BIGTREETECH

SKR MINI E3 V2.0

Operation Manual of the Motherboard
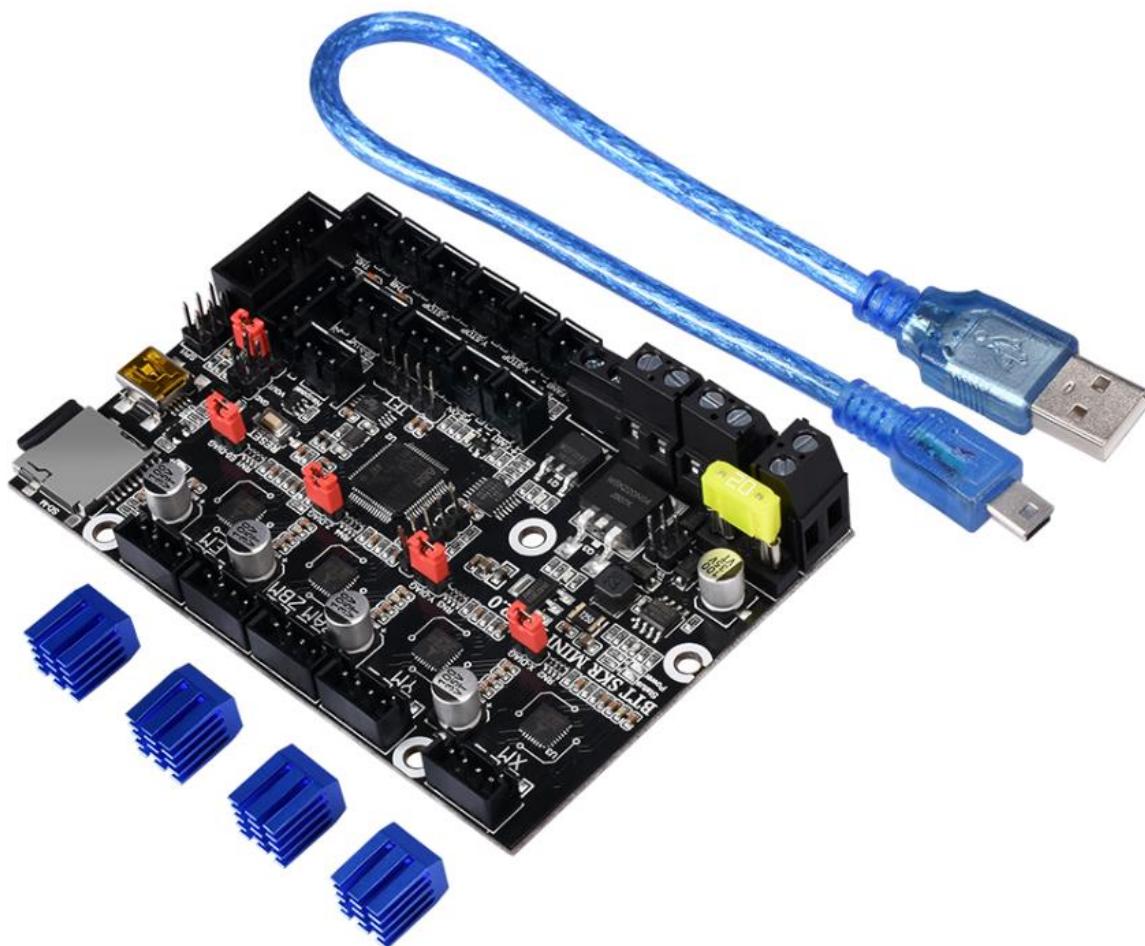
Ⅰ.Introduction

BTT SKR MINI E3 V2.0 is a customized motherboard for Ender3 printer launched by the 3D printing team of Shenzhen BIGTREE technology co., LTD., which can perfectly replace the motherboard of the original Ender3 printer.

1. Motherboard features: (mainly introduces upgrades based on V1.2)

1) Use MP1584EN power chip, support 12-24V power input, the maximum output current can reach 2.5A;

2) The hot bed MOS tube uses WSK220N04, low on-resistance, larger heat dissipation area, and reduce heat generation;

3) Onboard Sensorless homing function, which can be used by plugging in the jump cap;

4) Optimize the PCB board and frame to avoid the phenomenon of screw hole gap and screws hitting components;

5) Support BLtouch, filament detection, BTT UPS 24V V1.0, BTT Relay V1.2, etc .;

6) Onboard EEPROM: AT24C32;

7) Add parallel double Z-axis interface;

8) Increase the board layer: 4 layer board;

9) Increase the heat dissipation area of the back driver and strengthen the heat dissipation capacity;

10) Two CNC fan interfaces;

11) Increase the distance between the driving chip and the components to avoid the trouble caused by the heat sink;

12) Add protection device to the thermistor interface;

13) 5V power supply with BLtouch, TFT and RGB interfaces is optional;

14) The driver shares a physical UART port, which saves IO and enhances stability.

2. Motherboard parameters:

Appearance size: 100.75 * 70.25mm

Installation size: check BTT SKR MINI E3 V2.0-SIZE.pdf for details

Layer: 4 layers

MCU: ARM Cortex-M3 STM32F103RCT6

Power input: DC 12 / 24V

Logic voltage: 3.3V

Motor driver: UART mode of onboard TMC2209;

Motor drive interface: XM, YM, ZAM, ZBM, EM

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

Display: 2.4 inch TFT, 3.5 inch TFT, Ender3 original LCD12864 screen, etc.

PC communication interface: mini-USB-B type, easy to plug and unplug,

communication baud rate 115200

Support file format: G-code

Recommended software: Cura, Simplify3D, pronterface, Repetier-host,

Makerware

Ⅱ.Description of motherboard indicators

After power on the main board:

3.3v red light is power indicator: the red light is on, indicating normal

power supply;

Status red light is the Status indicator: when updating the firmware, it

will flicker.

D8 green light is the HB status indicator for the hot bed: it is always on

when heated, and it goes out when not heated.

D6 green light is the indicator light of E0 status of the heating tube: it is

always on when heating, and it will go out when not heating.

D10 green light for CNC fan FAN0 status indicator: it lights up when

turned on, and goes out when turned off.

D7 green light for CNC fan FAN1 status indicator: it lights up when

turned on, and goes out when turned off.

Ⅲ. Communication between `motherboard` and `PC`

The motherboard communicates with the PC (Windows system) through the [USB] interface. Before communication, the driver needs to be installed to be used normally. Driver acquisition method:

Website: https://github.com/bigtreetech Download the file named: mapleDrv to install it.

IV. Interface Instruction

1. Motherboard Size Diagram

2. Motherboard Wiring Diagram
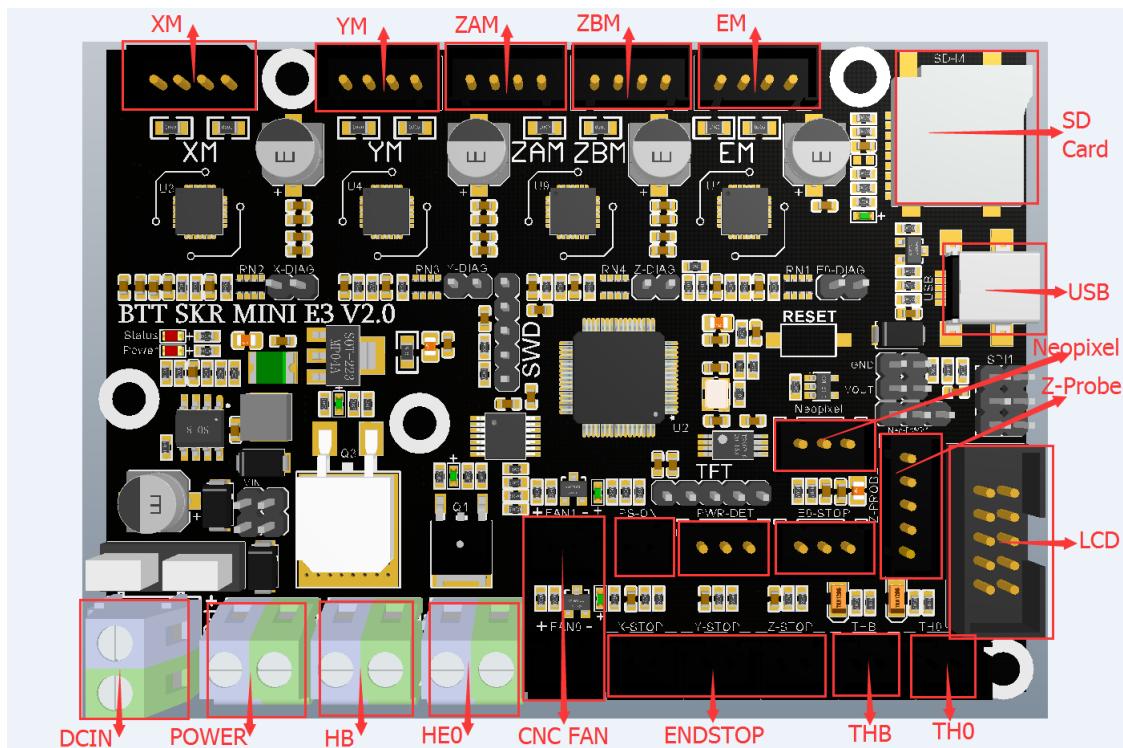
## 3. Sensorless Homing Function Selection：
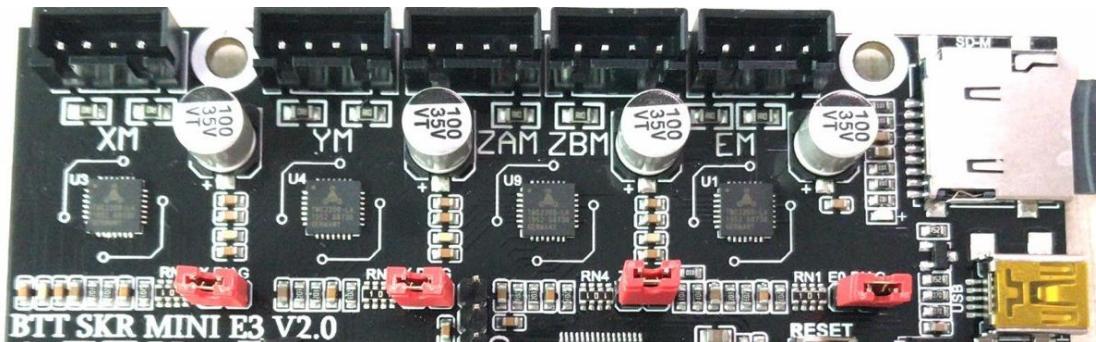
As shown in the figure, the Sensorless homing function can be used to connect the corresponding axis with the jumper cap.

Note: if you select this feature, you cannot use external ENDSTOP!!

4. 5V power selection for BLtouch, TFT and RGB interfaces:

1) onboard +5V power supply:
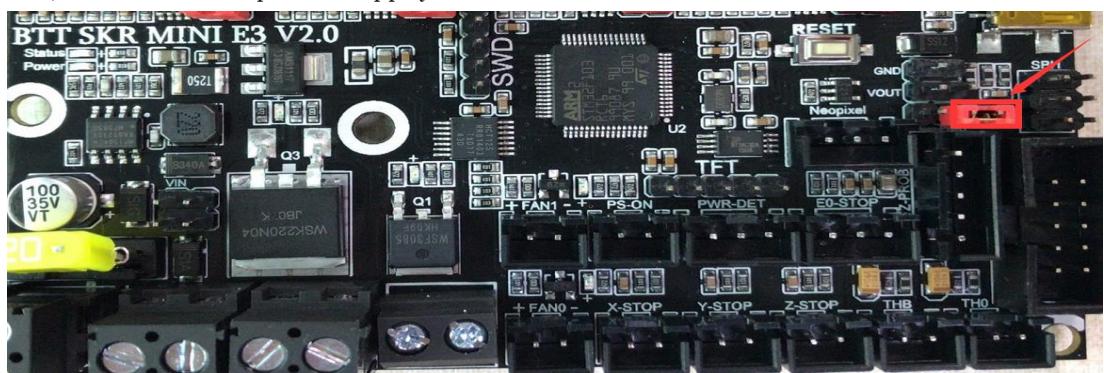
2）Use BIGTREETECH DCDC5V V1.0 module+5V power supply：
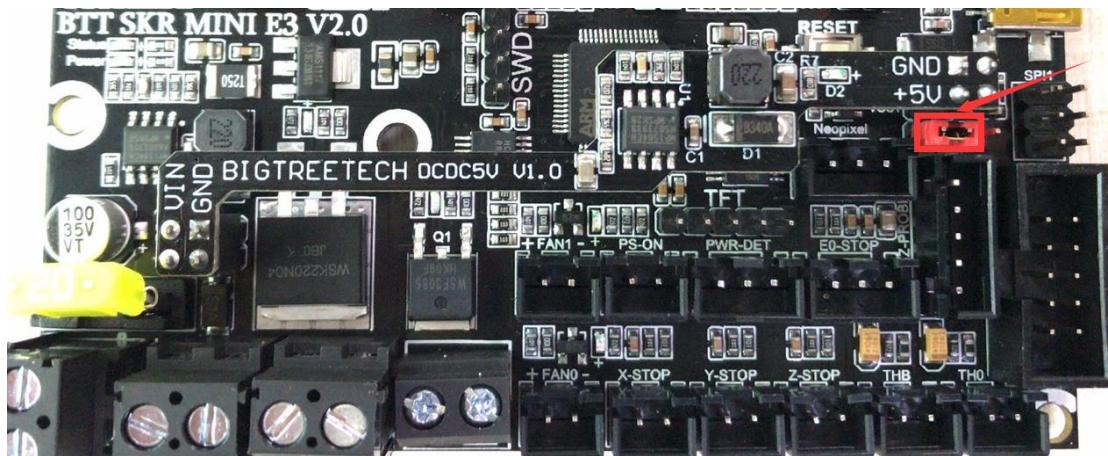
5.Connection with BIGTREETECH Relay V1.2：
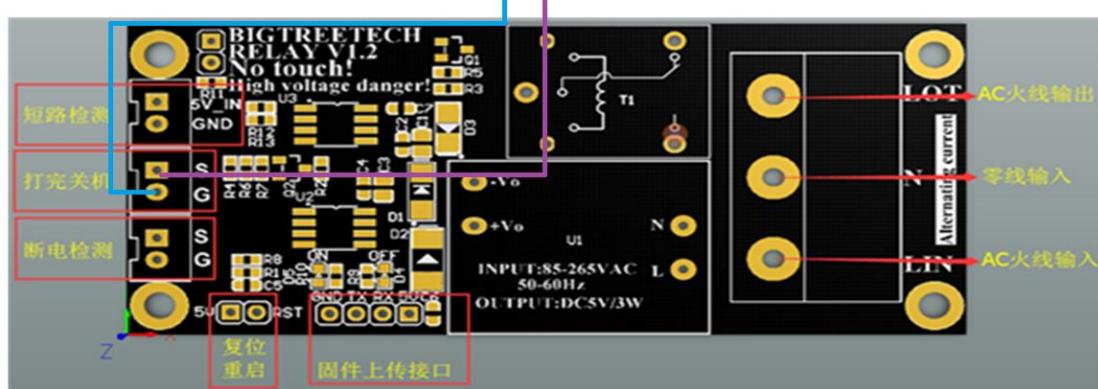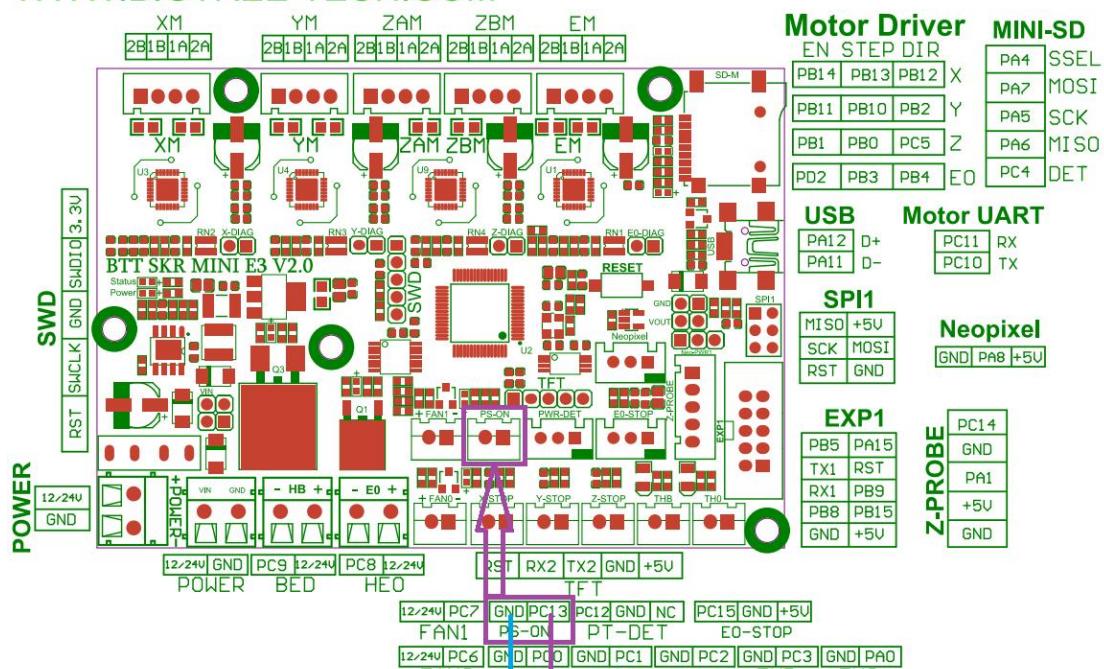
6.Connection with BTT UPS 24V V1.0：
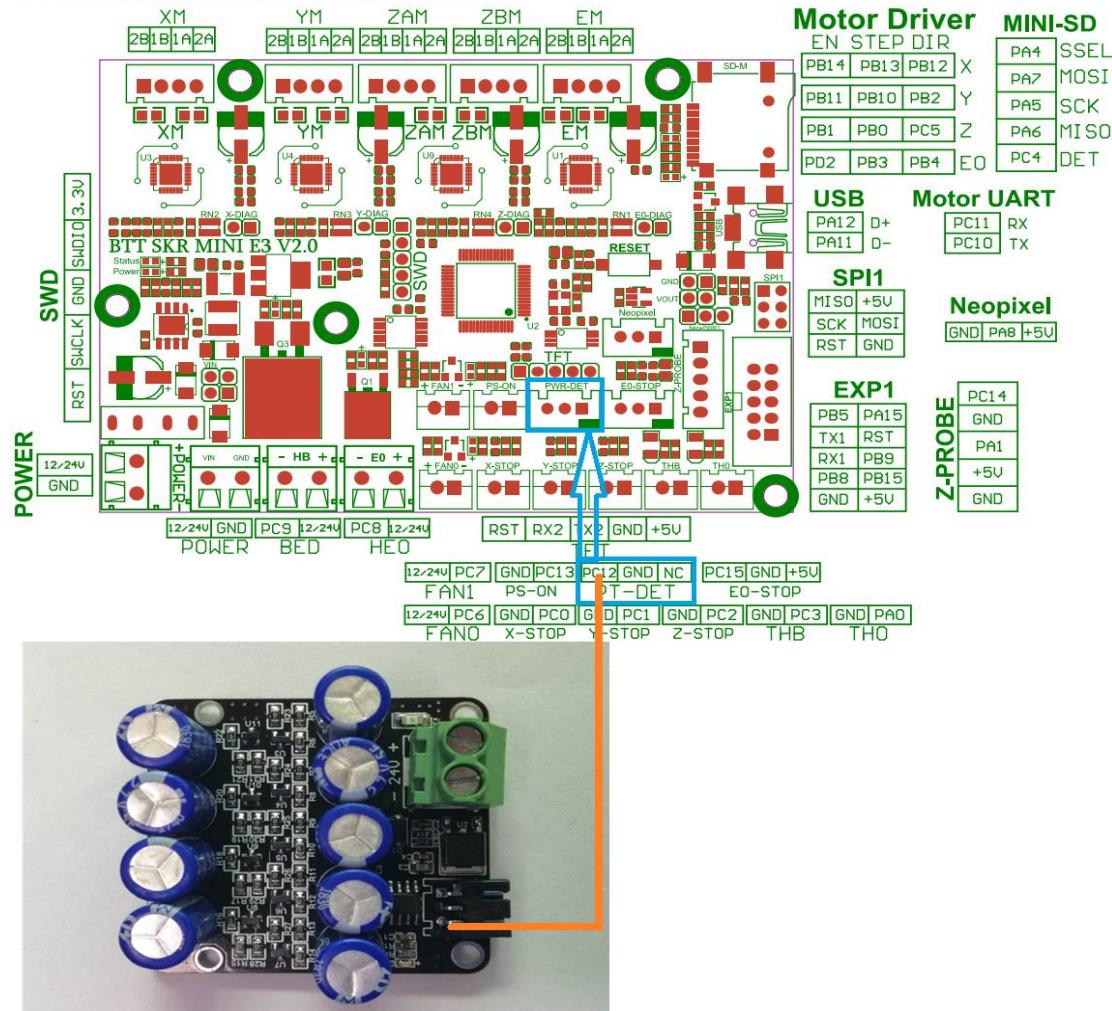
7.Connection with Neopixel lights：
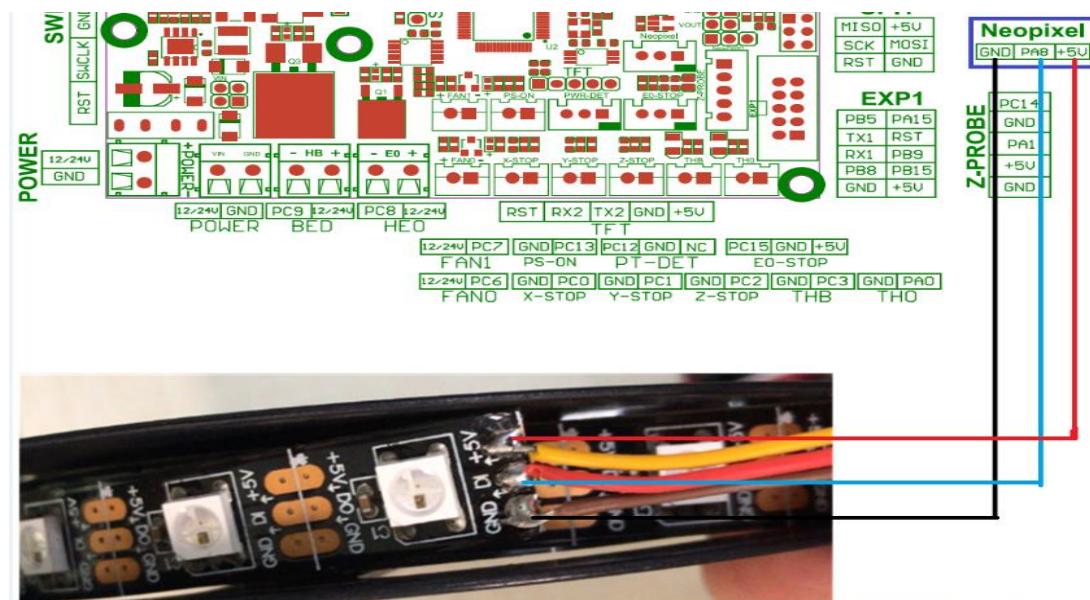
8.Connection with BLtouch:
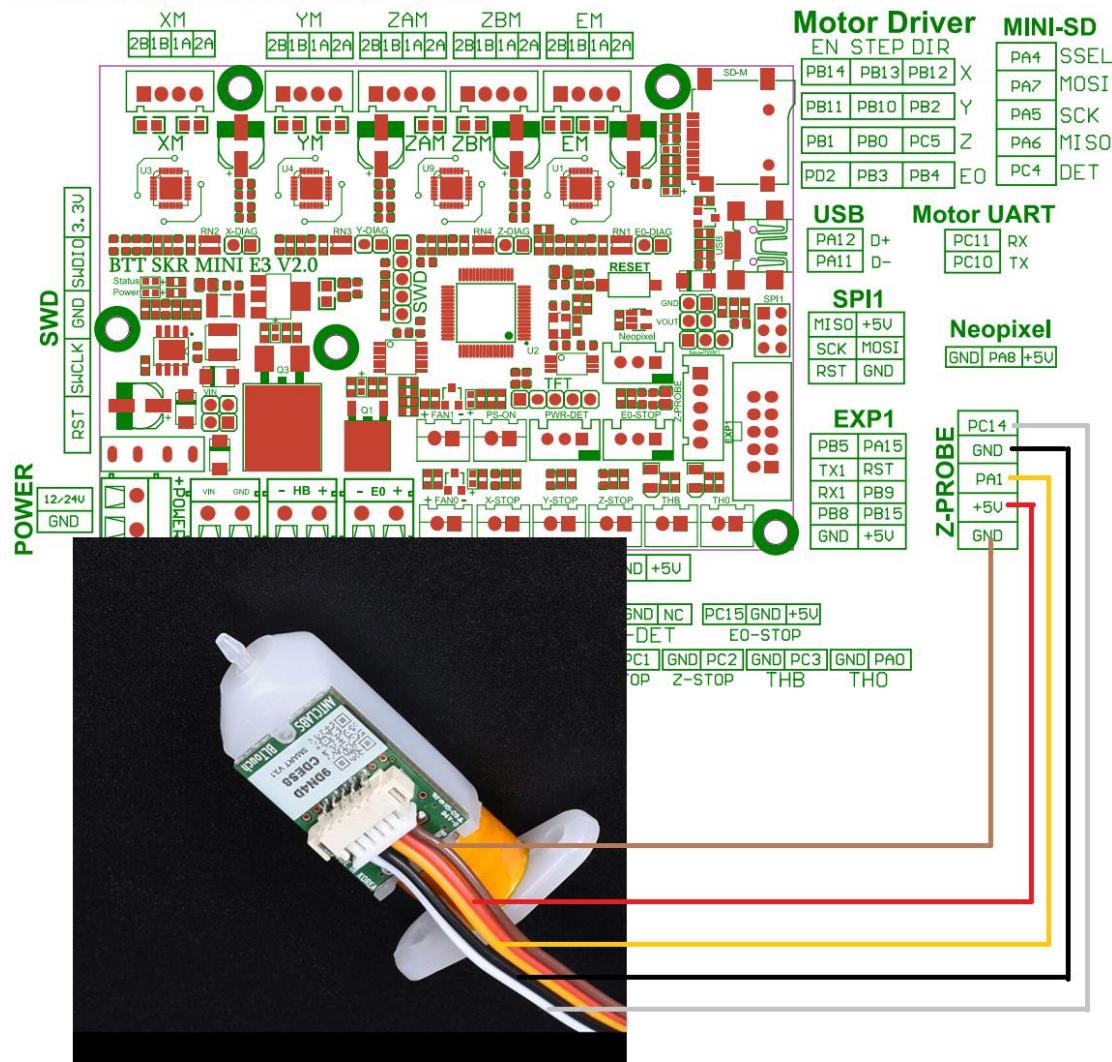
V. The firmware description of motherboard

The factory motherboard is installed equipped with firmware for testing (model Ender3), which can be used directly or changed according to your own needs.

1. The Firmware Acquisition Method of Motherboard:

Obtain by Ask customer service or technical personnel;

Download at our Company Open source website: https://github.com/bigtreetech

2. 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.
3.For DIY motherboard firmware, please refer to BTT SKR MINI E3
V2.0-PIN.pdf data.

VI.Notes

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

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

If you encounter other problems, please contact us. We will definitely answer your questions patiently. If you have any good suggestions on our products, please give us feedback. We will consider them seriously. Thank you for choosing BIGTREETECH products!