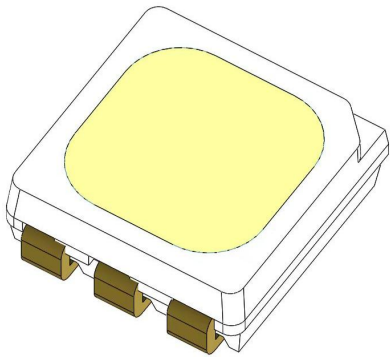
Product Specification

SAP料号 SAP part No. :	10201T9822D35000A0
产品型号 Product P/N :	SK9822MINI-HB-000
样 品 号 SAP part No. :	NMD000363-000
客户料号 Client P/N :	NA
版 本 号 Version No.:	B/4
时 间 Sending Date :	2026-10-23

目 录 Catalogue

1、产品概述 Overview 3
2、主要应用 Main applications 3
3、产品命名一般说明 General instructions for product naming 3
4、机械尺寸 Mechanical dimensions 4
5、引脚功能说明 Pin Function Description 4
6、PCB建议焊盘尺寸 PCB recommended pad size 5
7、IC极限参数 IC limit parameter 5
8、RGB LED光电参数 RGB LED Optoelectronic parameters 6
9、IC电气参数 IC electrical parameters 6
10、功能说明 Function Description 7-9
11、典型应用电路 Typical application circuit 10
12、光电特性 Photoelectric characteristic 11
13、包装标准 Packaging standards 12
14、可靠性测试 Reliability testing 13

1.产品概述 Product overview:



- 工作电压：5V@18mA可调(OUT BGR)；
  Forward voltage: 5V@18mA Adjustable (OUT BGR)；
- 发光角度：120°；

Luminescent angle: 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，电流增益：5Bit(32级)；

Grayscale adjustment：256 levels，current gain: 5Bit (level 32)；

- SPI 传输协议，双线数据传输，可无限级联；

SPI transmission protocol, dual line data transmission, infinite cascading capability；

- 最大串行输入数据频率15MHZ；

Maximum serial input data frequency 15MHz；

- 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

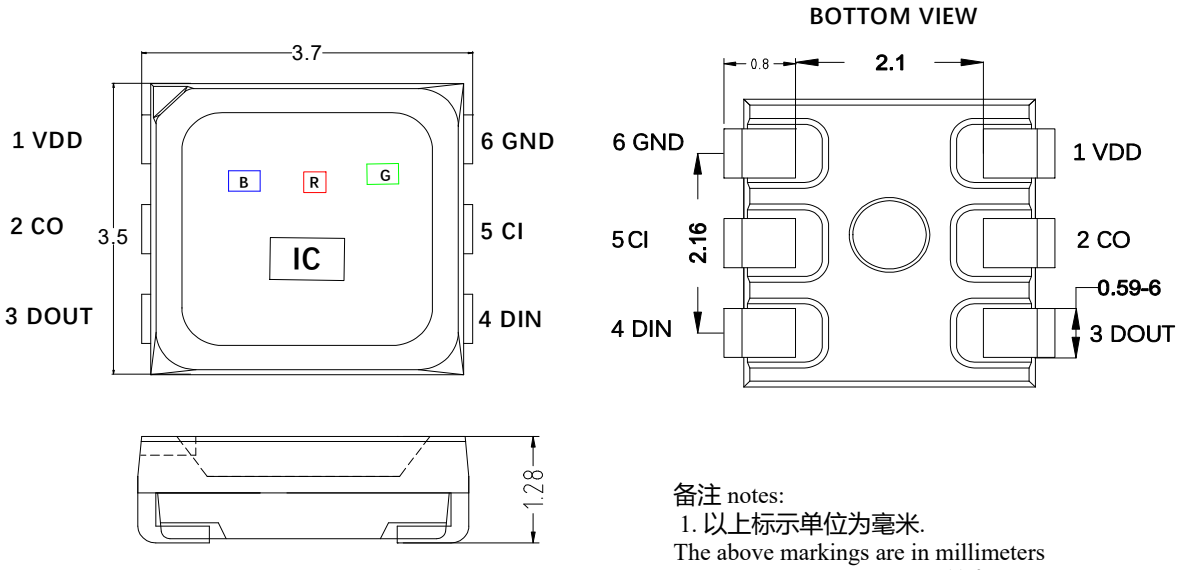
3. 产品命名一般说明 General instructions for product naming：

SK 9822 MINI-HB-000

① ② ③ ④

①	②	③	④
系列 Series	Ic系列与电流代码 IC series and current codes	封装外形 Package outline dimensions	内部编码 Internal code
默认为RGB晶片与IC集成在一起 Default to RGB chip integrated with IC	指9822系列，双线低灰传输 IC，18MA电流版本 Refers to the 9822 series dual wire low gray transmission IC 18MA current version	MINI-HB:指封装尺寸为3.7*3.5*1.28mm The package size is 3.7*3.5*1.28 mm	000:内部编码 Internal code

4.机械尺寸 Mechanical dimensions:

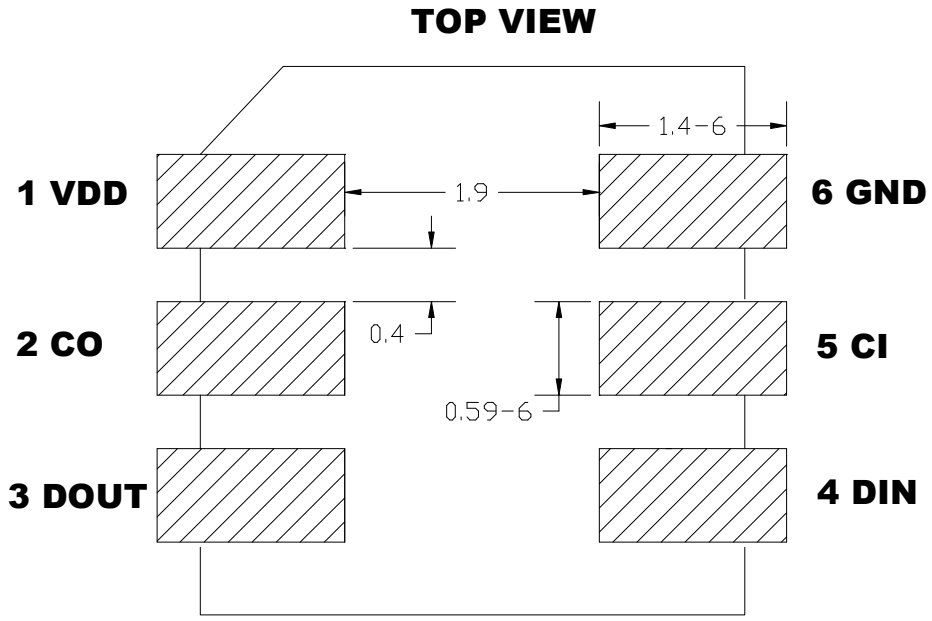


备注 notes:
1. 以上标示单位为毫米.
The above markings are in millimeters
2. 除非另外注明，尺寸公差为 ±0.1毫米.
Unless otherwise specified, the dimensional tolerance is ± 0.1 millimeters

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	VDD	供电电源正端 Positive end of power supply	电源正极 Positive of power supply
2	CO	时钟输出 Clock output	串接时钟信号输出端 Serial connection of clock signal output terminal
3	DOUT	数据输出 Data output	串接资料输出端 Serial data output terminal
4	DIN	数据输入 Data input	串接资料输入端 Serial data input terminal
5	CI	时钟输入 Clock input	串接时钟信号输入端 Serial connection of clock signal input terminal
6	GND	地或电源负端 Ground or power negative terminal	电源负极 Negative of power supply

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 Parameter	符号 Symbol	范围 Range	单位 Unit
逻辑电源电压 Working voltage	V_{DD}	+3.7～+5.3	V
工作温度 Operation temperature	Topt	-40~+80	℃
储存温度 Storage temperature	Tstg	-40~+80	℃
ESD耐压（人体模式） ESD withstand voltage (human mode)	V_{ESD}	2K	V

8. RGB LED 光电参数 Optoelectronic parameters：

颜色 Colour	SK9822MINI-HB-000 18mA	
	波长（nm） Wavelength（nm）	亮度（mcd） Brightness（mcd）
红色（RED）	615-625	320-580
绿色（GREEN）	520-530	815-1275
蓝色（BLUE）	460-470	160-320

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	VDD	3.7	5.0	5.3	V	---
信号输入翻转阀值 Signal input flip threshold	VIH	0.75VDD	---	---	V	---
	VIL	---	---	0.3VDD	V	---
R/B/G输出驱动电流 R/B/G output drive current	I_{DOUT}	---	20	---	mA	V_{DS}=1V
PWM频率 PWM frequency	F_{PWM}	---	1.2	---	KHz	---
静态功耗 Static power consumption	IDD	---	0.3	---	mA	---
数据传输速率 Transfer rate	F_{DIN}	---	800	---	Kbps	---

10. 功能说明 Function Description：

（1）串接资料结构Serial data structure

32个0 32 Zeros	芯片1数据 Chip 1 data	芯片2数据 Chip 2 data	芯片3数据 Chip 3 data	.....	芯片N数据 Chip N data	32个1
起始字节 Starting Byte	显示数据字节 Display data bytes	显示数据字节 Display data bytes	显示数据字节 Display data bytes	.....	显示数据字节 Display data bytes	结束数据字节 End data byte

显示数据字节 Display data bytes	111	5位亮度调整 5-bit brightness adjustment	8位蓝灯数据 8-bit blue light data	8位绿灯数据 8-bit green light data	8位红灯数据 8-bit red light data
		高位在前 MSB first	高位在前 MSB first	高位在前 MSB first	高位在前 MSB first

起始字节 Starting Byte	0000 0000	0000 0000	0000 0000	0000 0000

结束字节 END byte	1111 1111	1111 1111	1111 1111	1111 1111

产品输出结构：BGR顺序点亮，优化产品混色效果（调整IC默认BGR顺序晶片位置）；

Product output structure: BGR sequential lighting, optimizing product color mixing effect (adjusting IC default BGR sequential chip position);

（2）刷新率 Refresh rate

帧频 = 1/((64+(32*点数))*CKI 周期) （单位：帧/秒）

Frame rate=1/(64+(32 * points)) * CKI cycle) (unit: frames/second)

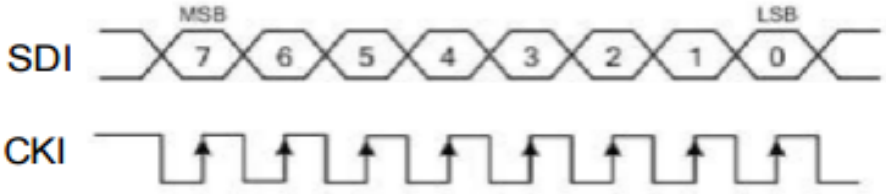
如：1024 个点，CKI 频率为 1MHZ，则 帧频=30 帧/秒

For example, if there are 1024 points and the CKI frequency is 1MHz, the frame rate is 30 frames per second

（3）256级灰度 256 level grayscale

数值Numerical value	占空比Duty cycle
MSB……..LSB	
0000 0000	0/256
0000 0001	1/256
0000 0010	2/256
- - - - -	- - - - -
1111 1101	253/256
1111 1110	254/256
1111 1111	255/256

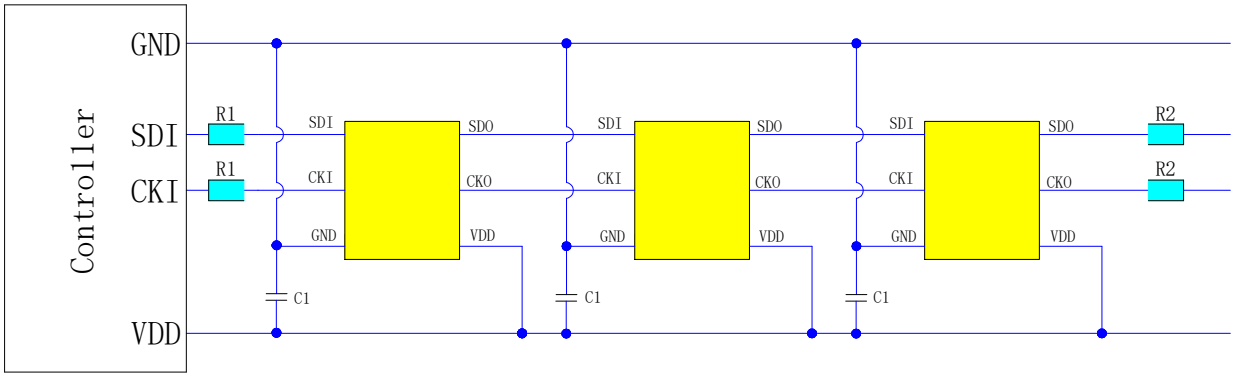
（4）PWM输入输出信号关系 PWM input-output signal relationship：



(5) 5-Bit(32级) 亮度调整（同时控制OUTR\OUTB\OUTG三个端口的电流 5-Bit (level 32) brightness adjustment (simultaneously controlling the current of the three ports OUTR, OUTB, and OUTG)：

电流调节等级 Current regulation level	数值(msb……..Lsb) Numerical value	电流调整 Current adjustment	对应电流值（ma) Corresponding current value	备注 Notes
1	00000	0/31	0	建议使用电流：1~22电流调节等级 Suggested use of current: 1-22 current regulation level
2	00001	1/31	0.581	
3	00010	2/31	1.162	
4	00011	3/31	1.743	
5	00100	4/31	2.324	
6	00101	5/31	2.905	
7	00110	6/31	3.486	
8	00111	7/31	4.067	
9	01000	8/31	4.648	
10	01001	9/31	5.229	
11	01010	10/31	5.81	
12	01011	11/31	6.391	
13	01100	12/31	6.972	
14	01101	13/31	7.553	
15	01110	14/31	8.134	
16	01111	15/31	8.715	
17	10000	16/31	9.296	
18	10001	17/31	9.877	
19	10010	18/31	10.458	
20	10011	19/31	11.039	
21	10100	20/31	11.62	
22	10101	21/31	12.201	
23	10110	22/31	12.782	基于产品散热，此款产品电流建议最大使用为：12.201mA，电流调节等级23~32级不建议使用 Based on product heat dissipation, it is recommended to use a maximum current of 12.201mA for this product. The current regulation level is 23-32, and it is not recommended to use it
24	10111	23/31	13.363	
25	11000	24/31	13.944	
26	11001	25/31	14.525	
27	11010	26/31	15.106	
28	11011	27/31	15.687	
29	11100	28/31	16.268	
30	11101	29/31	16.849	
31	11110	30/31	17.43	
32	11111	31/31	18	

11.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内部电源及信号输入输出脚，应在信号、时钟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；

1.产品两端所并的退偶电容一般不建议省略；

2.产品的信号、时钟输入及输出端必需串接保护电阻R1/R2，因线材及传输距离不同，在两端串接的保护电阻会略有不同； R1/R2的大小取决于级联灯珠的数量，级联数量越多，则R1/R2越小，灯珠间传输距离长，一般建议在20-2KΩ之间取值，通常建议取值在500欧左右；以实际使用情况定；

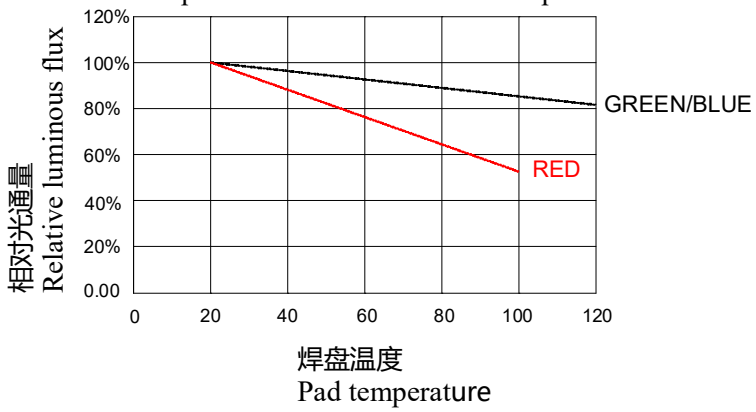
In practical application circuits, to prevent instantaneous high voltage damage to the internal power supply and signal, clock input/output pins of the IC caused by live plugging and unplugging during testing, protective resistors should be connected in series at the signal input and output terminals. In addition, in order to ensure more stable operation between IC chips, the decoupling capacitance between each LED is essential;

1. It is generally not recommended to omit the decoupling capacitance at both ends of the product;

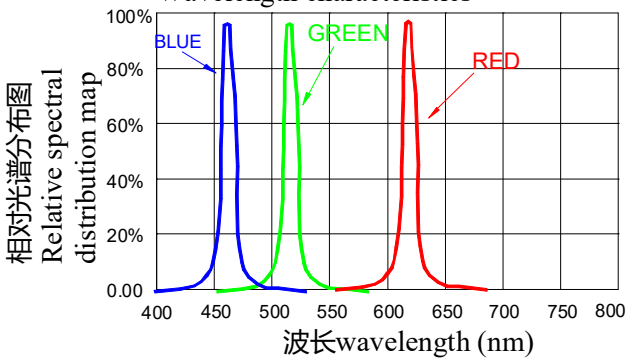
2. The signal, clock input and output terminals of the product must be connected in series with protective resistors R1/R2. Due to different wire materials and transmission distances, the protective resistors connected in series at both ends may vary slightly; The size of R1/R2 depends on the number of cascaded light beads. The more cascaded the number, the smaller the R1/R2, and the longer the transmission distance between the light beads. It is generally recommended to take a value between 20-2K Ω, and it is usually recommended to take a value of around 500 Ω; Based on actual usage;

12. 光电特性 Photoelectric characteristic：

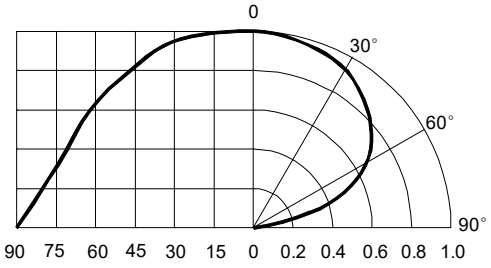
焊盘温度与光通量输出的相对关系
The relative relationship between pad temperature and luminous flux output



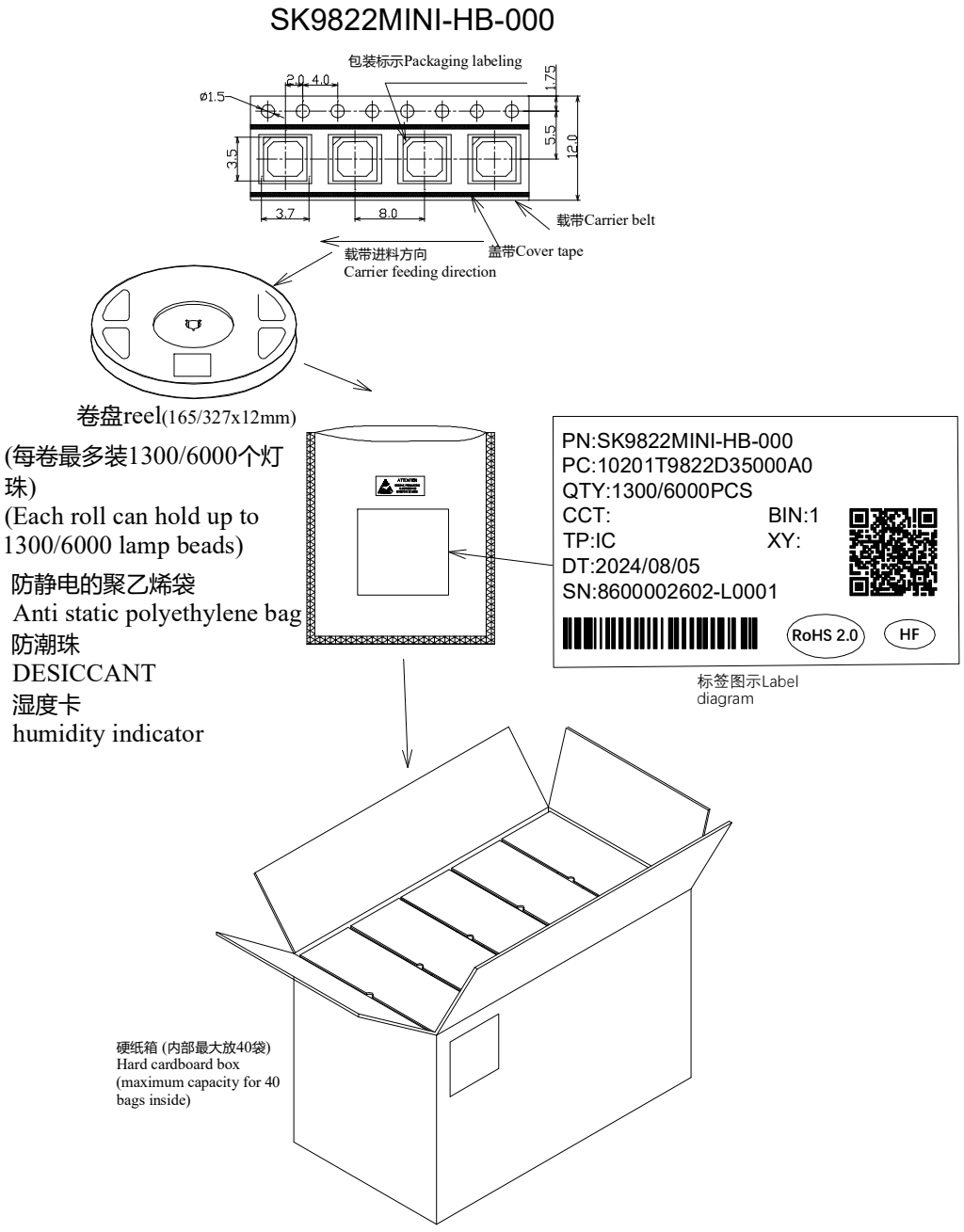
波长特性
Wavelength characteristics



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



13. 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.

14. 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= +100ºC 1000hrs	JEITA ED-4701 200 201	0/22
3	低温储藏 Low temperature storage	Ta= -40ºC 1000hrs	JEITA ED-4701 200 202	0/22
4	高温高湿储藏 High temperature and high humidity storage	Ta=60ºC RH=90% 1000hrs	JEITA ED-4701 100 103	0/22
5	温度循环 Temperature cycling	-40ºC~25ºC~100ºC~25ºC 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
2022-08-22	A/0	首次发行 First issue	Kevin Zhu
2023-08-03	A/1	更新应用电路与包装标准 Update application circuit and packaging standards	Liu Feng
2024-08-05	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
2024-10-12	B/1	1.修正“10.功能说明-串接资料结构” Revise "10. Function Description - Serial Data Structure"	Tony Wu
2025-09-19	B/2	更新电性参数 Update electrical parameters	Zhang Wei You
2026-01-26	B/3	1.更新公司名称 Update company name 2.更新电性参数 Update electrical parameters	Zhang Wei You
2026-10-23	B/4	更新电性参数 Update electrical parameters	Zhang Wei You