

产品规格书

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1.产品概述 Product overview:

- 工作电压：5V@12mA (OUT WWW) ；
Forward voltage: 5V@12mA (OUT WWW) ；

- 发光角度：120° ；
Typical view angle 50%:120° ；

- 胶体颜色：荧光胶 ；
Lens color: Fluorescence glue ；

- 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 ；

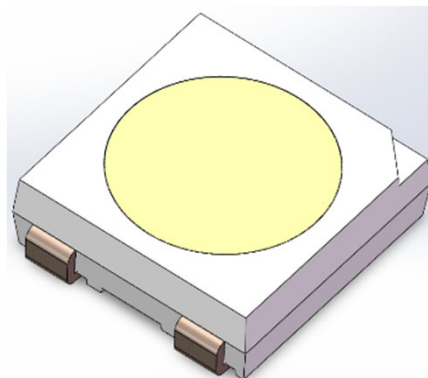
- 单线归零码传输协议，可无限级联 ；
Single-line zero code transmission protocol, can be infinite cascade ；

- 数据传输频率可达800Kbps，当刷新速率30帧/秒时，级联数不小于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

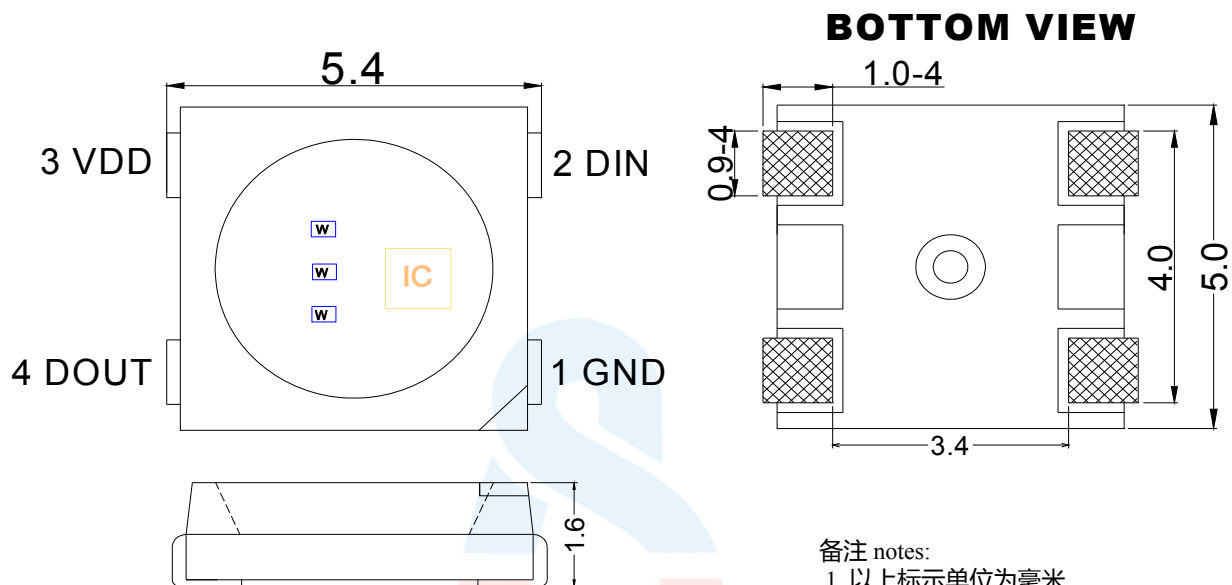
3. 产品命名一般说明 General instructions for product naming :

SK 6812-BW-001

① ② ③ ④

①	②	③	④
系列 Series	IC 系列与电流代码 IC series and current codes	颜色代码 Color codes	内部编码 Internal code
默认为GRB晶片与IC集成在一起 Default to GRB chip integrated with IC	6812：指68系列IC；12mA电流版本 Refers to the 6812 series IC;12mA current version	BW:正白 Blue White 5700-7500K	001:内部编码 Internal code

4.机械尺寸 Mechanical dimensions:



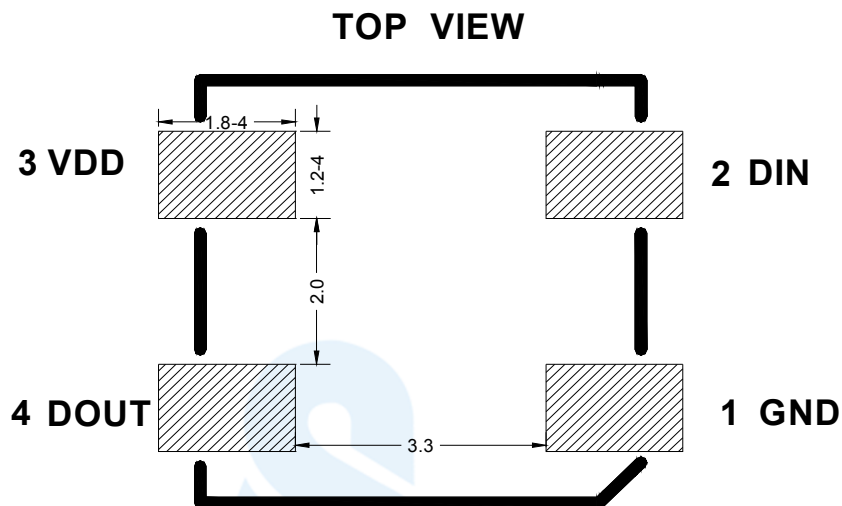
备注 notes:

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 Serial Number	符号 Symbol	管脚名 Pin name	功能描述 Function Description
1	GND	地 Grounds	电源接地 Power grounding
2	DIN	数据输入 Data input	控制数据信号输入 Control data signal input
3	VDD	电源 Power supply	供电管脚 Power supply pins
4	DOUT	数据输出 Data output	控制数据信号输出 Control data signal output

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



7.IC极限参数 IC limit parameter : (Ta=25°C)

参数 Parameter	符号 Symbol	范围 Range	单位 Unit
逻辑电源电压 Working voltage	V_{DD}	+3.7 ~ +5.5	V
工作温度 Operation temperature	T_{opt}	-40~+85	°C
储存温度 Storage temperature	T_{stg}	-40~+85	°C
ESD耐压 (人体模式) ESD withstand voltage (human mode)	V_{ESD}	2K	V

8. GRB LED 光电参数 Optoelectronic parameters :

颜色 Colour	SK6812-BW-001 12mA	
	色温 Color temperature (k)	亮度 Brightness (mcd)
三通道白光(Three-channel white light)	5700-7500	3850-5800

注：亮度误差±10%，色温误差±100K;

Note:Luminous Intensity: ±10%Iv, Color temperature: ±100K.

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 _{DD}	3.7	5.0	5.5	V	---
信号输入翻转阈值 Signal input flip threshold	V _{IH}	0.7*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}	10	12	14.5	mA	V _{DS} =1V
PWM频率 PWM frequency	F _{PWM}	---	1.0	---	KHz	---
静态功耗 Static power consumption	I _{DD}	---	0.6	---	mA	---
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 Timeline name	Min.	实际值 Actual value	Max.	单位 Unit
T	1.20	--	--	μs
T0H	0.20	0.30	0.40	μs
T0L	0.80	--	--	μs
T1H	0.60	0.67	1.00	μs
T1L	0.20	--	--	μs
Reset	>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.

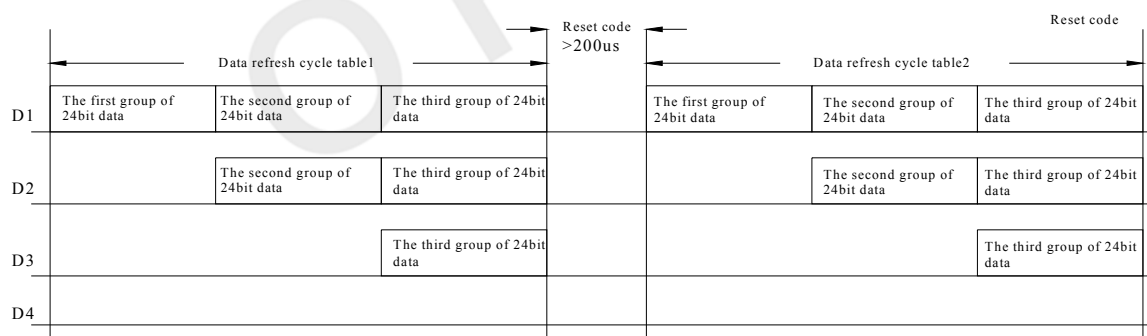
2. 书写程序时，码元周期最低要求为1.2μs。

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°C)

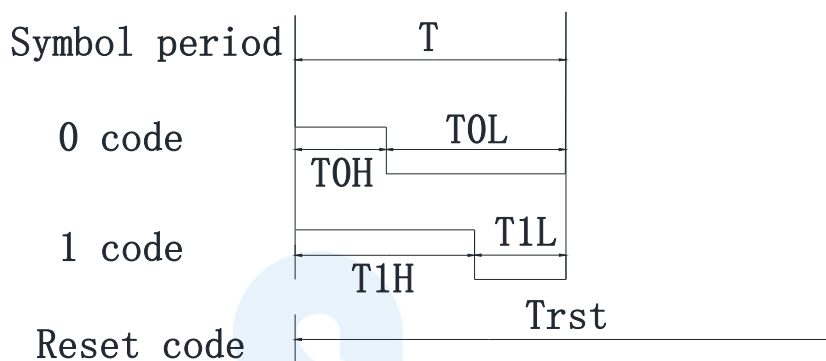


注Note：其中D1为MCU端发送的数据，D2、D3、D4为级联电路自动整形转发的数据。

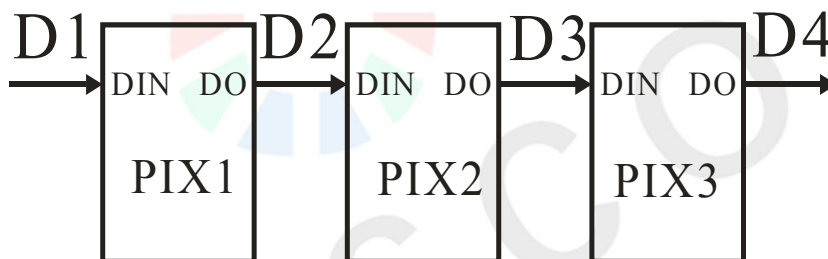
Among them, D1 is the data sent by the MCU end, and D2, D3, and D4 are the data automatically shaped and forwarded by the cascaded circuit.

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

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°C)

W7	W6	W5	W4	W3	W2	W1	W0	W7	W6	W5	W4
W3	W2	W1	W0	W7	W6	W5	W4	W3	W2	W1	W0

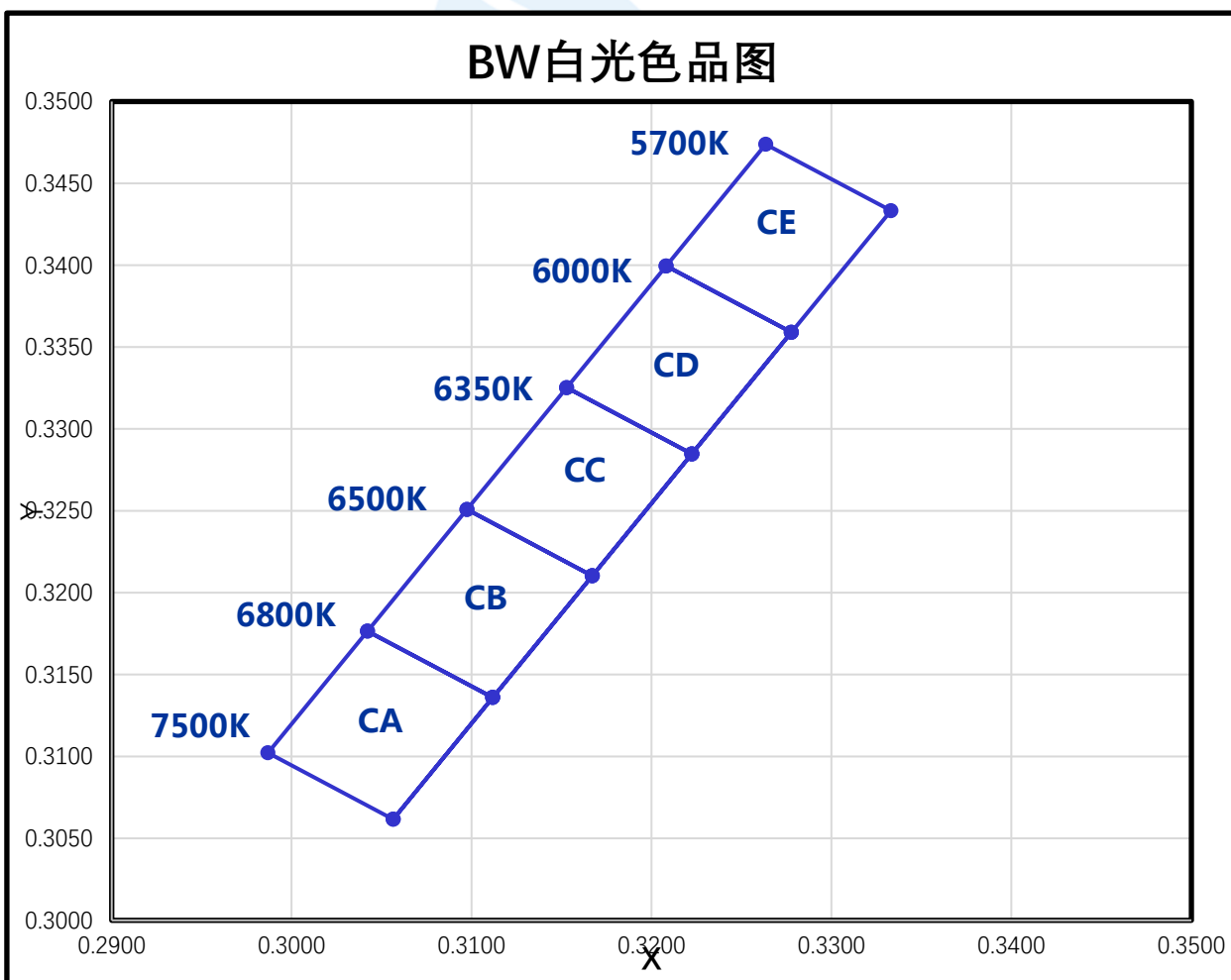
注Note : 高位先发, 按照WWW的顺序发送数据(W7 → W6 →.....W0)

High bit first send, send data in WWW order (W7 → W6 →.... W0)

14. 白光色温等级及CIE颜色等级划分 (指1931 CIE色度图) White light color temperature level and CIE color level classification (referring to the 1931 CIE chromaticity chart)

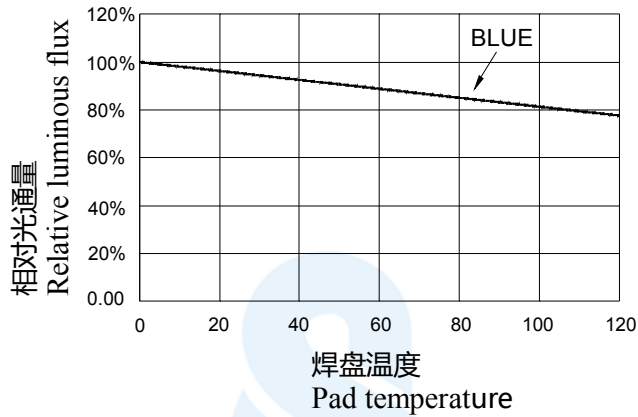
Name	X1	Y1	X2	Y2	X3	Y3	X4	Y4
CA	0.3056	0.3062	0.2987	0.3102	0.3042	0.3177	0.3112	0.3136
CB	0.3112	0.3136	0.3042	0.3177	0.3098	0.3251	0.3167	0.321
CC	0.3167	0.321	0.3098	0.3251	0.3153	0.3325	0.3223	0.3285
CD	0.3222	0.3285	0.3153	0.3325	0.3208	0.34	0.3278	0.3359
CE	0.3278	0.3359	0.3208	0.34	0.3264	0.3474	0.3333	0.3433

白光分级形式

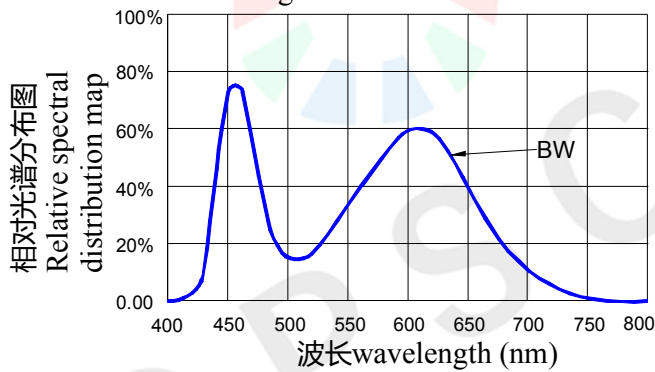


15. 光电特性 Photoelectric characteristic :

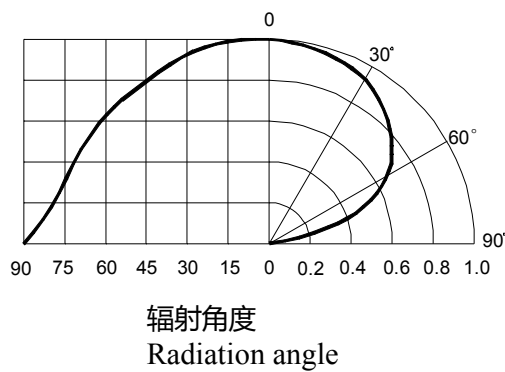
焊盘温度与光通量输出的相对关系
 The relative relationship between pad temperature and luminous flux output



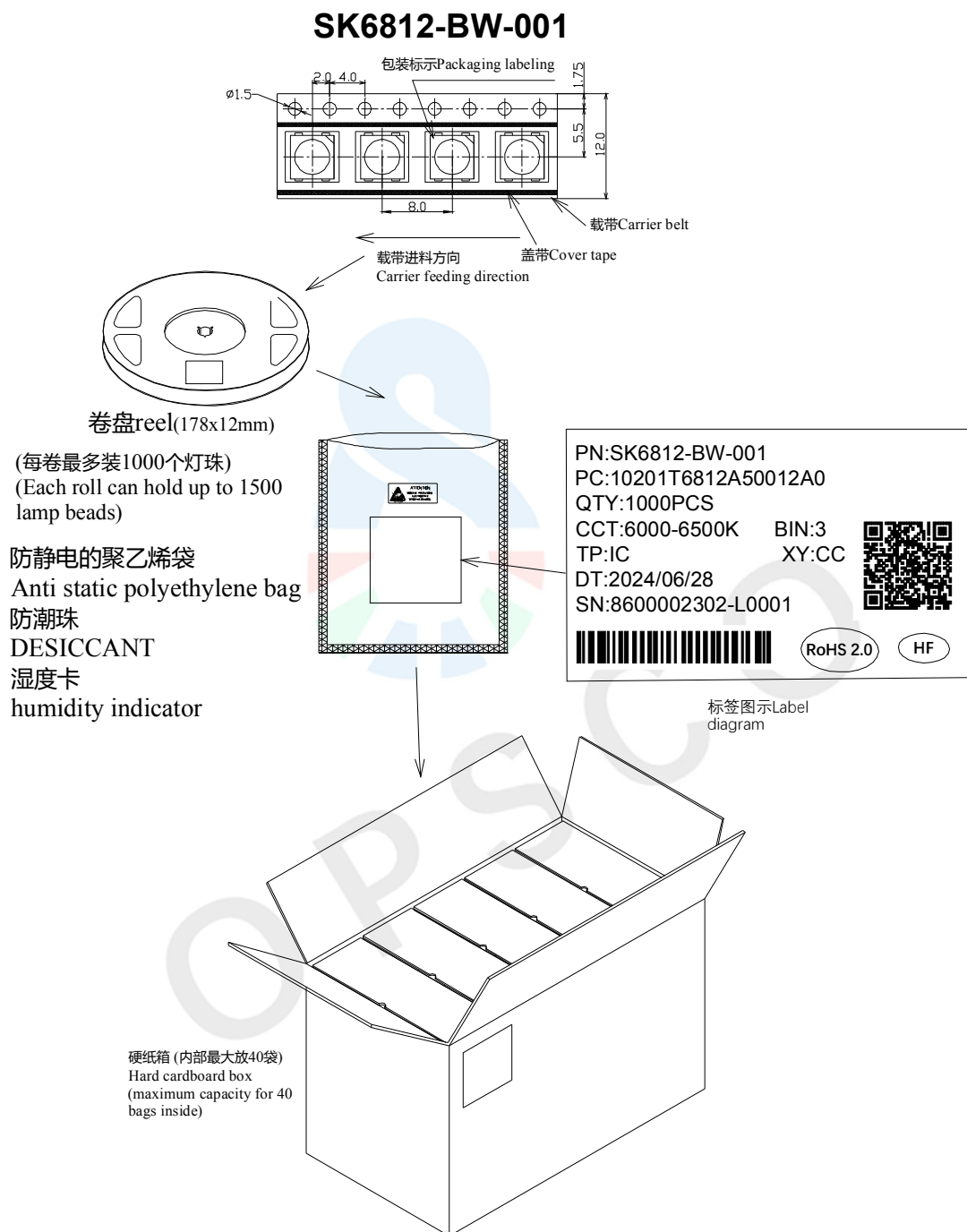
波长特性
 Wavelength characteristics



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



16. 包装标准 Packaging standards :



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 Serial Number	实验项目 Pilot projects	实验条件 Experimental condition	参考标准 Reference standards	判断 Determine
1	冷热冲击 Thermal Shock	100 ± 5°C ~ -40°C ± 5°C 15min~15min 100cycles	MIL-STD-202G	0/22
2	高温储藏 High temperature storage	Ta= +100°C 1000hrs	JEITA ED-4701 200 201	0/22
3	低温储藏 Low temperature storage	Ta= -40°C 1000hrs	JEITA ED-4701 200 202	0/22
4	高温高湿储藏 High temperature and high humidity storage	Ta=60°C RH=90% 1000hrs	JEITA ED-4701 100 103	0/22
5	温度循环 Temperature cycling	-40°C~25°C~100°C~25°C 30min~5min~30min~5min 100 cycles	JEITA ED-4701 100 105	0/22
6	耐焊接热 Resistance to Soldering Heat	Tsld = 260°C, 10sec. 2 times	JEITA ED-4701 300 301	0/22
7	常温寿命测试 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 Project	符号 Symbol	测试条件 Test conditions	判断标准 Judgment criteria	
			最小值 Minimum value	最大值 Maximum value
发光强度 Intensity	IV	DC=5V,规格典型电流 DC=5V, Typical current specification	初始数据X0.7 Initial data X0.7	---
耐焊接热 Resistance to Soldering Heat	---	DC=5V,规格典型电流 DC=5V, Typical current specification	无死灯或明显损坏 No dead lights or obvious damage	

修订记录 Revision record

日期 Date	Rev. No.	修改/改变的原因 Reason for modification/change	签名 Signature
2021-10-26	A/0	首次发行 First issue	Kevin Zhu
2024-06-28	B/0	1.更改规格书版式 1.Change the layout of the specification sheet 2.升级IC 电气参数 2.Upgrade IC electrical parameters	Tony Wu