

# 深圳市超越光电有限公司

## 产品规格书 SPECIFICATION

产品名称 Product Name	5050幻彩灯珠 WS2812B	客户名称 Customer	
产品型号 Type	CY-C5050WS2812B-T1	客户料号 Customer PN	
版本号 Version	C1	日期 Date	2020/12/15

节能减排  
卓越创新



客户承认栏 Customer Approval			
制定 DRAW	审核 CHECK	核准 APPROVE	确认 CONFIRM
若英文译本与中文有异，以中文版本为准。 Should there be any inconsistencies between Chinese and English versions, the Chinese version shall prevail.			

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## 1、产品概述/Product Overview:

5050 内封 IC 灯珠是一款集成高质量单线级联恒流驱动 IC 和高质量 RGB LED 芯片的外控恒流 5050 集成灯珠。其中内置控制 IC 具有高可靠，低功耗，抗干扰性能高和恒流精度高的特点，而内部集成优选高质量的 LED 芯片，具有发光一致性优良，白光效果纯正，光衰小的优点。内封 IC 灯珠将 2 者优点相结合，同时带来体积小，外围元件少，版面干净的特点。通过外部控制器控制，可展现幻彩，动画以及高标准视频效果。/5050 IC bead is an integrated high-quality single-line cascade constant-current driver IC and high-quality RGB LED chip external constant-current 5050 integrated bead. The built-in control IC has the characteristics of high reliability, low power consumption, high anti-interference performance and high constant current precision, while the internal integration of high-quality LED chip, with good uniformity of luminescence, white light effect pure, light-fading small advantages. The enclosed IC lamp ball combines the advantages of the two, and at the same time brings the features of small volume, few peripheral elements and clean layout. Controlled by external controller, it can display illusion, animation and high standard video effect.

## 2、功能特点/Functional characteristics:

2.1 5050 灯珠内部集成高质量外控单线级联恒流 IC 和优质 RGB LED 芯片，体积小巧，外围简单。/The 5050 ball interior integrates high-quality external single-line cascade IC and high-quality RGB LED chips, which are small in size and simple on the periphery.

2.2 内置 IC 恒流精度高，内部 RGB 芯片预先分光处理。发光高度一致，白光效果纯正。此款灯珠可接受白光及其单色定制。/BUILT-IN IC constant current high precision, internal RGB chip pre-optical processing. High Degree of uniformity of light, white light effect pure. This lamp ball can accept white light and its monochrome customization

2.3 整形转发强化技术，单线数据传输，可无限级联。/Plastic forwarding enhancement technology, single-line data transmission, can be cascaded.

2.4 数据传输频率 800Kbps/秒，可实现画面刷新速率 30 帧 / 秒时，不小于 1024 点。/The data transmission frequency is 800Kbps per second, and the screen refresh rate can be achieved at 30 frames per second, not less than 1024 points.

2.5 输出端口 PWM 控制能够实现 256 级灰度调节，端口扫描频率 1.5KHz / s。/The output port PWM control can achieve 256 levels of grayscale adjustment, and the port scan frequency is 1.5 KHz / S.

2.6 采用优化预置 12mA/通道恒流模式，低压驱动级联数量最大化。高恒流精度，片内误差 < 1.5%，片间误差 < 3%。/Optimized preset 12mA / channel constant current mode is adopted to maximize the number of low-voltage drive cascades. High constant current accuracy, intraslice error < 1.5 %, interslice error < 3 %.

2.7 内置低压强化模块，VDD 在 2.7V 以上 100%正常工作。/With the built-in low-pressure reinforcement module, VDD is 100 % functional above 2.7 V.

2.8 超强数据整形能力：接受完本单元数据自动将后续数据整形输出。/Super data shaping ability: accept this unit data automatically will follow the data shaping output.

## 3、应用领域/Application area:

- |   |                            |
|---|----------------------------|
| 3.1 全彩发光字/Full color luminous words                                 | 3.2 全彩模组/Full color module |
| 3.3 点光源/Point light source  | 3.4 全彩灯条/Full Light Bar    |
| 3.5 灯条屏/Lamp screen   | 3.6 彩幕屏/Color screen       |
| 3.7 圣诞装饰等多场景产品/Christmas decorations and other multi-scene products |                            |

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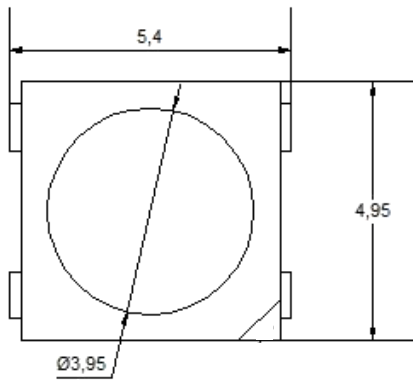
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## 4、外观描述 /Appearance description:

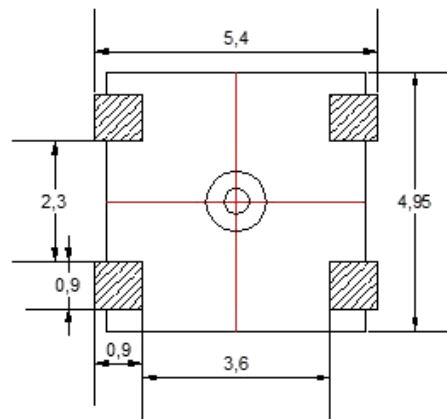
型号 Type	发光颜色 Luminescent colors	表面胶体颜色 Surface colloid color
CY-C5050WS2812B-T1	全彩 All color	半透明雾状胶体 Translucent aerosolized colloid

## 5、封装尺寸/Package Size:

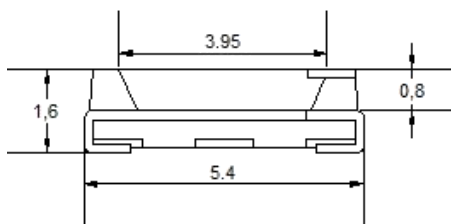
正面图



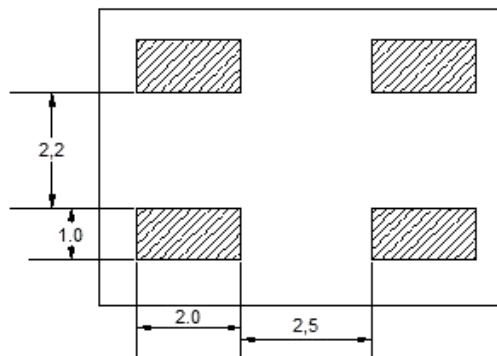
背面图



侧面图



建议焊盘图



### 注解/Notes:

1. 所有尺寸以毫米为单位/All dimensions are in millimeters.
2. 未标注公差为: X.X ±0.10mm ,X.XX±0.05mm/Unmarked tolerances: X.X ± 0.10 mm, X.XX ± 0.05

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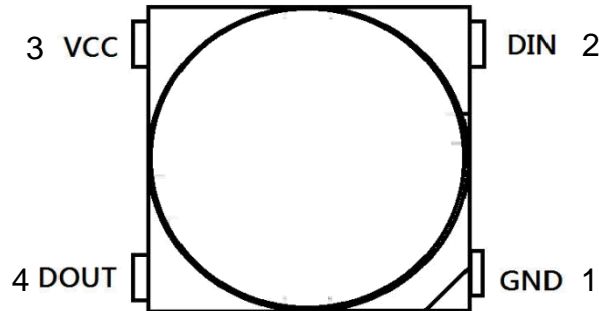
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## 6、脚位图 (4PIN) /Foot map (4PIN):



### 脚位说明/Foot description:

序号 Serial number	符号 Symbol	功能描述 Functional description
1	GND/VSS	信号地及电源地/Signal ground and power supply ground
2	DIN	显示数据输入 (800K) /Display data input (800K)
3	VCC/VDD	内部 IC 电源正及 RGB 正极/INTERNAL IC power supply and RGB positive pole
4	DOUT	显示数据级联输出 (800K) /Display data cascade output (800K)

## 7、最大额定值 (如无特殊说明, $T_A = 25^\circ\text{C}$ , $V_{SS} = 0\text{V}$ ) /Maximum Rating: ( $T_A = 25^\circ\text{C}$ , $V_{SS} = 0\text{V}$ , if not specified):

参数 Parameter	符号 Symbol	范围 Range	单位 Units
逻辑电源电压 Logic supply voltage	Vdd	6.5	V
输出端口耐压 output port voltage withstand	Vout	24	V
逻辑输入电压 Logic input voltage	Vi	-0.5 ~ Vdd + 0.5	V
工作温度 Operating Temperature Range	Topt	-40 ~ +85	°C
储存温度 Operating Temperature Range	Tstg	-55 ~ +150	°C
湿气敏感等级 Moisture sensitive level	MSL	5a	-

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## 8、推荐工作范围 (如无特殊说明, $T_a = -40 \sim +85 \text{ }^\circ\text{C}$ , $V_{SS} = 0\text{V}$ ) / Recommended scope of work ( $T_a = -40 \sim +85 \text{ }^\circ\text{C}$ , $V_{SS} = 0\text{V}$ without special description):

参数 Parameter	符号 Symbol	最小 Min.	典型 Typ.	最大 Max.	单位 Units
逻辑电源电压 Logic supply voltage	Vdd	-	5.2	6.5	V
高电平输入电压 High level input voltage	Vih	0.7Vdd	-	Vdd	V
低电平输入电压 Low level input voltage	Vil	0	-	0.3Vdd	V
输出端口耐压 Output voltage withstand	Vout	24			V

## 9、电气参数 (如无特殊说明, $T_a = -40 \sim +85 \text{ }^\circ\text{C}$ , $V_{SS} = 0\text{V}$ , $V_{DD} = 4.5 \sim 5.5\text{V}$ ) / Electrical parameters: (Without special instructions, $T_a = -40 \sim +85 \text{ }^\circ\text{C}$ , $V_{SS} = 0\text{V}$ , $V_{DD} = 4.5 \sim 5.5\text{V}$ ):

参数 Parameter	符号 Symbol	最小 Min.	典型 Typ.	最大 Max.	单位 Units	测试条件 Conditions
低电平输出电流 Low level output current	Iout	-	12	-	mA	R, G, B
低电平输出电流 Low level output current	Ido	10	-	-	mA	$V_o = 0.4\text{V}$ , Dout
输入电流/Input Current	Ii	-	-	$\pm 1$	$\mu\text{A}$	
输出管脚电流/Output Pin current	Isink		12		mA	
高电平输入电压/High level input voltage	Vih	0.7Vdd	-		V	D <sub>IN</sub> , SET
低电平输入电压/Low level input voltage	Vil	-	-	0.3Vdd	V	D <sub>IN</sub> , SET
滞后电压/Lag Voltage	Vh	-	0.35	-	V	D <sub>IN</sub> , SET
电流偏移量 (通道间) Current offset (between channels)	dIout		$\pm 1.5$	$\pm 3.0$	%	Vds=1V, Iout=12mA
电流偏移量 (芯片间) Current offset (between chips)	dIout		$\pm 3.0$	$\pm 5.0$	%	Vds=1V, Iout=12mA
电流偏移量 VS-Vds/Current offset VS-Vds	%dVds		$\pm 0.1$	$\pm 0.5$	%/V	1V<Vds<3V
电流偏移量 VS-Vdd/Current offset VS-Vdd	%dVds		$\pm 1.0$	$\pm 2.0$	%/V	4.5V<Vdd<5.5V
动态电流损耗/Dynamic current loss	IDDdyn	无负载 No load			1	mA
消耗功率/Consumed power	PD	Ta=25°C			250	mW
热阻值/Thermal resistance	Rth(j-a)		80		190	°C/W

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## 10、开关特性（如无特殊说明， $T_a = -40 \sim +85^\circ\text{C}$ ， $V_{SS} = 0\text{V}$ ， $V_{DD} = 4.5 \sim 5.5\text{V}$ ）/Switching characteristics: (Without special instructions, $T_a = -40 \sim +85^\circ\text{C}$ , $V_{SS} = 0\text{V}$ , $V_{DD} = 4.5 \sim 5.5\text{V}$ ):

参数 Parameter	符号 Symbol	最小 Min.	典型 Typ.	最大 Max.	单位 Units	测试条件 Conditions
振荡频率 Oscillation frequency	FOSC1	-	800	-	KHz	$V_{DD} = 5\text{V}$
	FOSC2	-	10	-	MHz	$V_{DD} = 5\text{V}$
传输延迟时间 Transmission Delay Time	Tflz	-	-	300	ns	$C_1 = 15\text{pF}$ , $D_{IN} \rightarrow D_{OUT}$ , $R_1 = 10\text{k}\Omega$
下降时间 Descent time	Tthz	-	-	120	$\mu\text{s}$	$C_1 = 300\text{pF}$ , OUTR/OUTG/OUTB
数据传输率 Data transfer rate	Fd	800	-	-	Kbps	占空比 50% 50% duty cycle
输入电容 Input capacitance	Ci	-	-	15	pF	-

## 11、内置 LED 参数/Built-in LED parameters:

发光颜色 Luminous color	主波长 (nm) Main wavelength (nm)	发光强度 (mcd) Luminous Intensity (mcd)	工作电流 (mA) Operating Current (mA)	工作电压 (V) Operating Voltage (V)
R	620-630	300-1000	20	1.8-2.4
G	515-530	1500-4000	20	2.8-3.4
B	460-475	120-600	20	2.8-3.4

## 12、功能说明/Description of functions:

5050 内封 IC 灯珠采用单线通讯方式，采用归零码的方式发送信号。芯片在上电复位以后，接收 DIN 端打来的数据，接收够 24bit 后，DO 端口开始转发数据，供下一个芯片提供输入数据。在转发之前，DO 口一直拉低。此时灯珠将不接收新的数据，内置 RGB 芯片根据接收到的 24bit 数据后产生的不同占空比信号，展现不同亮度。如果 DIN 端输入信号为 RESET 信号，芯片将接收到的数据送显示，芯片将在该信号结束后重新接收新的数据，在接收完开始的 24bit 数据后，通过 DO 口转发数据，灯珠在没有接收到 RESET 码前，RGB 亮度保持不变，当接收到 100us 以上低电平 RESET 码后，灯珠内部 RGB 芯片将根据刚才接收到的 24bit 数据后产生的不同占空比信号，展现不同亮度。

/5050 IC lamp beads sealed in a single line of communication, the use of zero-return code to send signals. After the reset, the chip receives the data from Din. After receiving 24 bits, the DO begins to transmit the data for the next chip to provide the input data. The DO was pulled down until it was retweeted. At this point will not receive new data, BUILT-IN RGB chip according to the received 24 bit data generated by the duty cycle signal, display different brightness. If the DIN input signal is a RESET signal, the chip will send the received data to display, the chip will

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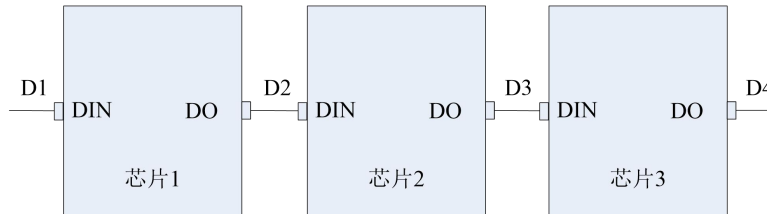
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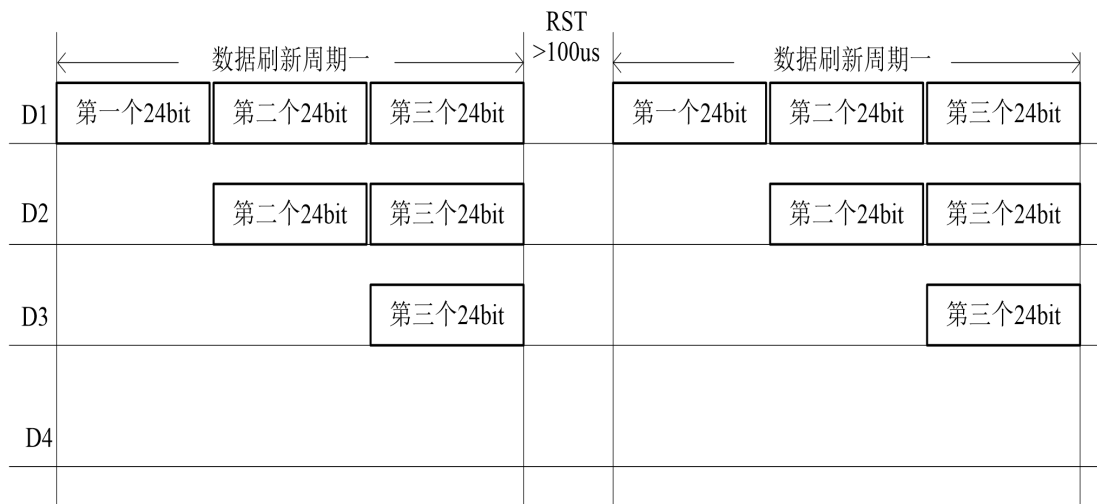
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re-receive the new data after the end of the signal, after receiving the initial 24 bit data, the data will be transmitted through the DO port, before receiving the Reset Code, the RGB brightness remains the same. After receiving the low level RESET code above 100us, the RGB chip inside the lamp will display different brightness according to the different duty cycle signal produced after receiving the 24bit data just now.

## 1) 芯片级联方法/Chip cascading method:



## 2) 数据传输/Data transmission:



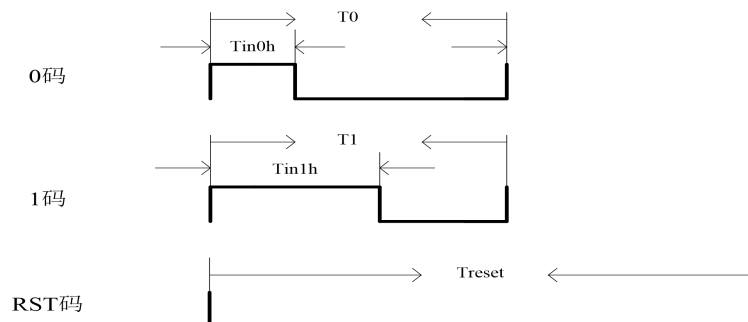
注：其中 D1 为 MCU 端发送的数据，D2、D3、D4 为级联电路自动整形转发的数据。/Note: Where D1 is the data sent by the MCU, D2, D3, and D4 are the data automatically transferred by the cascading circuit.

## 3) 24bit 数据结构/24 bit data structure:



注：高位先发，按照 GRB 的顺序发送数据/Note: Higher-level starts, sending data in GRB order.

## 4) 时序波形图/Sequential wave map:





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## 5) 信号传输定义/Signal Transmission Definition:

参数 Parameter	符号 Symbol	最小值 MIN.	典型值 Typ.	最大 Max.	单位 Units
输入 0 码高电平时间 Enter a 0-yard high-level time	Tin0h	0.20	0.28	0.35	us
输入 1 码高电平时间 Enter 1 yard high level time	Tin1h	0.65	0.9	1.0	us
输入 0 码低电平时间 Enter the zero yard low level time	T0L	1.55	1.72	30	us
输入 1 码低电平时间 Enter 1 yard low level time	T1L	1.10	1.10	30	us
0 码/1 码周期 Zero-yard-per-yard period	T0/T1	1.75	-	35	us
RESET 码低电平时间 Reset Code Low level time	Treset	100	150	-	us

注/Note: a: 5050RGB 主要根据高电平时间判断“0”码和“1”码。高电平时间介于 200ns~410ns, IC 判断为“0”码, 高电平时间介于 640ns~1000ns, 判断为“1”码。“0”码和“1”码的低电平代表此码结束, 准备接收下一数据码。/a: 5050RGB is mainly based on high-voltage flat time to determine “0” code and “1” code. The high power level time is between 200ns ~ 410ns, IC is judged to be “0” code, high power level time is between 640ns ~ 1000ns, and it is judged to be “1” code. The low levels of the “0” code and the “1” code represent the end of this code and are ready to receive the next data code.

b: 低电平复位时间最小为 100us, 为了留有裕度, 一帧数据传输过程中(包括 24bit 和 24bit 之间、bit 和 bit 之间)不要中断超过 35us, 否则可能会被 IC 认为是 RESET。中断时间在 35us 之内, 控制器可以进行正常数据传输等其他操作。/b: The low flat reset time is a minimum of 100us. In order to leave a margin, do not interrupt more than 35us during a frame data transmission(including between 24bit and 24bit, between bit and bit), otherwise it may be considered by IC as RESET. The interrupt time is within 35us, and the controller can perform other operations such as normal data transmission.

## 6) 控制器时序建议值/Recommended Controller Timing:

名称 Name	描述 Description	典型值 Typ.	建议设定值 Recommended setting
T0H	0 码, 高电平时间/Zero yards, high-level time	0.28us	0.28us
T1H	1 码, 高电平时间/One Yard, high-level time	0.9us	0.9us
T0L	0 码, 低电平时间/Zero yards, low-level time	>1.72μs	1.72μs
T1L	1 码, 低电平时间/One Yard, low level time	>1.1us	1.1μs
T	“0”码或“1”码周期/Zero or one yard period	>2.0us	--
Treset	Reset 码, 低电平时间/Reset Code, low-level time	>100us	150us

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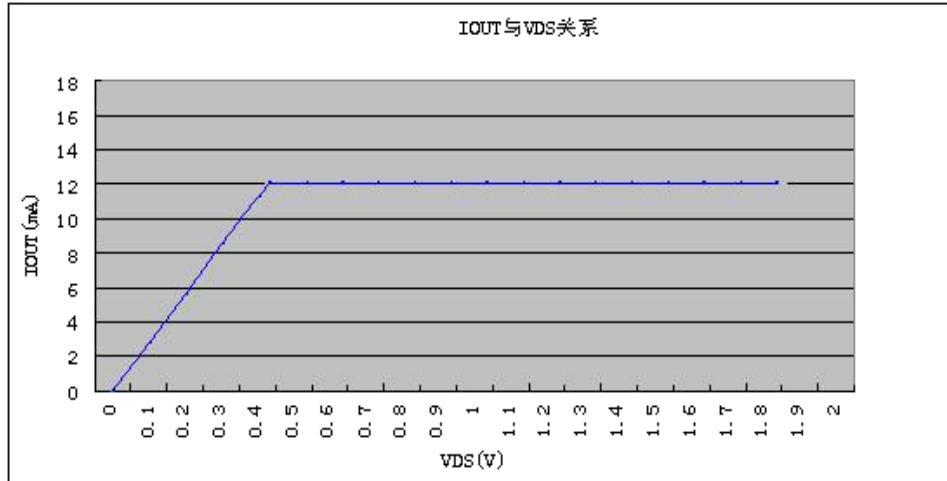
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## 13、恒流曲线/Constant-current curve:

内置 IC 恒流特性优异，通道间甚至芯片间的电流差异极小。/The built-in IC has excellent constant current characteristics, and the current difference between channels and even between chips is very small.

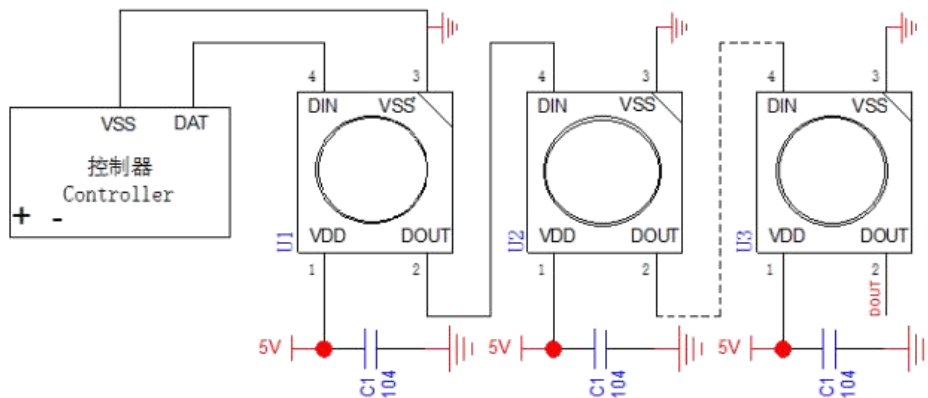
(1): 通道间的最大电流误差小于  $\pm 1.5\%$ ，而芯片间的最大电流误差小于  $\pm 3\%$ 。The maximum current error between channels is less than  $\pm 1.5\%$ , and the maximum current error between chips is less than  $\pm 3\%$ .

(2): 当负载端电压发生变化时，输出电流不受影响，如下图所示/When the voltage at the load end changes, the output current is not affected, as shown in the figure below:



## 14、应用线路图/Application Route Diagram:

电源电压 5V (如下图示) /Power supply voltage 5V (as shown)



产品应用中驱控灯珠级联数量及控制器参数配置、驱动电源品质均有较大差异，故请在批量使用产品前，客户方务必自行验证产品兼容性，我司不承诺满足客户所有应用需求。/In the application of the product, there are big differences in the number of the cascade of the driving lights, the configuration of the controller parameters and the quality of the driving power, we are not committed to meeting all the application requirements of our customers.

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## 15、使用注意事项/Precautions:

### (一)、关于产品/About the product

1、本 LED 器件的核心组件是 LED 芯片，其主要材料为半导体化合物。故在 LED 器件使用时应特别注意：正向工作电流（IF）、正向工作电压（VF）、允许功耗（Pm）、工作环境（°C/RH）、光色波长（WL）等光 电性参数，详情请参阅敝司提供的《产品规格书》所述相关技术性条款。/The core component of the LED device is LED chip, the main material of which is semiconductor compound. Therefore, special attention should be paid to such optical and electrical parameters as forward operating current (IF), forward operating voltage (VF), permissible power consumption (Pm), working environment (°C/RH), light color wavelength (WL), etc., for details, please refer to the relevant technical terms and conditions as stated in our product specification.

2、本 LED 器件采用之引线架由注塑工艺成型，故塑件受外力即有可能发生形变导致拉裂内部邦线并导致开路缺色，故在产品设计及生产制程中务必评估并避免因 PCB 基板形变造成 LED 灯珠受损，否则建议更改灯珠方案。/The lead frame of the LED device is molded by injection molding process. Therefore, the plastic part may be deformed by external forces, which may cause the inner wire to be pulled apart and the open circuit to be short of color, therefore, in the product design and production process must be evaluated and avoid damage caused by PCB substrate deformation LED lights, otherwise, it is recommended to change the scheme of lights.

3、在高温条件下，衰减会加速，本身应力也会增大，若长期处于高温环境下，极容易出现失效，对于高密度排列使用的情况，建议在使用过程中灯面温度不超过 55°C，灯脚温度不超过 75°C。/Under the high temperature condition, the attenuation will accelerate, and the stress will also increase. If the lamp is under the high temperature environment for a long time, it is very easy to fail. For the case of high density arrangement, it is suggested that the surface temperature of the lamp should not exceed 55 °C during the use, lamp Foot temperature not exceeding 75 °C.

### (二)、关于湿敏性/On humidity sensitivity

本 LED 器件属湿敏性元器件，空气中的湿气通过扩散渗透到产品中，当经过高温回流焊时，在高温状态下，渗入其中的湿气快速膨胀产生足够的蒸汽压力损伤或毁坏 LED 元件，从而出现材料内胶裂、分层或金线损失等可靠性失效问题。尽管产品在出厂前对吸湿和防潮进行了严格的除湿和防护措施，但仍需在产品使用时特别注意：/The LED device is a humidity-sensitive component. The moisture in the air can permeate into the product through diffusion. When the LED is rewelded at high temperature, the moisture can rapidly expand and cause enough steam pressure damage or damage to the LED device, the reliability failure problems such as internal GEL crack, delamination or gold line loss appear. Although the products are strictly dehumidified and protected against moisture before they leave the factory, special attention should be paid to the use of the products:

1、推荐储存环境：温度：5° C - 30° C；湿度：相对湿度 60%以下；/Recommended Storage Environment: Temperature: 5 ° c-30 ° C; Humidity: relative humidity below 60%;

2、生产前确认产品真空包装完好且在封口日期起 15 天内，产品拆封后，LED 在温度≤30°C，相对湿度≤60%RH 的条件下，并请贴片上机时边上料边开袋，且确保开袋产品在 4 小时内完成贴片固焊作业！若没有使用完的产品需以 65 ± 5°C/24H 除潮后密封，建议放入干燥柜中存放；/Before production, make sure the vacuum packaging of the product is in good condition and within 15 days after the sealing date. After the product is unsealed, the LED should be opened at the condition of temperature ≤30 °C and relative humidity ≤60% rh, and ensure that the open bag products in 4 hours to complete the patch bonding operation! If the unused product needs to be sealed after dehumidification at 65 ± 5 °c/24 H, it is recommended to store in a

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drying cabinet;

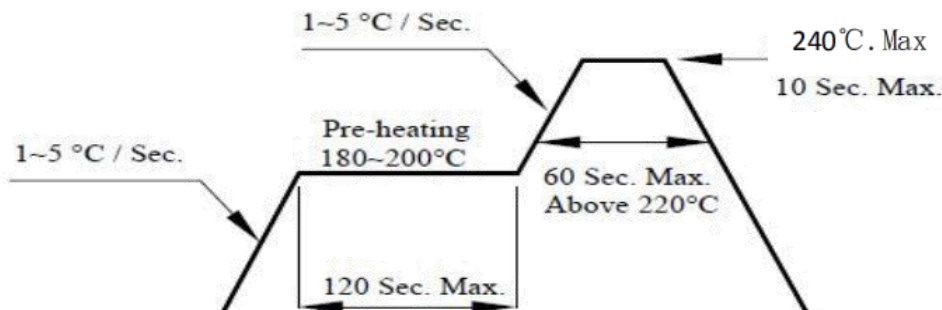
3、生产前检查产品真空包装是否漏气，如漏气请停用！并标识区分后进行低温除湿（低温除湿条件：即去除铝箔袋后将料盘放置在柜式干燥箱内进行温度  $65 \pm 5^\circ\text{C}$ 、相对湿度  $\leq 10\%RH$ 、烘烤时间  $\geq 24$  小时的除湿作业，如属热风烤箱则建议除湿时关闭烤箱进风口开关，关键确保箱内相对湿度  $\leq 10\%RH$ ；且回温过程必须在干燥的环境下进行！建议产品除湿后在 4 个小时内完成贴片固焊作业！）或联系专属客服人员并返厂处理。 /Before production check whether the product vacuum packaging leak, such as leak please stop using! Low temperature dehumidification (low temperature dehumidification condition: After removing the aluminum foil bags, put the tray in the cabinet drying box to do the dehumidification operation with the temperature  $65 \pm 5^\circ\text{C}$ , relative humidity  $\leq 10\%rh$ , and baking time  $\leq 24$  hours. If the oven is a hot air oven, it is suggested to turn off the oven air inlet switch when dehumidifying. The key is to ensure the relative humidity  $\leq 10\%RH$  in the oven! It is recommended that after dehumidifying the product, the bonding operation should be completed within 4 hours!) Or contact customer service personnel and return to factory for processing.

### （三）、关于贴片加工/About SMT

1、本 LED 器件容易受到机械外力的破坏，在表面上施加压力将会影响发光二极管的可靠性。在这样的情况下，装配使用产品时必须遵守相应的处理措施，避免任何的压力施加给本 LED 器件的任何部分，所以在使用时请采用气动吸嘴，否则会导致发光二极管损坏和可靠性降低影响其寿命。并检查贴片机设备的吸嘴装置与产品匹配性，以不伤及产品胶体为宜； /The LED device is vulnerable to mechanical forces, and applying pressure to the surface will affect the reliability of the light-emitting diode. In such cases, the assembly of the product must comply with the corresponding treatment measures to avoid any pressure applied to any part of this LED device, so in use, please use pneumatic nozzle, otherwise, it will lead to light-emitting diode damage and reduce the reliability of its life, and check the SMT equipment suction nozzle device and product compatibility, not to hurt the product Gel is appropriate.

2、当手动焊接时，建议采用 20W 的防静电烙铁，焊头的温度必须控制在  $360^\circ\text{C}$  以下/3 秒，焊接次数为 1 次。 /When manual welding, it is recommended to use 20W antistatic soldering iron. The temperature of welding head should be controlled below  $360^\circ\text{C}/3$  seconds and the welding times should be 1.

3、本 LED 器件属于潮湿敏感性元件，建议作业前检查回流焊设备的峰值温度/时间是否控制在  $240+0\sim-5^\circ\text{C}/\leq 10$  秒，无铅锡膏的温度曲线建议： /The LED is a humidity sensitive element. It is recommended that the peak temperature/time of the reflow equipment be controlled at  $240 + 0-5^\circ\text{C}/\leq 10$  seconds before operation. The temperature curve of lead-free solder paste is recommended:



4、回流焊接次数不可超过 1 次，建议检查终端产品是否需要经历二次回流焊工艺，二次回流焊工艺具有一定品质风险性，如需请自行评估并尽量缩短二次回流焊间隔时间（建议不超过 4 小时）。 /The number of reflow soldering shall not exceed 1 time. It is recommended to check whether the terminal

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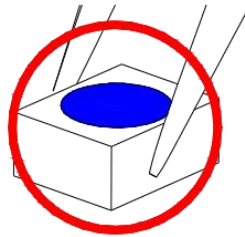
products need to go through reflow soldering process, which has certain quality risk, if necessary, please self-assessment and minimize the reflow interval time (not more than 4 hours is recommended) .

5、焊接期间，加热时不要在本 LED 器件上添加任何压力。/During welding, do not add any pressure to the LED when heating.

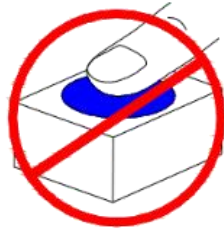
6、焊接后，正常回温至 40℃ 以下后才可过电流。/After welding, the normal return temperature below 40 °C can be over-current.

7、使用操作示意图：/USE THE ACTION DIAGRAM:

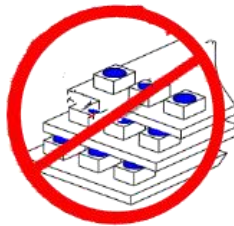
7.1、使用镊子或合适的工具，沿侧表面夹取元件。/Using tweezers or a suitable tool, clamp the element along the side surface.



7.2、不要接触有机硅的表面，它可能会破坏 LED 器件的内部电路。/Do not touch the silicone surface, it may destroy the internal circuit of the LED device.

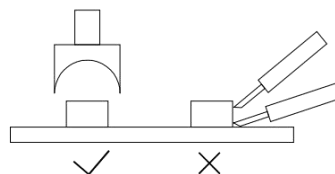


7.3、不要将焊接好的发光二极管堆叠放置，会导致发光二极管划伤及胶体受损造成死灯。/Do not stack the welded light-emitting diode. This can cause light-emitting diode scratches, Gel damage and a dead light.



## (四)、关于修复/About the restoration

当修复发光二极管时，应事先确认发光二极管是否会被破坏，修复过程中应避免接触胶体表面，双焊头烙铁应使用如下图的方式作业。/When repairing the light-emitting Diode, it should be confirmed in advance whether the light-emitting diode will be damaged or not. The repair process should avoid touching the COLLOID surface. The double welding head soldering iron should be used in the way shown below.





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## （五）、关于清洗/About cleaning

在焊接后推荐使用纯酒精清洗，清洗擦拭或浸渍不要超过 1 分钟。使用其它类似溶剂清洗前，请确保溶剂不会对本 LED 器件封装造成损伤。/Pure alcohol cleaning is recommended after welding. Cleaning, wiping or maceration should not exceed 1 minute. Before cleaning with other similar solvents, please ensure that the solvent will not cause damage to the LED packaging.

## （六）、关于灌封/About potting

1、使用硅酮胶（玻璃胶）灌封时推荐采用中性、醇型类灌封胶。 /It is recommended to use neutral and alcohol type filling sealant when silicone (glass sealant) is used.

2、灌封胶若使用脱脲型中性灌封胶，请确保灌封胶固化过程中的通风良好，在未完成固化过程中不可进行密封组装本 LED 器件，这样会造成镀银层氧化及发光颜色变淡。/If using deoxime neutral filling sealant, please ensure that the filling sealant curing process ventilation is good, in the unfinished curing process can not be sealed assembly of this LED device, which will cause silver coating oxidation and light color.

3、禁止使用醋酸型（酸性）硅酮胶进行灌封。 /The use of acetic acid type (acidic) Silicone Gel is prohibited for potting.

4、使用正常灌封胶时建议进行少量灌封试验，常温点亮测试 168H 确认无异常后再批量作业。 /It is recommended to do a small amount of pouring test when using normal pouring sealant and light up at room temperature for 168H before batch operation.

5、更改任何一种灌封材料时，请先作试样确认是否对我司产品造成侵蚀反应。将灌封材料取 5-10g 和本 LED 器件 10-20pcs 于 100ml 的器皿内密封放置 168H 后确认产品是否有异常。 /When changing any kind of filling material, please make sample first to confirm whether it will cause corrosion reaction to our products. 5-10g of the filling material and 10-20pcs of the LED device were sealed in 100ML containers for 168H to confirm whether the product was abnormal.

## （七）、防护措施/Protective measures

1、LED 器件封装胶水采用的是硅树脂系原材，终端产品如需户外使用需对器件做二次防护措施并请特别注意； /Led packaging glue is silicone raw materials, terminal products such as outdoor use of the device to do secondary protection measures and please pay special attention;

2、建议检查各个工艺流程环节应规避产品有堆叠及不规则棱角物伤及产品胶体； /It is suggested that the inspection of each process should avoid product stacking and irregular Arris and product colloid;

3、建议检查各个工艺流程环节应规避产品与硫、卤、酸、醇、碱、酮类强氧化物、塑化剂等腐蚀性物质接触； /It is suggested that the contact between the products and corrosive substances such as sulfur, halogen, acid, alcohol, Alkali, ketone strong oxide and plasticizer should be avoided

4、建议检查终端产品是否需要封盖、灌胶、裸板高温挤出、超声等二次封装工艺，如需请评估可能伤及 LED 器件的风险；是否需要刷胶、涂油、抹漆等二次涂装工艺，如需请评估可能导致器件胶体表面凹凸、污垢等因素影响发光、导热的风险。 /It is recommended to check whether the end product needs secondary packaging processes such as sealing, pouring, high temperature extrusion of bare board, ultrasonic and so on. If so, please assess the risk of possible damage to LED devices, if you need to assess the possible causes of device COLLOIDAL surface bump, dirt and other factors affecting the light, heat conduction risk.



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## （八）、驱动方式/Driving Mode

LED 产品为单向导通性，使用安装前请确认产品极性，若反向安装，不能正常点亮，且在施加电压时容易造成 LED 芯片损伤或失效； /Led products for one-way conduction, please confirm the product polarity before installation, if the reverse installation, can not normally light, and in the application of voltage LED chip damage or failure;

## （九）、静电防护/Electrostatic protection

对于整个工序（生产, 测试、包装等）所有与 LED 直接接触的员工都要做好防止和消除静电措施，主要有： /For the entire process (production, testing, packaging, etc.) all employees in direct contact with the LED to prevent and eliminate static measures, mainly:

1、车间铺设防静电地板并做好接地，工作台采用防静电工作台，带电产品接触低阻值的金属表面时，由于急放电引发产品故障的可能性是很高的，故要求工作台及与产品相接触之处使用表面电阻为  $10^6 - 10^9 \Omega$  的桌垫。 /The workshop lays the anti-static floor and makes the ground well, the worktable uses the anti-static worktable, when the live product contacts the low resistance value metal surface, because the sudden discharge causes the product breakdown the possibility is very high, table Mats with a surface resistance of  $10^6 - 10^9 \Omega$  are required for the table and for contact with the product.

2、生产机台如：锡炉、回流焊、SMT 设备、电烙铁，以及检测设备均需接地良好，接地交流阻抗小于  $1.0 \Omega$ 。在容易产生静电的环境与设备上，还必须安装离子风扇、作业过程中，操作员穿防静电服、带防静电手环、手套等，取放时尽可能接触产品的绝缘部分。 /Production equipment such as: Tin Furnace, reflow soldering, SMT equipment, electric soldering iron, and testing equipment should be well grounded, grounded AC impedance less than  $1.0 \Omega$ . In the environment and equipment prone to static electricity, it is necessary to install an ion fan, during the operation, the operator wearing anti-static clothing, with anti-static bracelet, gloves, etc. .

3、盛装 LED 使用防静电元件盒，包装则采用防静电材料。 /Filled with LED anti-static components box, the use of anti-static packaging materials.

4、请保持环境湿度在 60%RH 以下，以免空气过于干燥产生静电。 /Please keep the humidity below 60% rh to prevent the air from being too dry to generate static electricity.

5、静电接地需与电源零线、防雷地线分开，接地措施应完全防止静电产生，必须用粗的铜线引入泥土内，在铜线末端系上大铁块，埋入地表 1 米以下，各接地线均需与主线连接在一起。 /The static grounding should be separated from the power supply zero wire and the lightning protection ground wire. The grounding measure should prevent static electricity completely. The thick copper wire must be introduced into the soil, each grounding wire must be connected with the main wire

## （十）、其他 /Othes

1. 本规格所描述的 LED 定义应用在普通的电子设备范围（例如办公设备、通讯设备等等）。如果有更为严苛的信赖度要求，特别是当元件失效或故障时可能会直接危害到生命和健康时（如航天、运输、交通、医疗器械、安全保护等等），请事先知会敝司业务人员； /The LED definitions described in this specification apply to ordinary electronic devices (such as office equipment, communication equipment, etc.) . If there are more stringent reliability requirements, especially when component failure or failure may directly endanger life and health (such as aerospace, transportation, transportation, medical devices, safety protection, etc.) , please inform our sales staff in advance;

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2. 高亮度 LED 产品点亮时可能会对人眼造成伤害，应避免从正上方直视； /High-brightness LED products lighting may cause harm to the human eye, should avoid looking directly from the top;

3. 出于持续改善的目的，产品外观和参数规格可能会在没有预先通知的情况下作改良性变化。 /For the purpose of continuous improvement, the appearance and specifications of the product may be modified without prior notice.

## 注/Note:

1. 为确保以上注意事项有效进行！建议客户加强各工艺流程环节中的首检及周期性巡检！以最大程度预防异常发生或减少因异常造成的损失！ /In order to ensure the above matters needing attention to carry on effectively! We suggest customers to strengthen the process of the first inspection and periodic inspection! To maximize the prevention of abnormal occurrence or reduce the losses caused by abnormal!

2. 如需更加详细产品规格信息请联系销售代表，谢谢！ /For more detailed product specifications, please contact the sales representative, thank you!