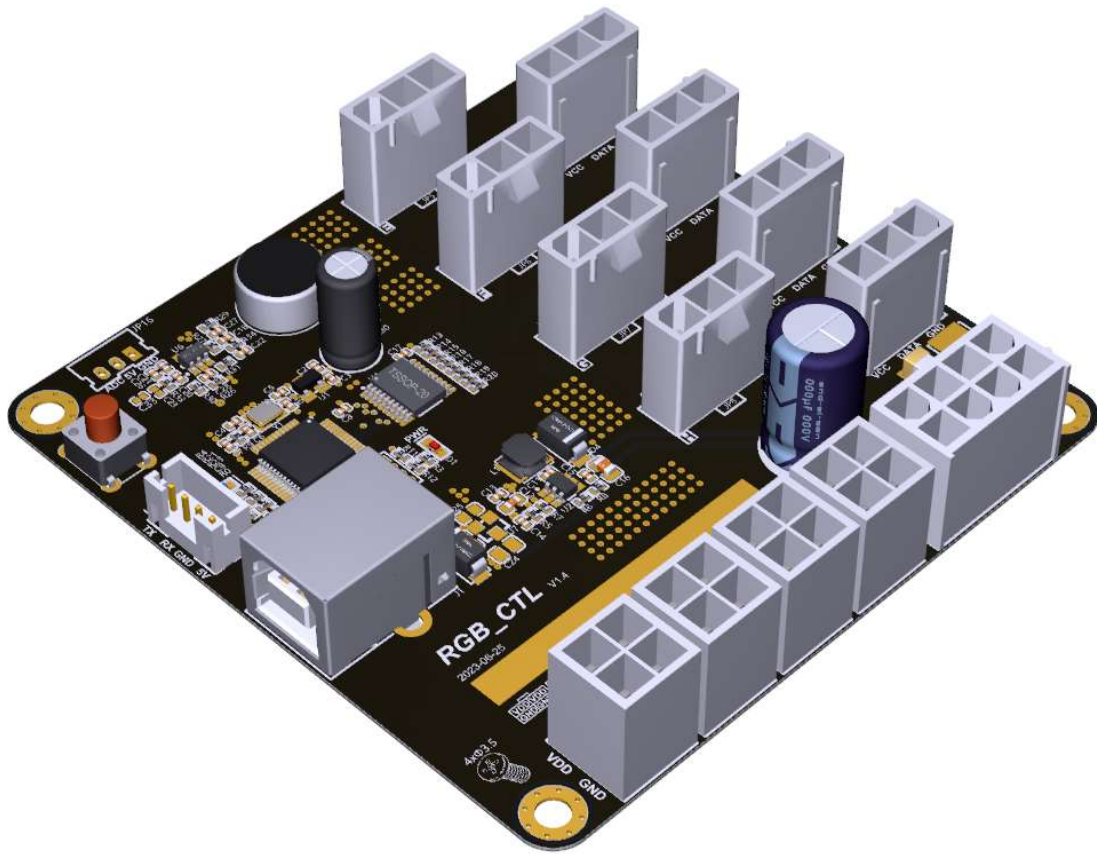


# Specification for Lamp Strip Control Board

## 灯带控制板产品规格书



**RGB\_CTL V1.4**

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# 1. General Description(概述)

## 1.1 Brief Introduction(简介)

RGB\_CTL V1.4 is a control board based on WS281x light strips, which can simultaneously control up to 8 different light strips. The 8 light strips are independently controlled and do not interfere with each other.

RGB\_CTL V1.4 是一款基于 WS281x 灯带的控制板，最多可同时控制 8 条不同灯带，8 条灯带独立控制，互不干扰。

## 1.2 Features and function(特点功能)

- Support up to 8 light strips for independent control;  
最多支持 8 条灯带独立控制;
- Each light strip can support up to 1024 lights;  
每条灯带最多支持 1024 颗灯;
- Support USB control, which can directly control 8 light strip modes through Windows upper computer software;  
支持 USB 控制，可通过 windows 上位机软件直接控制 8 条灯带模式;
- Supporting serial port control, each light on each light strip can be controlled through serial port commands;  
支持串口控制，可通过串口指令控制每条灯带上的每一颗灯;
- The USB port comes with a virtual serial device, which can send serial instructions through software such as a serial assistant ;  
USB 端口自带虚拟串口设备，可通过串口助手等软件发送串口指令;
- On board Electret microphone, supporting rhythm light function;  
板上自带驻极体麦克风，支持节奏灯功能;
- Industrial grade standard design, supporting long-term use at -40~+85℃;  
工业级标准设计，支持-40~+85℃下长时间使用;
- Equipped with a fuse to prevent excessive current from burning out;  
板上自带保险丝，可防止电流过大烧毁;

## 2. Specification parameters(规格参数)

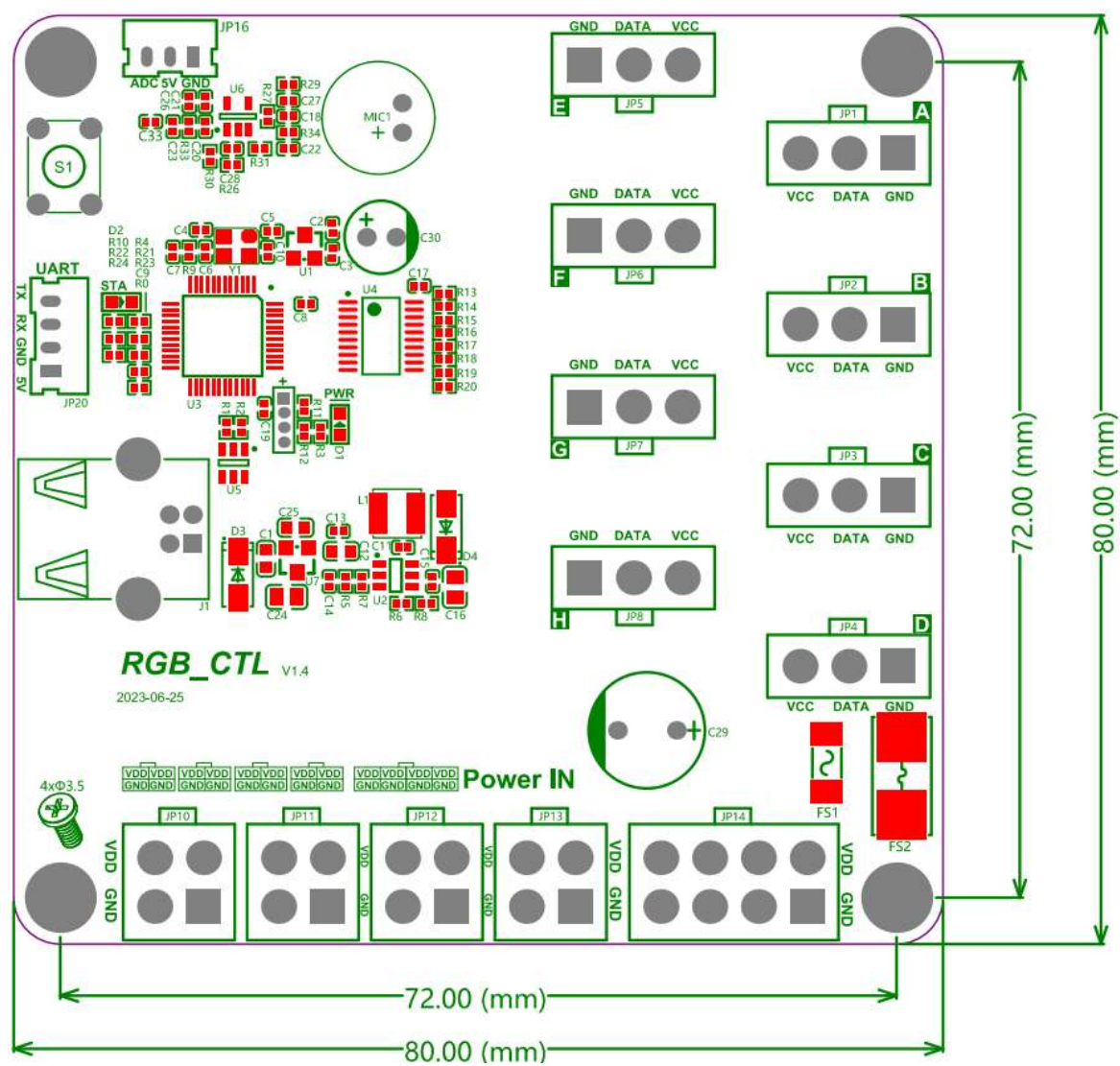
### 2.1 limit parameter(极限参数)

| Parameters<br>主要参数                 | Min<br>最小值 | Max<br>最大值 | Notes(备注)                                                 |
|------------------------------------|------------|------------|-----------------------------------------------------------|
| supply voltage<br>电源电压 (V)         | 4.75       | 40         | Permanently burned modules exceeding 40V<br>超过 40V 永久烧毁模块 |
| Power supply current<br>电源电流 (A)   | -          | 40         | Exceeding 40A will burn out the fuse<br>超过 40A 会烧毁保险丝     |
| operation temperature<br>工作温度 (°C) | -40        | 85         | Industrial grade<br>工业级                                   |

### 2.2 Operation parameters(工作参数)

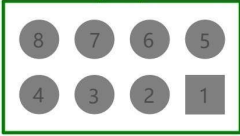
| Parameters<br>主要参数                       | Min<br>最小值 | Typical<br>典型值 | Max<br>最大值 | Notes(备注)                                                         |
|------------------------------------------|------------|----------------|------------|-------------------------------------------------------------------|
| working voltage<br>工作电压 (V)              | 5          | 12             | 24         | Supports 5V, 12V, and 24V light strips<br>支持 5V、12V、24V 灯带        |
| Serial communication level<br>串口通信电平 (V) |            | 3.3V           |            | There is a risk of burning when using a 5V level<br>使用 5V 电平有烧毁风险 |
| operation temperature<br>工作温度(°C)        | -40        |                | 85         |                                                                   |
| Sound sensitivity<br>声音灵敏度(dB)           | -          | -50            | -          |                                                                   |

### 3. Size (尺寸)



## 4. Interface Definition(接口定义)

### 4.1 JP14: Main Power Connector (2\*4pin/4.2)(主电源供电插座)

| <div><div>JP14</div></div> |            |                                                    |
|-------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------|
| NO.(引脚)                                                                                                     | Symbol(定义) | Description(描述)                                    |
| 1                                                                                                           | GND        | Ground(地)                                          |
| 2                                                                                                           | GND        |                                                    |
| 3                                                                                                           | GND        |                                                    |
| 4                                                                                                           | GND        |                                                    |
| 5                                                                                                           | VDD        | +5V、+12V or +24V Power Supply(+5V 、+12V 或者+24V 供电) |
| 6                                                                                                           | VDD        |                                                    |
| 7                                                                                                           | VDD        |                                                    |
| 8                                                                                                           | VDD        |                                                    |

### 4.2 JP10: Main Power Connector (2\*2pin/4.2)(主电源供电插座)

| <div><div>JP10</div></div> |            |                                                    |
|---------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------|
| NO.(引脚)                                                                                                       | Symbol(定义) | Description(描述)                                    |
| 1                                                                                                             | GND        | Ground(地)                                          |
| 2                                                                                                             | GND        |                                                    |
| 3                                                                                                             | VDD        | +5V、+12V or +24V Power Supply(+5V 、+12V 或者+24V 供电) |
| 4                                                                                                             | VDD        |                                                    |

JP11, JP12, JP13, and JP10 have the same sub pin definitions。

JP11、JP12、JP13 与 JP10 座子引脚定义相同。

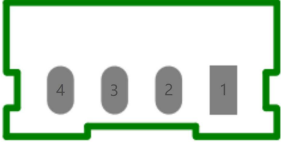
### 4.3 JP1: light strips Connector (1\*3pin/4.2)(灯带插座)

| <div><div>JP1</div></div> |            |                                      |
|--------------------------------------------------------------------------------------------------------------|------------|--------------------------------------|
| NO.(引脚)                                                                                                      | Symbol(定义) | Description(描述)                      |
| 1                                                                                                            | GND        | Ground(地)                            |
| 2                                                                                                            | DATA       | Control data signal output(控制数据信号输出) |
| 3                                                                                                            | VCC        | Power supply LED (LED 灯带电源)          |

JP2~JP8 and JP1 have the same sub pin definitions。

JP2~JP8 与 JP1 座子引脚定义相同。

4.4 JP20: UART control Connector (4PIN/2.0)(串口控制插座)

|  |            |                               |
|-----------------------------------------------------------------------------------|------------|-------------------------------|
| NO.(引脚)                                                                           | Symbol(定义) | Description(描述)               |
| 1                                                                                 | 5V         | +5V Power Supply(+5V 供电)      |
| 2                                                                                 | GND        | Ground(地)                     |
| 3                                                                                 | RX         | Serial Data Receiver(数据接收)    |
| 4                                                                                 | TX         | Serial Data Transmitter(数据传输) |

## 5. Instructions for use (使用说明)

### 5.1 Current Instructions (电流说明)

First, understand the maximum current required for the light strip to receive RGB\_CTL V1.4. If you are unsure of the current required for the light strip, you can calculate it using the following method:

先了解接到 RGB\_CTL V1.4 的灯带需要的电流最大是多少, 如果不清楚灯带需要的电流, 可按照下面的方法计算:

$$\begin{aligned} \text{Number of RGB lights on the light strip} \times 60\text{mA} \div 1000 &= \text{xx A} \\ \text{灯带上的 RGB 灯数} \times 60\text{mA} \div 1000 &= \text{xx A} \end{aligned}$$

For example, if the number of RGB lights on the light strip is 60, the maximum current of this light strip is:  $(60 \times 60) / 1000 = 3.6\text{A}$

例如灯带上 RGB 灯数为 60, 那这条灯带最大的电流是:  $(60 \times 60) / 1000 = 3.6\text{A}$ .

In the above formula, the current value of an RGB lamp is 60mA, because the maximum current of an LED lamp of a pixel is 20mA normally, and an RGB lamp is composed of three LEDs: red, green, and blue. However, the estimation lamp Charged current requires each RGB lamp to display white(red+green+blue) at maximum brightness. Although it is rarely used to turn on all pixels in this way, larger power supplies can achieve maximum security and reliability.

上面的公式一个 RGB 灯电流取值 60mA, 是因为正常一个像素的 LED 灯最大电流是 20mA, 一个 RGB 灯由红、绿、蓝三个 LED 组成, 而估算灯带电流要求每个 RGB 灯均以最大亮度显示白色(红色+绿色+蓝色), 虽然实际使用很少会这样打开所以像素, 但更大的电源可实现最大的安全性和可靠性。

Of course, the above calculation is the current of one light strip. If multiple light strips are connected, the current of each light strip needs to be added up.

当然, 上面计算的是一条灯带的电流, 如果接入多条灯带, 需把把每条灯带的电流相加。

Usage scenario (使用场景):

① RGB\_CTL V1.4 can withstand a maximum current of 40A, so the usage environment exceeds 40A. Please do not connect the VCC of the light strip to the JP1~JP8 sockets of RGB\_CTL V1.4;

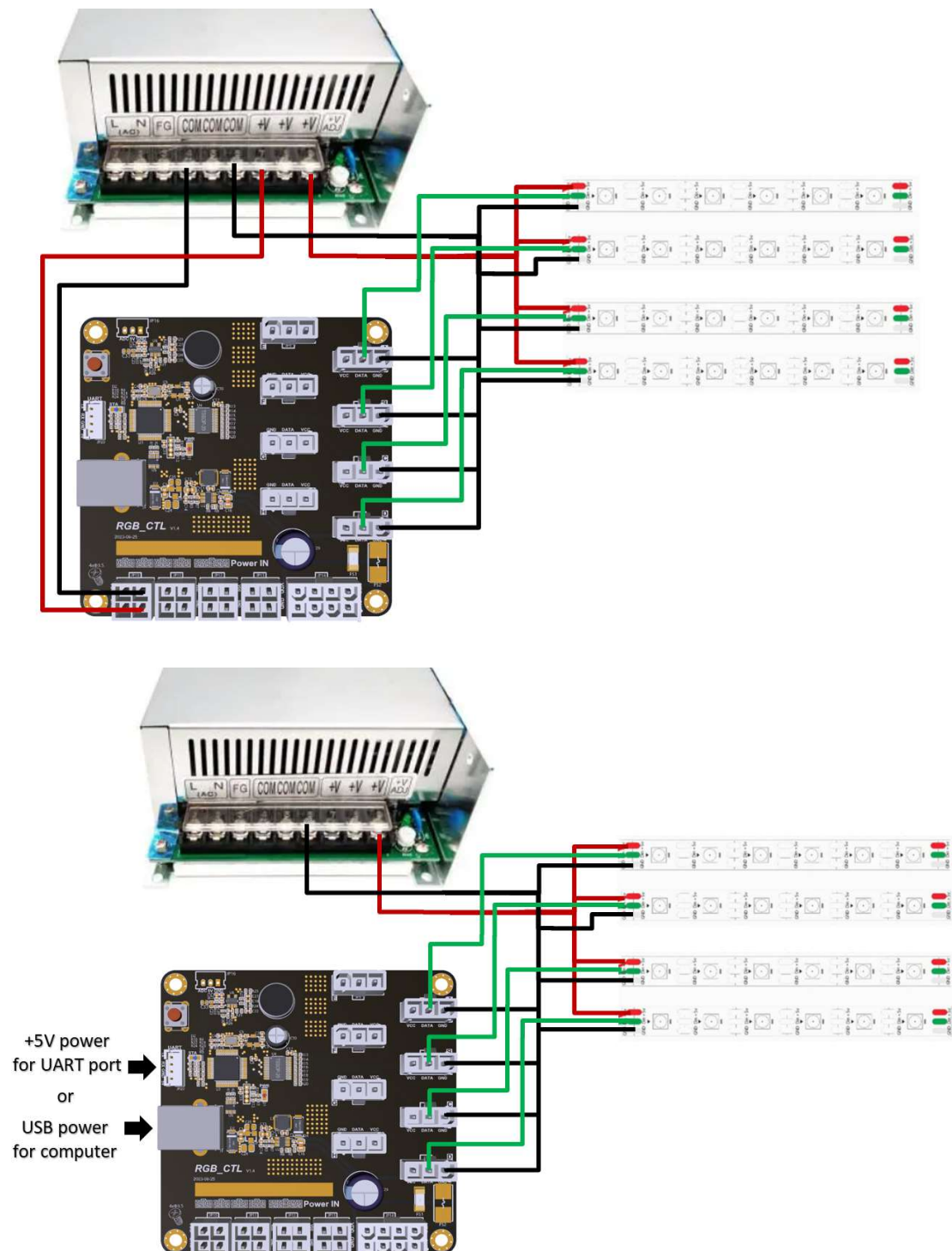
RGB\_CTL V1.4 最高可承受 40A 的电流, 所以使用环境超过 40A, 灯带的 VCC 请不要接到 RGB\_CTL V1.4 的 JP1~JP8 座子上;

② The maximum current that the RGB\_CTL V1.4 light strip control seat (JP1~JP8) can withstand is 9A, so when the current of a light strip exceeds 9A, please do not connect the VCC of the light strip to the RGB\_CTL V1.4 light strip control seat;

RGB\_CTL V1.4 的灯带控制座子(JP1~JP8)最高能承受的电流是 9A, 所以一条灯带的电流超过 9A 时, 灯带的 VCC 请不要接到 RGB\_CTL V1.4 的灯带控制座子上;



The following two power supply methods are recommended for the above two usage scenarios:  
以上两种使用场景推荐使用下面两种供电方式：



## 5.2 Power supply instructions（供电说明）

JP10~JP13 and JP14 are power supply sockets for RGB\_CTL V1.4. The maximum rated current for JP10~JP13 is 9A, while JP14 is 18A. Therefore, when the current required by the light strip exceeds the maximum rated current of a single power supply socket, multiple power supply sockets need to be connected simultaneously.

JP10~JP13、JP14 为 RGB\_CTL V1.4 的供电座子，JP10~JP13 最大额度电流是 9A，JP14 是 18A，所以当灯带需求的电流超过单个供电座子的最大额度电流时，这时需要同时接多个供电座子。

# Revision History（修订历史）

| Version<br>（版本） | Revision date<br>（修订日期） | Revision Description<br>（修订说明） | Maintainer<br>（维护人） |
|-----------------|-------------------------|--------------------------------|---------------------|
| 1.0             | 2023-7-1                | first edition（初版）              | Neo.Liang           |
|                 |                         |                                |                     |
|                 |                         |                                |                     |