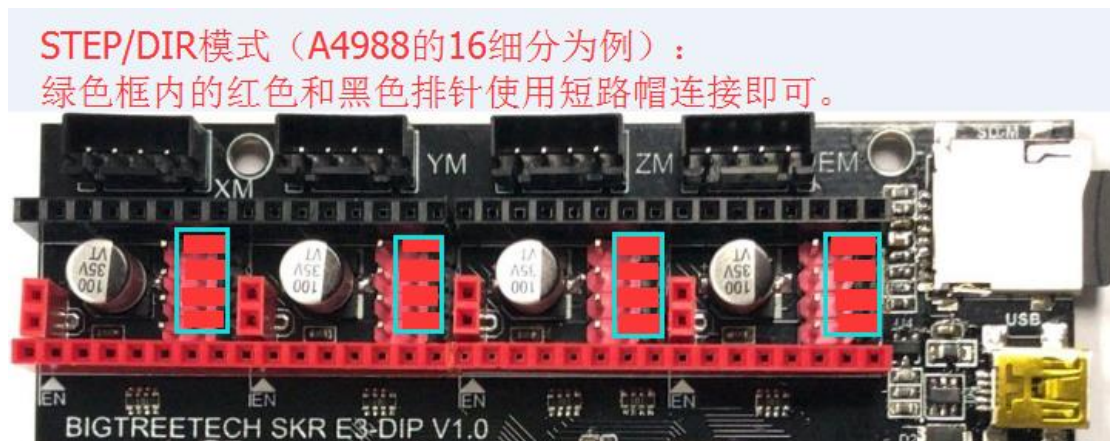
1. Motherboard Size Diagram

2. Motherboard Wiring Diagram
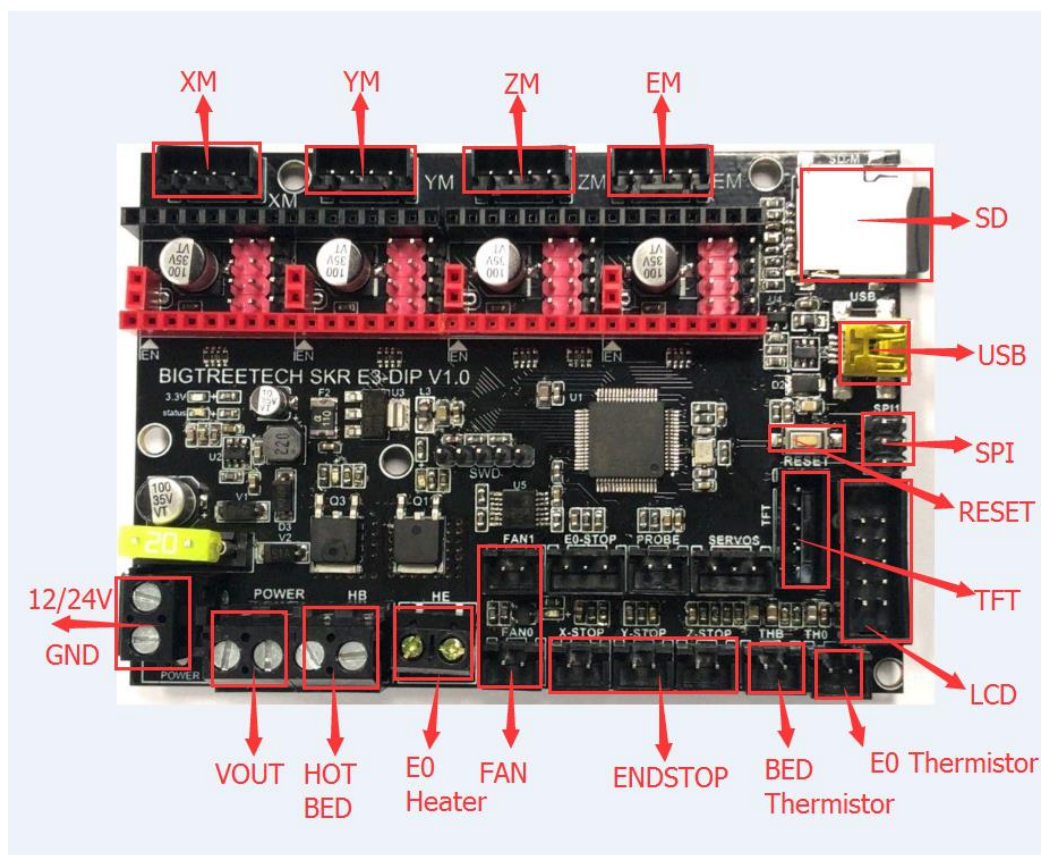
3.Drive mode setting

TMC2130&TMC5160的SPI模式：
绿框中的4个红色排针上分别使用短路帽进行连接即可。

V. The Motherboard Firmware Description

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.

1. 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/bigtreetech

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;

VI. Notes

1.Firmware file names in SD Card cannot be changed.(including both upper and lower case letters)；

2.2.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；

3.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.

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

5.Drive mode and microsteps must be consistent with the preset firmware, otherwise the motor will not work.

If you meet 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!