# BIGTREETECH

# SKR V1.1

## 主板使用说明书

# 一、SKR 主板简介

BIGTREETECH SKR V1.1 主板是深圳必趣科技有限公司 3D 打印团队针对市面上主板存在的一些问题，推出的一款性价比很高的 3D 打印机主控板，特别适合中小型打印机使用。

BIGTREETECH SKR V1.1 motherboard is produce by ShenZhen BigTree Technology CO.,LTD. .The team launched a cost-effective 3D for some problems in the motherboards on the market.

The SKR main board , especially suitable for small and medium-sized printers.

<span style="color:red">Note : We have a small SD card for each motherboard.File names cannot be changed in the SD card.</span>

## 1. SKR 主板特点：

① 采用 32 位主频 100M 的 ARM 级 Cortex-M3 系列 LPC1768 主控芯片，性能大幅提升；

② 搭载高度模块化开源固件 Smoothieware，方便用户 DIY 及二次开发，免除无法掌握核心代码的后顾之忧；

③ 使用强大的开发工具，Keil MDK 集成开发环境：支持在线调试，对产品开发和性能优化更有帮助，采用 C 语言开发，开发门槛低；

④ PCB 板布线严谨美观，并专门做了散热优化处理；

⑤ 采用专用电源芯片，支持 12-24V 电源输入；

⑥ 可接受 24V 输入，同样功率下可以把热床电流减小到 1/4，有效解决热床 MOS 管发热问题；

⑦ 支持 2.8 寸、3.5 寸彩色触摸屏，支持 LCD12864 屏；

⑧ 系统支持中文简体、英文等语言，可自行切换；

⑨ 通过 SD 卡升级配置固件，操作简单方便；

⑩ 采用配置文件来设置驱动电流的方式，避免手动调节电流导致烧坏驱动，方便，安全，可靠；

⑪ 支持断电续打、断料检测、打完关机等功能；

⑫ 采用高性能 MOSFET 管，散热效果更好。

Parameter Features:

1) ARM-class Cortex-M3 series LPC1768 master chip with 32-bit main frequency 100M, Can be greatly improved;

2) Equipped with highly modular open source firmware Smoothieware, convenient for users DIY and secondary development, do not worry about the inability to master the core code of worries;

3) Using powerful development tools, Keil MDK 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) Acceptable 24V input, the hot bed current can be reduced to 1/4 under the same power, effectively solving the heating problem of the hot bed MOS tube;

7) Support Disdplay : 2.8-inch, 3.5-inch color touch screen, LCD12864 screen;

8) The system supports Chinese simplified Chinese, English and other languages, which can be switched by itself;

9) Upgrade the firmware by SD card, which is easy and convenient to operate;

10) Use the configuration file to set the driving current mode, avoid manual adjustment of the current to cause the burned drive, convenient, safe and reliable;

11) High-performance MOSFET tube for better heat dissipation.

12) Support functions: Non-trace resumption after power off, run out filament ,and auto shut down.

## 2. SKR 主板参数：

外观尺寸：110*85mm

安装尺寸：97mm*67mm

微处理器：ARM Cortex-M3 CPU

输入电压：DC12V-DC24V　5A-15A

电机驱动器：支持 TMC2208、TMC2130、LV8729、DRV8825、A4988 等，可单独外接电机驱动

电机驱动接口：X、Y、Z、E0、E1，五路（各路都有一个可再扩展接口），最高可达 256 细分

温度传感器接口：TH0、TH1、TB，3 路 100K NTC（热电阻）

显示屏：2.8 寸 TFT、3.5 寸 TFT、LCD12864

PC 通信接口：方形 USB，方便插拔，通信波特率 115200

支持文件格式：G-code

支持机器结构：XYZ、delta、kossel、Ultimaker、corexy

推荐软件：Cura、Simplify3D、pronterface、Repetier-host、Makerware

# 深圳市必趣科技有限公司
## BIG TREE TECH

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Appearance size: 110*85mm Installation size: 97mm*67mm
Microprocessor: ARM Cortex-M3 CPU
Input voltage: DC12V-DC24V  5A-15A
Motor Driver: Supports TMC2208, TMC2130, LV8729, DRV8825, A4988
Etc., can be externally connected to the motor drive
Motor drive interface: X, Y, Z, E0, E1, five channels (each channel has a re-expandable interface), up to 256 subdivisions
Temperature sensor interface: TH0, TH1, TB, 3 channels 100K NTC (thermal resistance)
Display: 2.8 inch TFT, 3.5 inch TFT, LCD12864
PC communication interface: square USB, easy to plug and unplug, communication baud rate 115200
Support file format: G-code
Support machine structure: XYZ, delta, kossel, Ultimaker, corexy
Recommended software: Cura, Simplify3D, pronterface, Repetier-host, Makerware

# 二、SKR 主板通电

　　SKR 主板上电之后，左下角的 D4 红灯会亮起，表示供电正常；板子中部的 5V SEL 是电源选择端；

　　1) 当使用 USB 给主板供电时，需用短路帽连接+5V 和 USB 两脚；

　　2) 当使用 12V-24V 供电时，需用短路帽连接+5V 和 INT 引脚；

　　注：可同时接【12V-24V 电源】、【USB】，打印过程必须用短路帽连接+5V 和 INT 两脚。

　　After the SKR motherboard is powered on, the red light D4 in the lower left corner will light up, indicating that the power supply is normal; The middle of the board 5V SEL is the power supply selection end;

　　1) when using USB to power the motherboard, short circuit cap should be used to connect +5V and USB feet;

　　2) when 12v-24v power supply is used, short circuit cap shall be used to connect +5V and INT pins;

　　Note: it can be connected to both [12v-24v power] and [USB] at the same time. Short circuit cap must be used to connect +5V and INT in the printing process.

# 三、SKR 主板与 PC 通信

　　SKR 主板通过【USB】接口与 PC 通信，需要装驱动才能正常使用。

1.smoothieware-usb-driver-v1.1 驱动安装

　　驱动可从开源网 http://smoothieware.org/windows-drivers 获取；

2.安装完驱动，用 USB 线连接 PC 和 SKR 主板

　　打开电脑"设备管理器"，可查看到"smoothieboard USB Serial"异步通信口所属的 COM 号。



SKR motherboard through the [USB] interface and PC communication, need to install the driver to use normally.

## 1. Smoothieware-usb-driver-v1.1 driver installation

Drivers are available from the open source web at http://smoothieware.org/windows-drivers
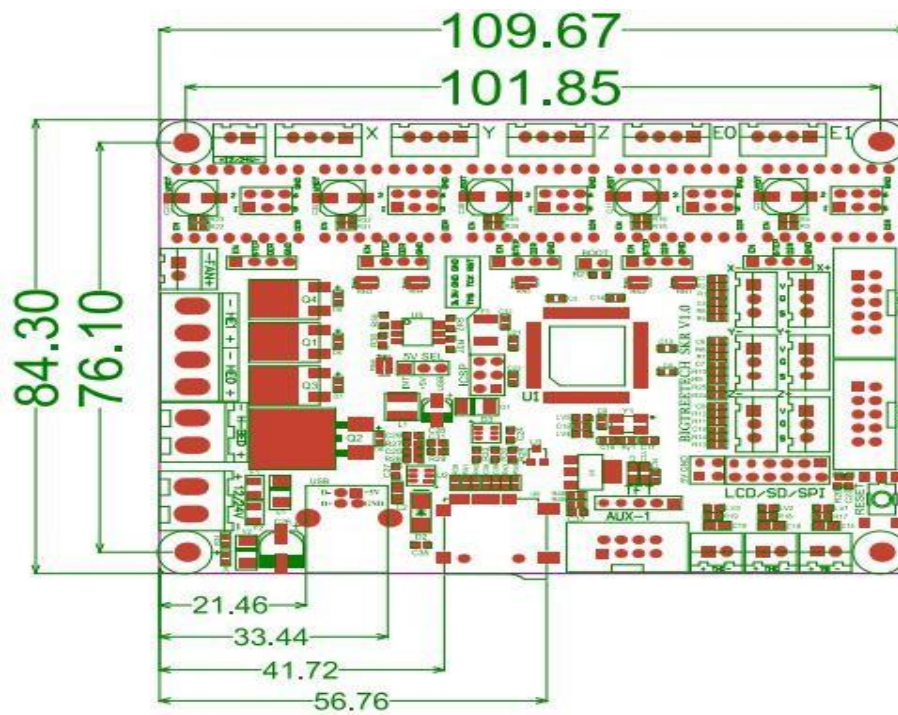
2. After installing the driver, connect the PC and SKR motherboard with a USB cable.

Open the computer "device manager", and you can see the COM number of "smoothieboard USB Serial" asynchronous communication port.
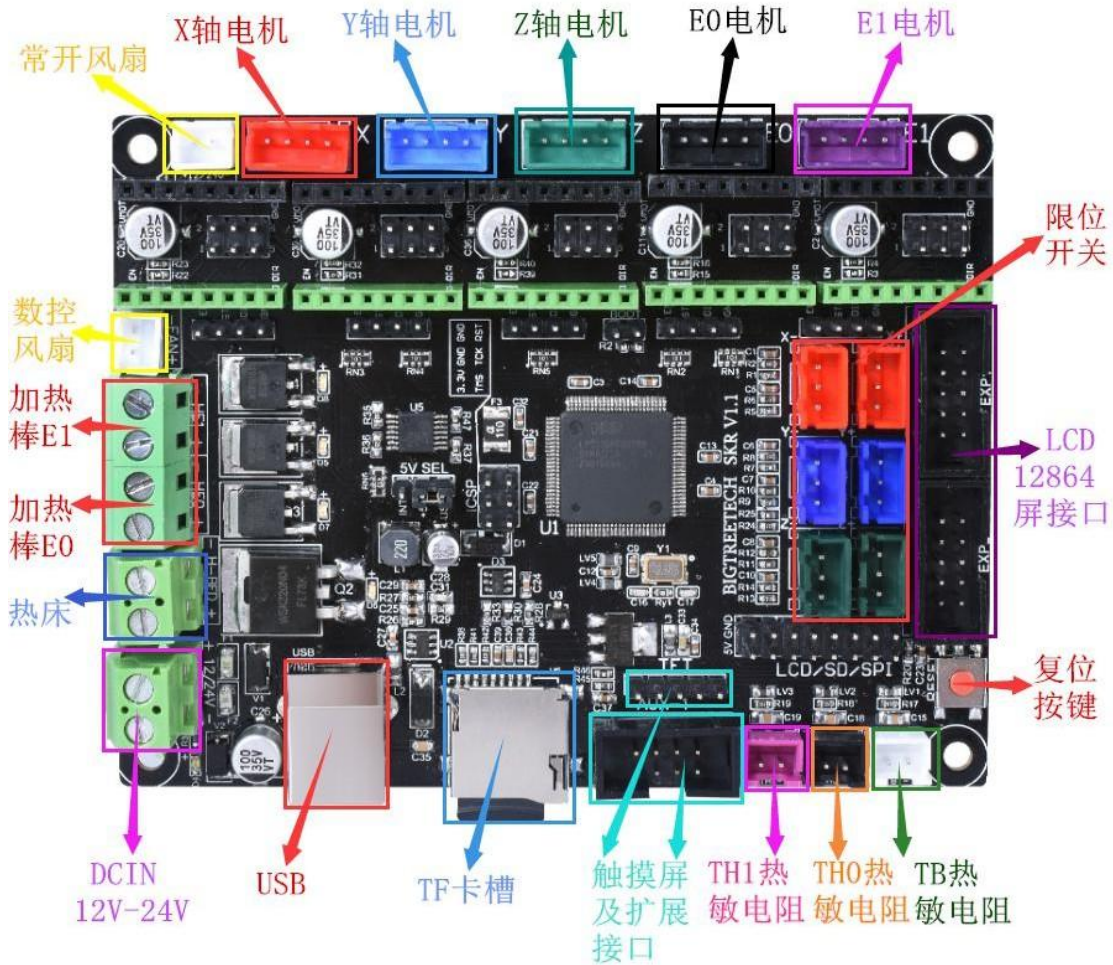
# 四、SKR 主板接口说明

1. SKR 主板尺寸图

2. SKR 主板接线图



# 五、SKR 主板固件说明

**出厂的主板里会装有测试使用的固件（I3 机型），可以直接使用，也可根据已需自行更改。**

1. SKR 主板固件获取方式

问客服或者技术人员获取；

登录开原网址进行下载：https://github.com/Smoothieware/Smoothieware

2. SKR 主板固件更新方法

⑴ 在下载好的固件包中选择适合自己机型的文件拷贝到SD 卡根目录，包括：

①固件 firmware.bin（根据自己机型进行选择）

②配置文件 config.txt（可根据自己需求自行更改配置）配置文件中的详细功能选项可参考开原网址：http://smoothieware.org/configuration-options

**注：不可更改文件名，firmware.bin 必须为小写！**

⑵ 将 SD 卡插入主板 SD 卡槽中，重新上电或者按一下复位键，等约 10S 之后即可更新完成；

Our motherboard will be equipped with firmware (I3 model) for testing, which can be used directly or can be changed according to your own needs

1.The SKR motherboard firmware access method：

Log on to the open source site to download：

https://github.com/Smoothieware/Smoothieware

2.2. Firmware update method of SKR motherboard

1) select the file suitable for your model from the downloaded firmware package and copy it to the SD root directory, including:

(1) firmware. bin (all that can be decided based on your own machine)

(2)Configuration file config.txt (you can change the configuration according to your own needs)

The details of the configuration file can be referenced in the open source web address:

http://smoothieware.org/configuration-options

Note: file names cannot be changed, firmware. bin must be lowercase!

We do not recommend using the tmc2130 spi on this board. If you really need to use spi on this board, you need to change the firmware by yourself, and we do not have relevant firmware to provide. In order to make it more comfortable for you to use, please directly use the STP/DIR mode of tmc2130

# 六、注意事项：

1. 主板 5V SEL 必须连接 INT 和 +5V 两个引脚，方可进行打印（即必须有 12V-24V 电源给主板供电才能进行打印）；

2. 主板所接热床功率必须小于等于 110W（即热床电阻值大于 1.3Ω），要是用大功率热床时，必须外接热床功率扩展板；

3. SD 卡中的固件文件名字不可更改（包括大小写）；

4. 接线过程和插驱动过程必须是在断电前提下进行，在检查线路正确连接及驱动正确插入后方可上电，防止接错线导致主板和驱动被烧毁，造成不必要的损失；

5. 若要更换配置文件，请将出厂的配置文件备份，以记录 各部分芯片引脚标号，然后对新的配置文件进行更改！

Attention:

1. 5V SEL of the motherboard must connect INT and +5V pins before printing (that is, 12v-24v power supply must be provided to the motherboard before printing);

2. Hot bed board receive power must be less than or equal to 110 w (that is, the hot bed resistance is greater than 1.3 Ω), if with high power hot bed, have to external thermal power expanded bed plate;

3. The wiring process and plug-in driving process must be carried out under the premise of power failure. The power can be turned on after checking the correct

connection of the line and the correct insertion of the drive, so as to prevent the wrong connection of the line from burning the motherboard and drive and causing unnecessary losses;

4.If you want to change the configuration file, backup the factory configuration file to record the pin number of each part of the chip, and then make changes to the new configuration file.

FAQ

Q：电脑无法识别 SKR 主板？

A：检查是否安装 smoothieware-usb-driver-v1.1 驱动，可上开原网址自

行下载安装，安装好后，用 USB 线连接电脑和 SKR 主板即可。

Q：更改配置文件后，插入主板，固件未能更新成功？

A:查看 SD 卡中的 firmware.bin 文件的格式是否正确，且是否为

小写、文件名是否正确。

Q：自己更换配置文件后，LCD12864 屏无法显示？

A:在配置文件中找到屏幕的配置信息，对照下面的进行更改

```
panel.enable                     true              # 使能显示屏设置

panel.lcd                        reprap_discount_glcd    #显示屏类型
panel.spi_channel                0                 # SPI channel to use  ; GLCD EXP1 Pins 3,5 (MOSI, SCLK)
panel.spi_cs_pin                 0.16              # SPI chip select     ; GLCD EXP1 Pin 4
panel.encoder_a_pin              3.25!^            # Encoder pin         ; GLCD EXP2 Pin 3
panel.encoder_b_pin              3.26!^            # Encoder pin         ; GLCD EXP2 Pin 5
panel.click_button_pin           2.11!^            # Click button        ; GLCD EXP1 Pin 2
panel.buzz_pin                   1.30              # Pin for buzzer      ; GLCD EXP1 Pin 1
panel.back_button_pin            0.28!^            # Back button         ; GLCD EXP2 Pin 8

panel.external_sd                true                  # set to true if there is an extrernal sdcard on the panel
panel.external_sd.spi_channel    0                     # set spi channel the sdcard is on
panel.external_sd.spi_cs_pin     1.23                  # set spi chip select for the sdcard (or any spare pin)
panel.external_sd.sdcd_pin       1.31!^                # sd detect signal (set to nc if no sdcard detect) (or any spare pin)

panel.menu offset                1                 # Some panels will need 1 here
```

Q: the computer cannot recognize the SKR motherboard?

A: check whether smoothieware-usb-driver-v1.1 driver is installed. You can download and install it on the open source website. After installation, connect the computer and SKR motherboard with usb cable.

Q: after changing the configuration file and inserting the motherboard, the firmware failed to be updated successfully?

A: check that the SD card's firmware.bin file is all in the right format, and that it is
Lowercase, filename is correct.

Q: after changing the configuration file by yourself, the LCD12864 screen cannot be displayed?

A: find the screen configuration information in the configuration file and make changes against the following