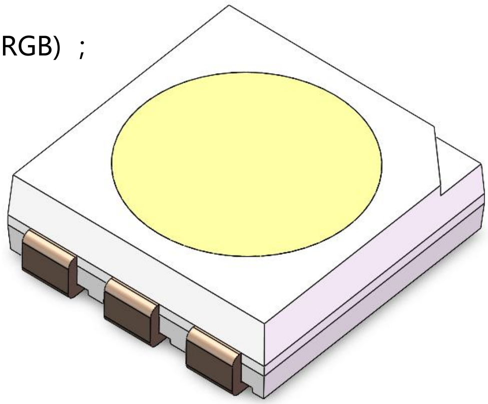
# Product Specification

| | |
|---|---|
| SAP料号 SAP part No. : | 10201T6803A50002A0 |
| 产品型号 Product P/N : | SK6803HV-6P-000 |
| 样 品 号 SAP part No. : | NMD000343-002 |
| 客户料号 Client P/N : | NA |
| 版 本 号 Version No. : | A/1 |
| 时 间 Sending Date : | 2024-12-02 |

# 目 录 Catalogue

## 1.产品概述 Product overview:



- 工作电压：12V@2.1mA(OUT RGB) ；

Forward voltage: VCC：12V, VDD：A:10-13.5V/B：3.5-5.5V:@2.1mA (OUT RGB) ；

- 发光角度：120° ；

Typical view angle 50%:120 ° ；

- 胶体颜色：半透明；

Lens color: translucent ；

- 内置复位电路，上电不亮灯；

Built-in reset circuit, power does not light ；

- 灰度调节：256级；

Grayscale adjustment：256 levels ；

- 单线归零码传输协议，可无限级联；

Single-line zero code transmission protocol, can be infinite cascade；

- 数据传输频率可达800Kbps， 当刷新速 30帧/秒，级联数 小于1024点；

The data transmission frequency can reach 800Kbps, and when the refresh rate is 30 frames per second, the number of cascades is not less than 1024 points ；

- 湿敏等级：5a ；

MSL：5a ；

- 静电ESD：2KV；

ESD level: 2KV；

- 符合RoHS REACH；

RoHS and REACH-compliant；

## 2.主要应用 Main applications:

- 消费电子产品

Consumer electronics

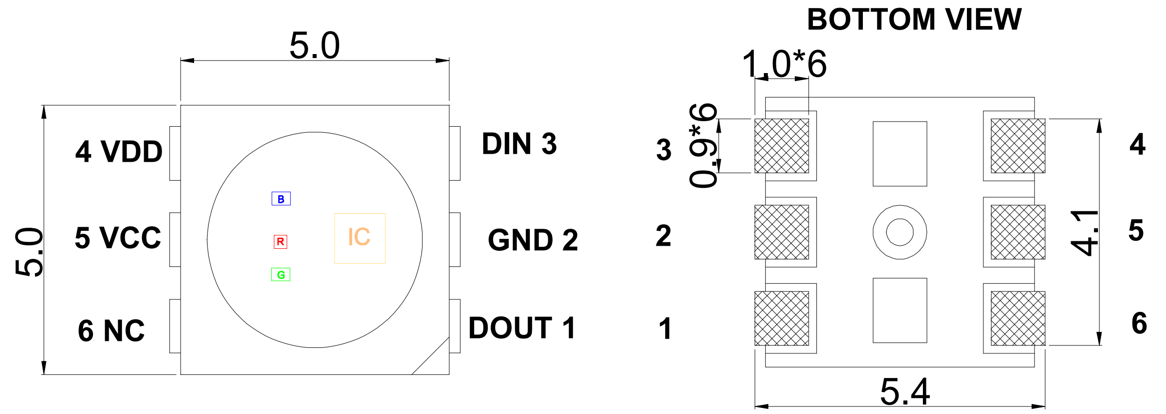
## 3. 产品命名一般说明 General instructions for product naming：

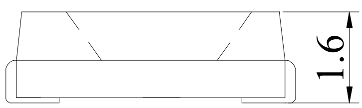
SK 6803 HV -P6-000

① ② ③ ④ ⑤

| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| 系列<br>Series | Ic系列与电流代码<br>IC series and current codes | 工作电压<br>Operating voltage | 支架脚位数量代码<br>Bracket pin number code | 内部编码<br>Internal code |
| 默认为GRB晶片与IC集成在一起<br>Default to GRB chip integrated with IC | 6803：指68系列IC ；2.1mA电流版本<br>Refers to the 68 series IC; 2.1mA current version | HV:指12V 工作电压产品<br>12V working voltage product | P6:指六脚产品；<br>Hexapod product | 000:内部编码<br>Internal code |

## 4.机械尺寸 Mechanical dimensions:



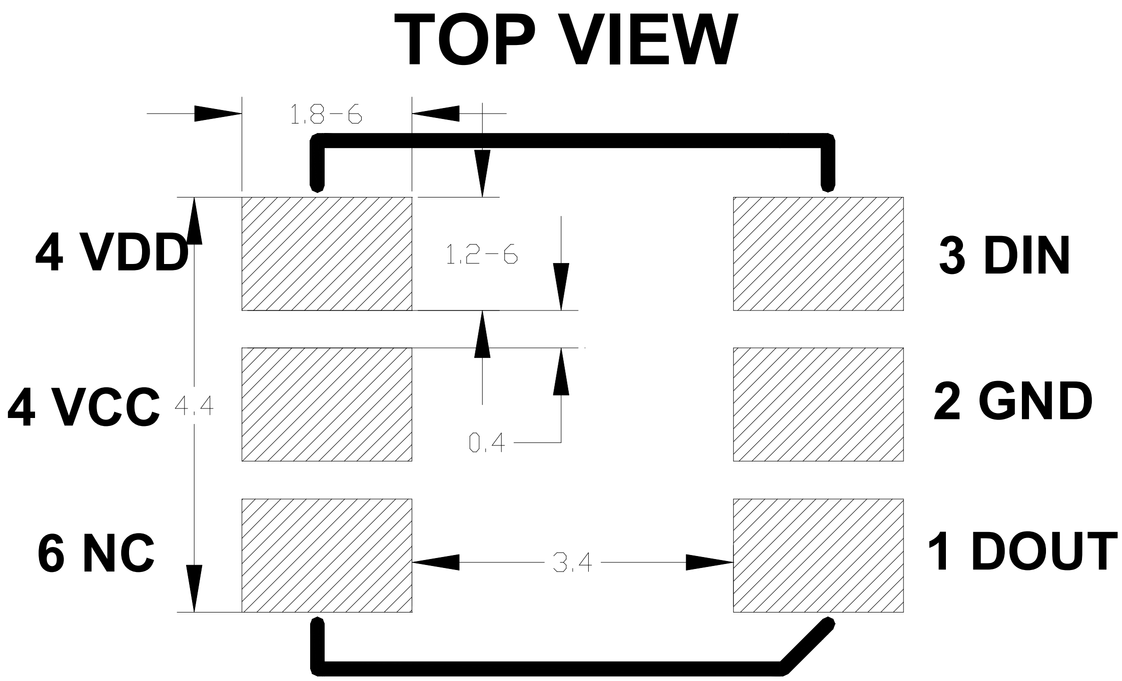




备注 notes:
1. 以上标示单位为毫米.
The above markings are in millimeters
2. 除非另外注明，尺寸公差为 ±0.1毫米.
Unless otherwise specified, the dimensional tolerance is ± 0.1 millimeters

## 5. 引脚功能说明 Pin Function Description：

| 序号<br>Serial number | 符号<br>Symbol | 管脚名<br>Pin name | 功能描述<br>Function description |
|---|---|---|---|
| 1 | DOUT | 数据输出<br>Data output | 控制数据信号输出<br>Control data signal output |
| 2 | GND | 地<br>Grounds | 电源接地<br>Power grounding |
| 3 | DIN | 数据输入<br>Data input | 控制数据信号输入<br>Control data signal input |
| 4 | VDD | 电源<br>Power supply | IC供电管脚<br>IC power supply pin |
| 5 | VCC | 电源<br>Power supply | RGB供电管脚<br>RGB power supply pin |
| 6 | NC | 空脚<br>Empty feet | 空置脚位<br>Vacant footrest |

## 6.PCB建议焊盘尺寸 PCB recommended pad size：




## 7.IC极限参数 IC limit parameter ：（Ta=25℃ ）

| 参数<br>Parameter | 符号<br>Symbol | 范围<br>Range | 单位<br>Unit |
|---|---|---|---|
| 逻辑电源电压<br>Working voltage | $V_{DD}$ | A:+10+13.5(VDD VCC 12V供电)<br>B:+3.5-5.5（VDD VCC分开供电） | V |
| 工作温度<br>Operation temperature | Topt | -40~+85 | ℃ |
| 储存温度<br>Storage temperature | Tstg | -40~+85 | ℃ |
| ESD耐压（人体模式）<br>ESD withstand voltage (human mode) | $V_{ESD}$ | 2K | V |

## 8. GRB LED 光电参数 Optoelectronic parameters：

| 颜色 Colour | SK6803HV-P6-000 2.1mA | |
|---|---|---|
| | 波长（nm) Wavelength（nm) | 亮度（mcd) Brightness（mcd) |
| 红色（RED) | 615-625 | 320-580 |
| 绿色（GREEN) | 520-530 | 697.5-1162.5 |
| 蓝色（BLUE) | 465-475 | 140-280 |

注：亮度误差±10%，波长误差±1.0nm;

Note:Luminous Intensity: ±10%Iv, Dominant Wavelength: ±1.0nm.

## 9. IC电气参数 IC electrical parameters：（TA=25℃）

| 参数 parameter | 符号 symbol | 最小 minimum | 典型 typical | 最大 maximum | 单位 unit | 测试条件 Test conditions |
|---|---|---|---|---|---|---|
| 工作电压 Chip input voltage | $V_{CC}$ | 10 | 12 | 13.5 | V | --- |
| 信号输入翻转阈值 Signal input flip threshold | $V_{IH}$ | 0.5*VDD | --- | --- | V | +VDD=5.0V |
| | $V_{IL}$ | --- | --- | 0.3*VDD | V | |
| B/G/R输出驱动电流 B/G/R output drive current | $I_{DOUT}$ | --- | 2.1 | --- | mA | $V_{DS}$=1.5V |
| PWM频率 PWM frequency | $F_{PWM}$ | --- | 4.6 | --- | KHz | --- |
| 静态功耗 Static power consumption | $I_{DD}$ | --- | 0.17 | --- | mA | VDD=5V |
| | | --- | 0.20 | --- | | VDD=12V |
| 数据传输速率 Transfer rate | $F_{DIN}$ | --- | 800 | --- | Kbps | |

## 10. 建议数据传输时间 Suggested data transmission time：

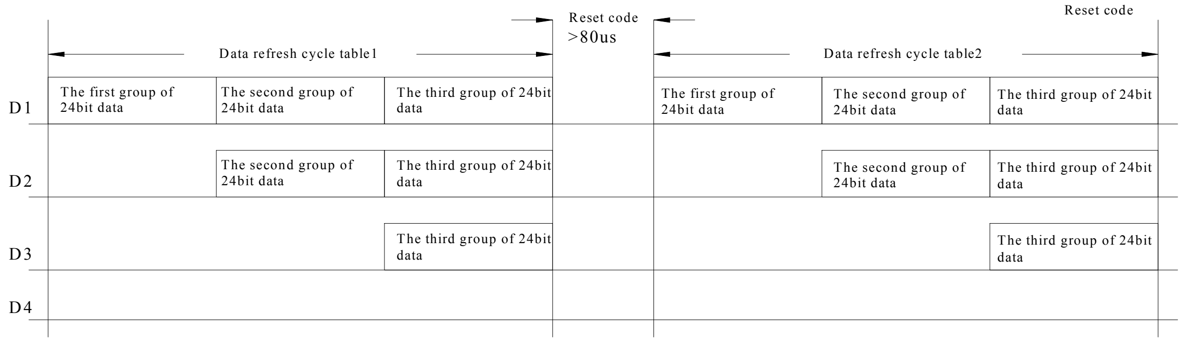
| 时序表名称<br>Timeline Name | | Min. | 实际值<br>actual value | Max. | 单位<br>unit |
|---|---|---|---|---|---|
| T | 码元周期<br>Symbol period | 1.20 | -- | -- | μs |
| T0H | 0码， 高电平时间<br>0 code, high-level time | 0.30 | 0.32 | 0.35 | μs |
| T0L | 0码， 低电平时间<br>0 code, low-level time | 0.80 | -- | -- | μs |
| T1H | 1码， 高电平时间<br>1 code, high-level time | 0.75 | 0.85 | 1.00 | μs |
| T1L | 1码， 低电平时间<br>1 code, low-level time | 0.20 | -- | -- | μs |
| Reset | Reset码，低电平时间<br>Reset code, low-level time | >200 | -- | -- | μs |

1. 协议采用单极性归零码，每个码元必须有低电平，本协议的每个码元起始为高电平，高电平时间宽度决定“0”码或“1”码。
The protocol adopts unipolar zeroing code, and each symbol must have a low level. Each symbol in this protocol starts with a high level, and the duration of the high level determines the "0" or "1" code.

2. 书写程序时，码元周期最低要求为1.2μs。
When writing a program, the minimum required code period is 1.2 μ s.

3. “0”码、 “1”码的高电平时间需按照上表的规定范围， “0”码、 “1”码的低电平时间要求小于20μs。
The high-level time of "0" and "1" codes should be within the specified range in the table above, and the low-level time of "0" and "1" codes should be less than 20 μ s.

## 11.数据传输方式 Data transmission method：（ Ta=25℃ ）

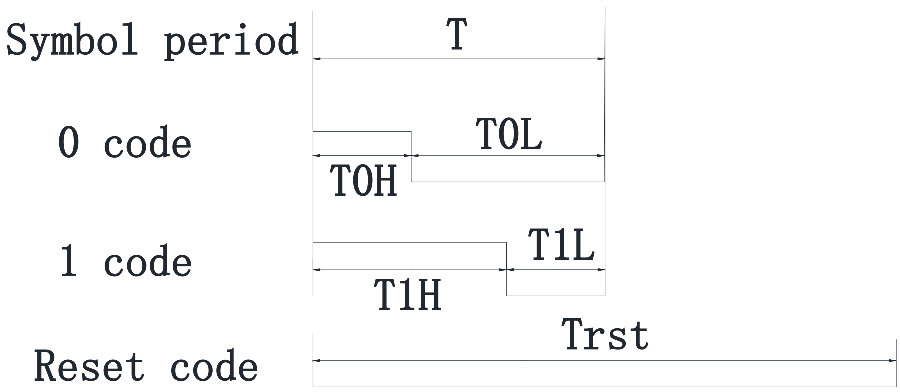



注Note： 其中D1为MCU端发送的数据，D2、D3、D4为级联电路自动整形转发的数据。

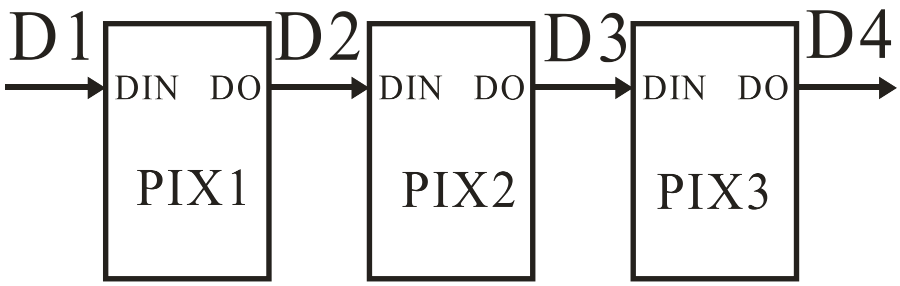
Among them, D1 is the data sent by the MCU end, and D2, D3, and D4 are the data automatically shaped and forwarded by the cascaded circuit.

## 12.时序波形图 Time series waveform diagram：（Ta=25℃）

输入码型 Input code type：




连接方式 Connection method：



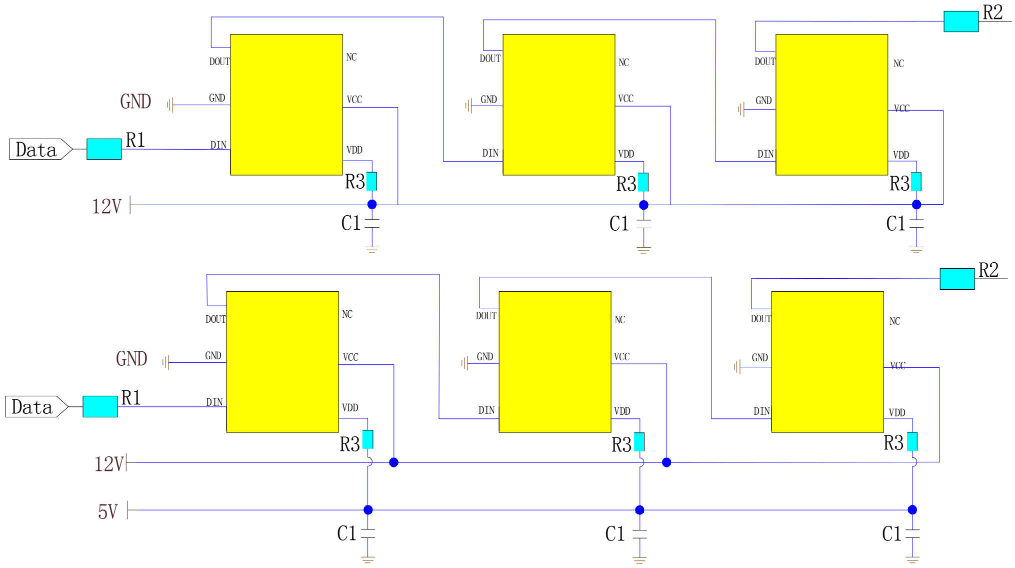

## 13. 24bit数据结构 24 bit data structure：（Ta=25℃）

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G7 | G6 | G5 | G4 | G3 | G2 | G1 | G0 | R7 | R6 | R5 | R4 |
| R3 | R2 | R1 | R0 | B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 |

注Note：高位先发，按照**GRB**的顺序发送数据**(G7 →G6 →……..B0)**

**High bit first send, send data in GRB order (G7 → G6 →.... B0)**

## 14.应用电路原理图 Principles of Applied Circuits：




在实际应用电路中，为防止产品在测试时带电插拔产生的瞬间高压损伤IC输入输出引脚，应在VDD，信号输入及输出端串接保护电阻。此外，为了使各IC芯片间更稳定工作，各灯珠间的退偶电容则必不可少；

In the practical application circuit, in order to prevent the instantaneous high-voltage damage caused by the product being plugged and unplugged during the test, the internal signal input and output pins of the IC should be connected in series at the VDD, signal input and output terminals. In addition, in order to make the IC chips work more stable, the retreat capacitance between the lamp beads is indispensable;

应用一：用于软灯条或硬灯条的，灯珠间传输距离短的，建议在VDD，信号及输入输出端各串接保护电阻，即R1，R2约500 Ω ，VDD端12V供电时，R3约1KΩ，VDD端5V供电时，R3约100Ω，以实际使用情况定；

Application 1: For soft light bar or hard light bar, it is recommended that the input and output terminals of the signal in VDD, R1, R2 about 500 Ω, VDD end 12V, R3 about 1 KΩ, R DD end 5V, about 100 Ω, R3 for the actual use situation；

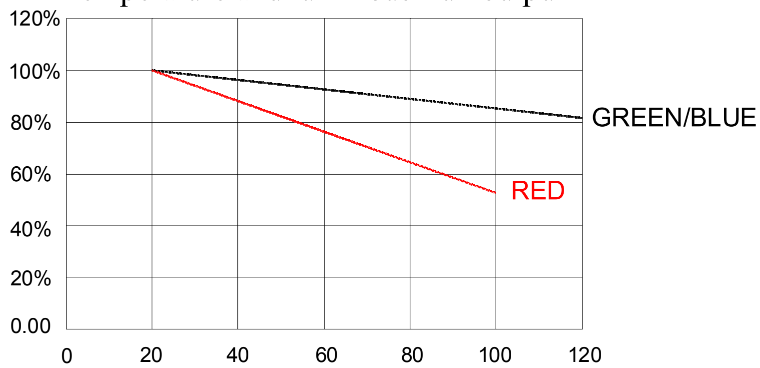
应用二：用于模组或一般异形产品，灯珠间传输距离长，因线材及传输距离不同，在VDD，信号线两端串接的保护电阻会略有不同；以实际使用情况定；

Application 2: For modules or general special-shaped products, the transmission distance between lamp beads is long. Due to the different wire and transmission distance, the protection resistance at both ends of the signal line will be slightly different in VDD; it depends on the actual use;

## 15. 光电特性 Photoelectric characteristic：

焊盘温度与光通量输出的相对关系
The relative relationship between pad temperature and luminous flux output

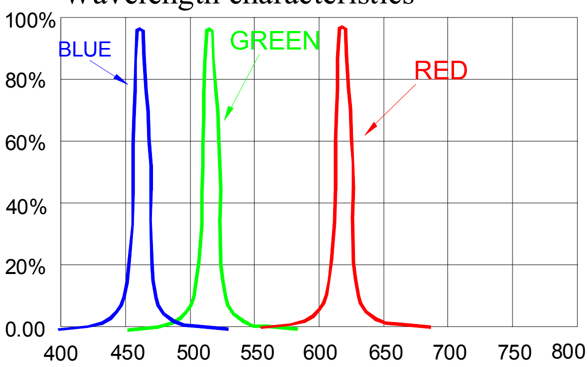
相对光通量
Relative luminous flux




焊盘温度
Pad temperature

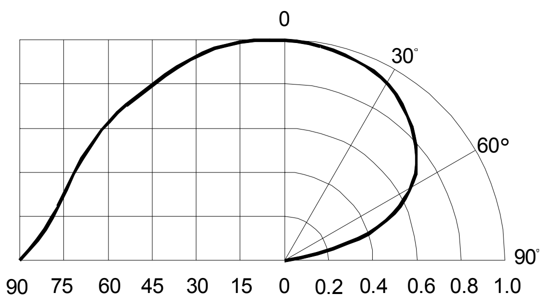
波长特性
Wavelength characteristics

相对光谱分布图
Relative spectral distribution map




波长wavelength (nm)

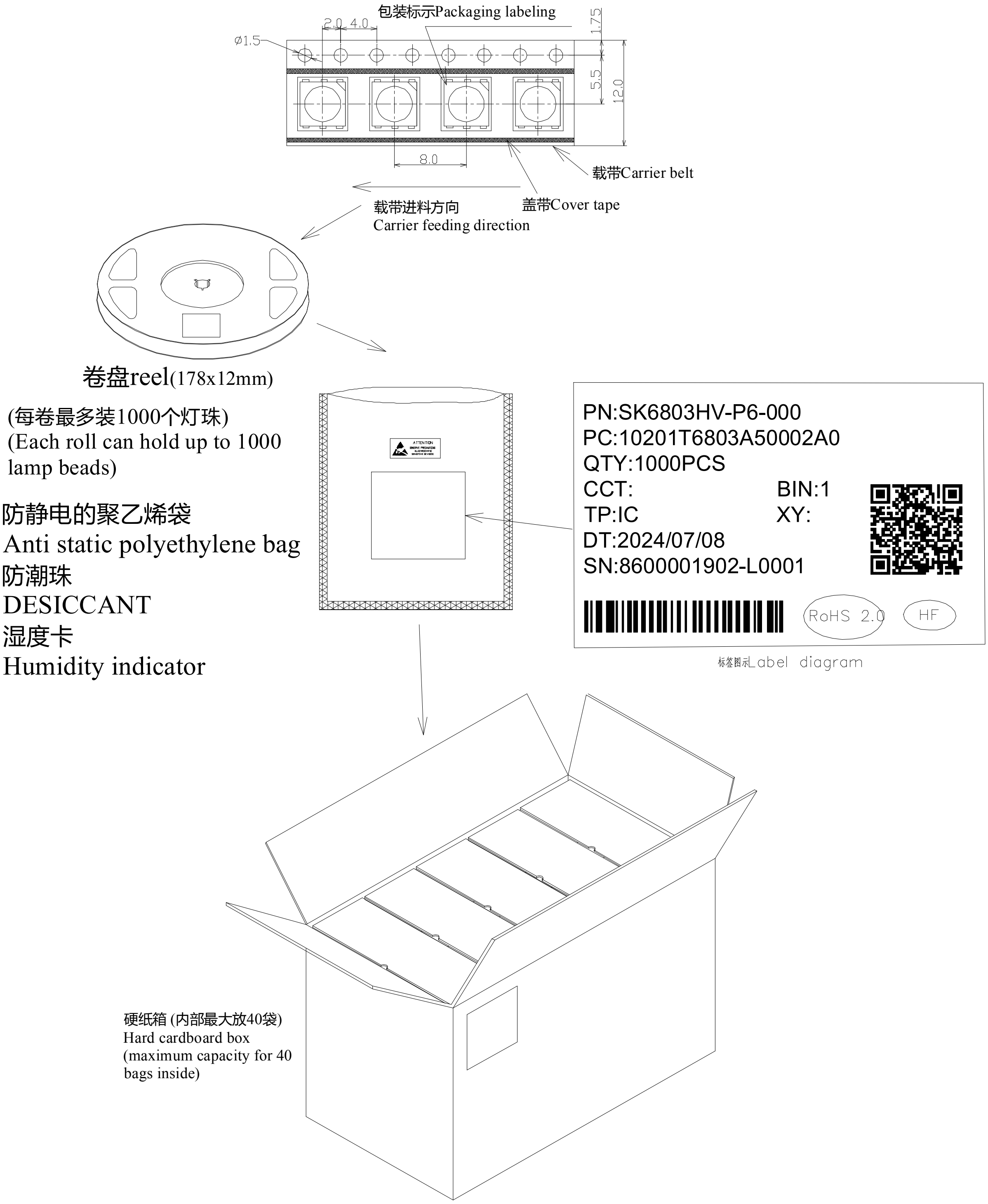
典型的辐射方向图 120°
Typical radiation pattern 120°




辐射角度
Radiation angle

## 16. 包装标准 Packaging standards：

**SK6803HV-P6-000**




表面贴装LED采用卷盘包装，LED在用普通或防静电袋包装后再装在纸箱中. 纸箱用于保护运输途中LED不受机械冲击，纸箱不防水，因此请注意防潮防水。

Surface mounted LEDs are packaged in rolls, and the LEDs are packaged in regular or anti-static bags before being packed in cardboard boxes The cardboard box is used to protect the LED from mechanical impact during transportation. The cardboard box is not waterproof, so please pay attention to moisture-proof and waterproof.

## 17. 可靠性测试 Reliability testing:

| 序号<br>serial number | 实验项目<br>Pilot projects | 实验条件<br>Experimental condition | 参考标准<br>Reference standards | 判断<br>Determine |
|---|---|---|---|---|
| 1 | 冷热冲击<br>Thermal Shock | 100 ± 5°C ~ -40°C ± 5°C<br>15min~15min 100cycles | MIL-STD-202G | 0/22 |
| 2 | 高温储藏<br>High temperature storage | Ta= +100ºC 1000hrs | JEITA ED-4701<br>200 201 | 0/22 |
| 3 | 低温储藏<br>Low temperature storage | Ta= -40ºC 1000hrs | JEITA ED-4701<br>200 202 | 0/22 |
| 4 | 高温高湿储藏<br>High temperature and high humidity storage | Ta=60ºC RH=90% 1000hrs | JEITA ED-4701<br>100 103 | 0/22 |
| 5 | 温度循环<br>Temperature cycling | -40ºC~25ºC~100ºC~25ºC<br>30min~5min~30min~5min<br>100 cycles | JEITA ED-4701<br>100 105 | 0/22 |
| 6 | 耐焊接热<br>Resistance to Soldering Heat | Tsld = 260°C, 10sec. 2 times | JEITA ED-4701<br>300 301 | 0/22 |
| 7 | 常温寿命测试<br>Normal temperature life test | 25°C, IF: Typical current , 1000hrs | JESD22-A 108D | 0/22 |

## 失效判定标准 Failure criteria:

| 项目<br>Project | 符号<br>Symbol | 测试条件<br>Test conditions | 判断标准Judgment criteria | |
|---|---|---|---|---|
| | | | 最小值<br>Minimum value | 最大值<br>Maximum value |
| 发光强度<br>Intensity | IV | DC=5V,规格典型电流<br>DC=5V, Typical current specification | 初始数据X0.7<br>Initial data X0.7 | --- |
| 耐焊接热<br>Resistance to Soldering Heat | --- | DC=5V,规格典型电流<br>DC=5V, Typical current specification | 无死灯或明显损坏<br>No dead lights or obvious damage | |

## 修订记录 Revision record

| 日期<br>Date | Rev. No. | 修改/改变的原因<br>Reason for modification/change | 签名<br>Signature |
|---|---|---|---|
| 2024-08-22 | / | 临时规格Temporary specifications | Zhang Wei You |
| 2024-09-02 | A/0 | 首次发行 first issue | Zhang Wei You |
| 2024-12-02 | A/1 | 修正产品概述、IC极限参数、电性参数、应用电路原理图 Revised product overview, IC limit parameters, electrical parameters, application circuit schematic diagram | Zhang Wei You |
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