

SPECIFICATION FOR APPROVAL

Customer Name :

Customer Item :

Part No. : PW-S235XDG-RG0

Product Description :

Draw Date :

1.Accessory: **Samples** **Samples Data**

2.Customer's Proposal : **Agree** **Disagree**

Reason :



Rev.	Draw by :	Checked by :	Approved by :
1.2.1	Steven Chen	Gray Huang	Caren
Customer Approve			

概 述 SUMMARY

產品名稱	【Product Name】:	RG0 全譜 Led 光源
產品尺寸	【Product Size】:	2.8*3.5*0.7mm
膠體顏色	【Surface Color】:	黃色 Yellow
晶片材質	【Dice Materia】:	InGaN
半功率角度	【Viewing Angle】:	120°
發光顏色	【Emission Color】:	白色 White
防水等級	【International Protection】:	IPX5*



特徵優勢 FEATURES AND BENEFITS

特種波譜,採用特殊螢光粉配方, 光譜連續滿足 RG0 測試要求;

Violet Ray Radiation,Special phosphor ratio,Continuous spectrum.Meet rg0 test requirements

符合能源之星認證要求;

Supports ENERGY STAR lumen maintenance certification requirements

低熱阻, 低電壓, 高亮度, 高光效, 高顯指;

Low thermal resistance , Low Voltage , Superior Lumens , High light efficiency , High CRI,

色溫顯指範圍齊全, 滿足不同色溫顯指需求;

Full range of CCTs and CRI configurations for design flexibilit

顏色一致性好, 按照麥克亞當分光分色, 色差小於 5, 最小色差 3

Good color consistency,According to McAdam spectroscopic color separation,SDCM<5

Minimum color tolerance is less than 3 step.

應用範圍 APPLICATIONS

商業照明 Commercial lighting

家居照明 Indoor lighting

健康照明 Healthy Lighting

燈飾照明 Decorative Lighting

植物照明 Plant lighting

主要光電特性 Typical Electrical & Optical Characteristics(T = 25°C)

項目 Items	測試條件 Test Condition	符號 Symbol	最小值 Min	平均值 Avg	最大值 Max	單位 Unit
正向電壓 Forward voltage	60mA	V_F	2.8	2.95	3.3	V
正向電流 Forward Current		I_f	---	60	150	mA
反向電流 Reverse Current	5V	I_R	---	---	1	μ A
半功率角度 View Angle	60mA	$2\theta_{1/2}$		120		Deg

最大限度性能參數 Absolute Maximum Rating(T = 25°C)

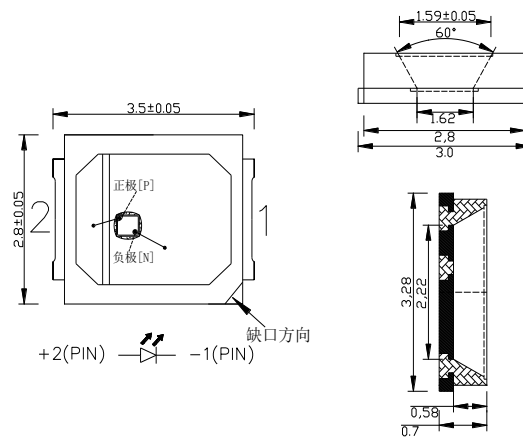
項目 Items	符號 Symbol	最大限度值 Absolute maximum Rating	單位 Unit
反向電壓 Inverse voltage	V_R	10	V
工作溫度 Operation Temperature	T_{opr}	-40 to + 100	°C
存儲溫度 Storage Temperature	T_{stg}	-40 to + 100	°C
結溫 Junction temperature	T_j	125	°C
Thermal resistance(J to S)	$R_{\theta J-S}$	18	°C/W
人體抗靜電級別 ESD Sensitivity	V	2000	V
焊接溫度 Soldering Temperature	T	250 (JEDEC 020D)	°C
容許回流焊次數 Allowable Reflow Cycles	Times	2	T

項目	符号	单位	结果
蓝光危害加权辐亮度	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	9
蓝光危害加权辐照度(小光源)	E_B	$W \cdot m^{-2}$	1.887e-002
阈值照度	E_{thr}	lx	31

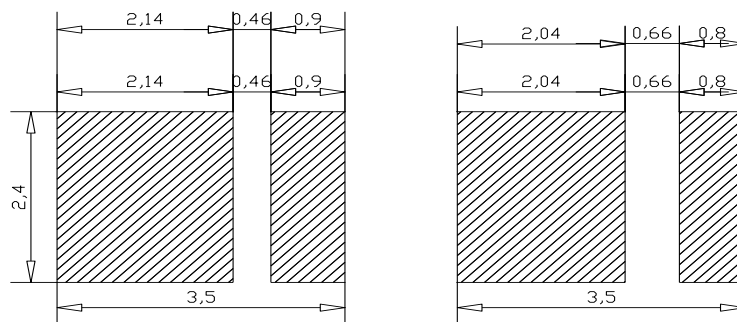
主要產品參數分類

色溫 CCT	流明 LumenFlux		60mA 光效 efficacy	流明 LumenFlux		150mA 光效 efficacy	色座標 xy	顯值 RA
	最小值 min	最大值 max		最小值 min	最大值 max			
2700K	14	16	95	50	60	80	0.4578,0.4101	90
3000K	14.5	16.5	95	50	68	80	0.4338,0.403	90
4100K	15	17	97	50	75	84	0.3818 , 0.3797	90
5000K	16	18	98	50	75	88	0.3447,0.3553	90
5700K	15.5	17.5	98	50	75	98	0.3287 , 0.3417	90
6500K	16	18	98	50	77	98	0.3123,0.3282	90

成品尺寸圖 (單位:mm) Dimension Drawing (Unit:mm)



焊盤尺寸圖 (單位:mm) Recommended solder pad design (Unit:mm)



焊盤圖

建議鋼網圖

分光分色標準 LED Classification standard

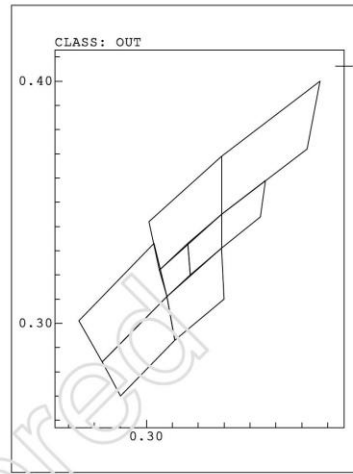
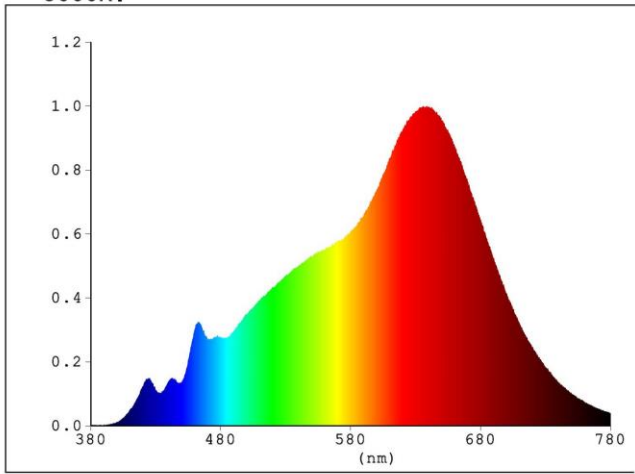
VF 分檔 bincode

Symbol	VF (V)		Symbol	VF (V)	
	MIN	MAX		MIN	MAX
V1	2.8	3.0	V11	2.8	2.9
			V12	2.9	3.0
V2	3.0	3.2	V21	3.0	3.1
			V22	3.1	3.2
V3	3.2	3.4	V31	3.2	3.3
			V32	3.3	3.4
V4	3.4	3.6	V41	3.4	3.5
			V42	3.5	3.6

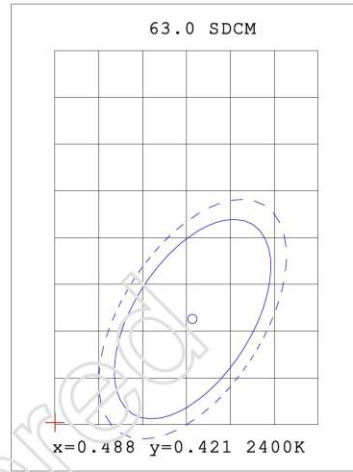
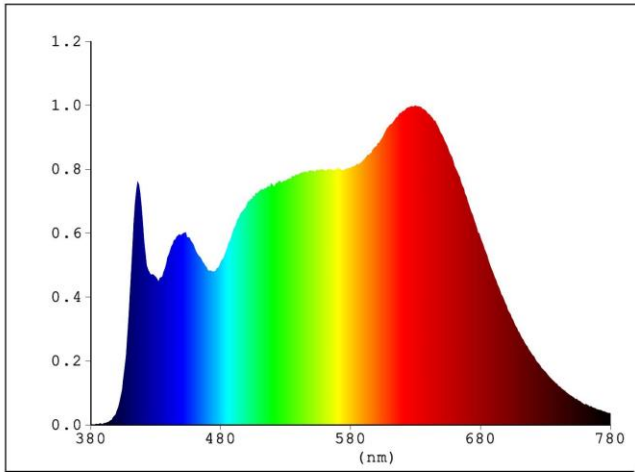
亮度分檔 bincode

Symbol	IV(mcd)		Flux(lm)	
	MIN	MAX	MIN	MAX
FL	6000	6650	18	20
FM	6650	7300	20	22
FN	7300	7950	22	24
FO	7950	8650	24	26
FP	8650	9300	26	28
FQ	9300	9950	28	30
FR	9950	11600	30	35
FS	11600	13250	35	40
FT	13250	14900	40	45
FU	14900	16600	45	50
FV	16600	18300	50	55
FW	18300	19800	55	60
FX	19800	21450	60	65
FY	21450	23100	65	70
FZ	23100	24750	70	75
F75	24750	26400	75	80

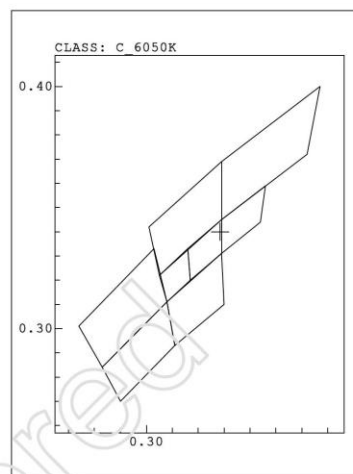
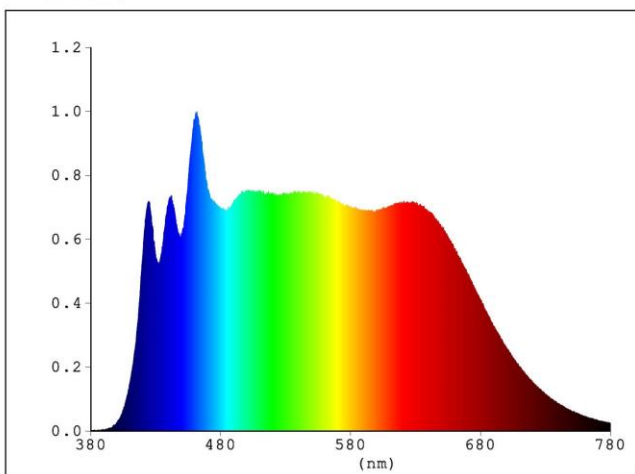
3000K:



4000K:



5700K:

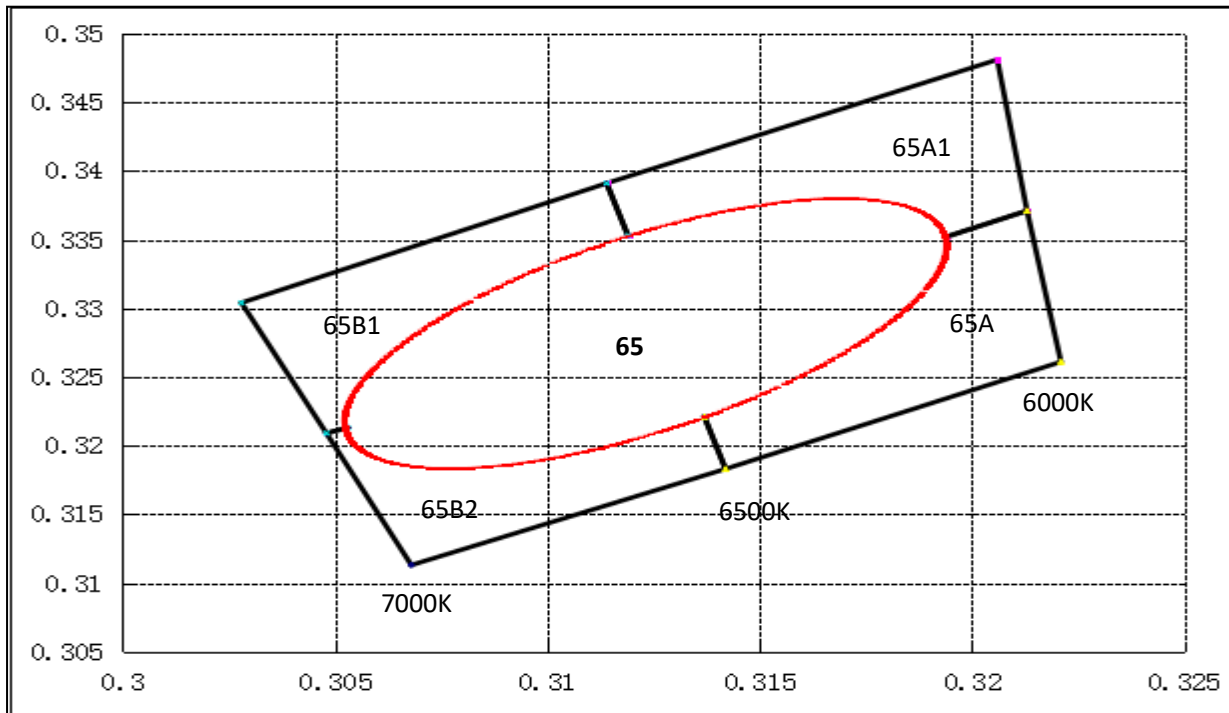


色區分光 Brcode

正白色溫分光 bin 代碼

色區代碼	65A1		65A2		65B1		65B2	
相關色溫	6500-7000K		6500-7000K		6000-6500K		6000-6500K	
第一點	0.3053	0.3213	0.3137	0.3221	0.3194	0.3352	0.3137	0.3221
第二點	0.3048	0.3209	0.3142	0.3183	0.3213	0.3371	0.3142	0.3183
第三點	0.3028	0.3304	0.3068	0.3113	0.3206	0.3481	0.3221	0.3261
第四點	0.3114	0.3391	0.3048	0.3209	0.3114	0.3391	0.3213	0.3371
第五點	0.3119	0.3353	0.3053	0.3213	0.3119	0.3353	0.3194	0.3352

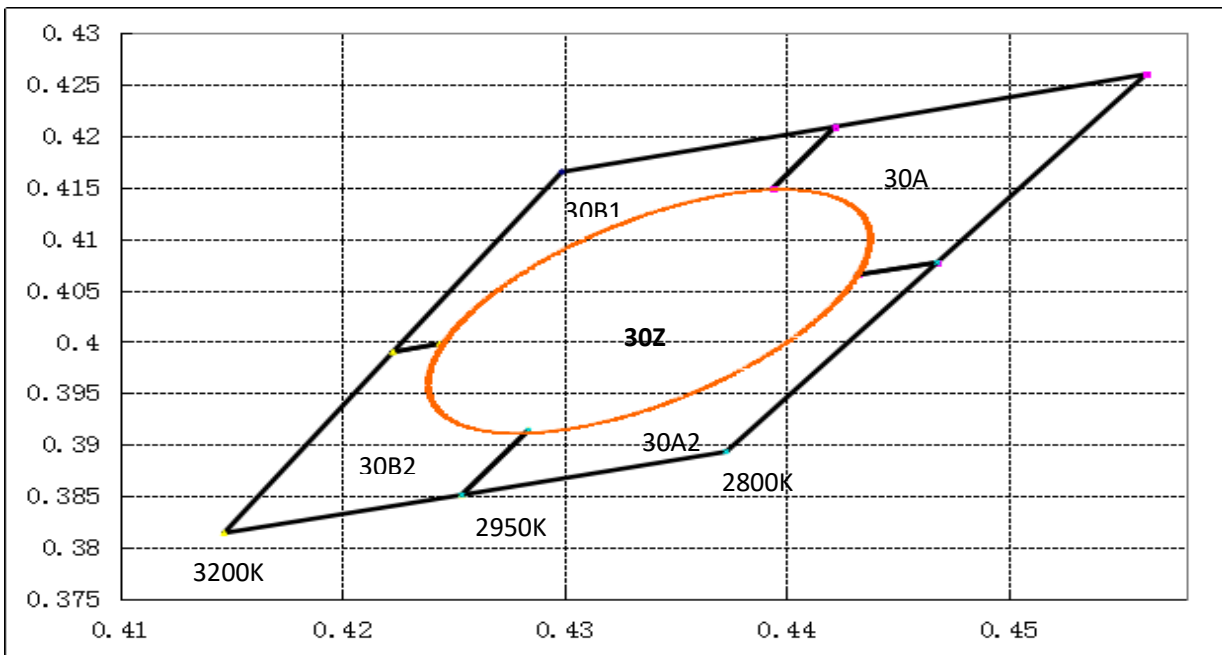
正白色溫分光色區圖



暖白色溫分光 bin 代碼

色區代碼	30A1		30A2		30B1		30B2	
相關色溫	3050-3200K		3050-3200K		2900-3050K		2900-3050K	
第一點	0.4244	0.3998	0.4394	0.4149	0.4284	0.3914	0.4432	0.4065
第二點	0.4223	0.399	0.4422	0.4209	0.4254	0.3851	0.4468	0.4077
第三點	0.4299	0.4165	0.4562	0.426	0.4147	0.3814	0.4373	0.3893
第四點	0.4422	0.4209	0.4468	0.4077	0.4223	0.399	0.4254	0.3851
第五點	0.4394	0.4149	0.4432	0.4065	0.4244	0.3998	0.4284	0.3914

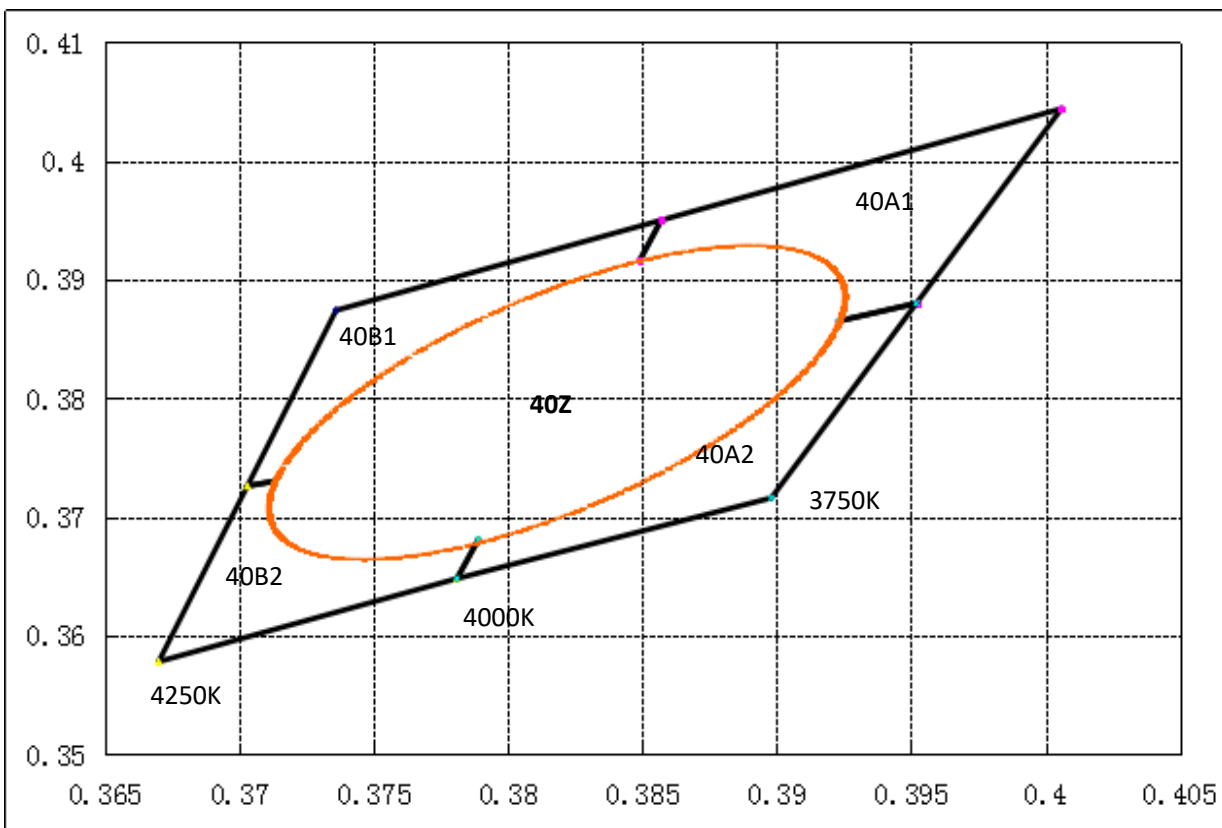
暖白色溫分光



自然白色溫分光 bin 代碼

色區代碼	40A1		40A2		40B1		40B2	
相關色溫	4000-4250K		4000-4250K		3750-4000K		3750-4000K	
第一點	0.3713	0.373	0.3849	0.3916	0.3789	0.3681	0.3923	0.3865
第二點	0.3703	0.3726	0.3857	0.395	0.3781	0.3648	0.3952	0.388
第三點	0.3736	0.3874	0.4006	0.4044	0.367	0.3578	0.3898	0.3716
第四點	0.3857	0.395	0.3952	0.388	0.3703	0.3726	0.3781	0.3648
第五點	0.3849	0.3916	0.3923	0.3865	0.3713	0.373	0.3789	0.3681

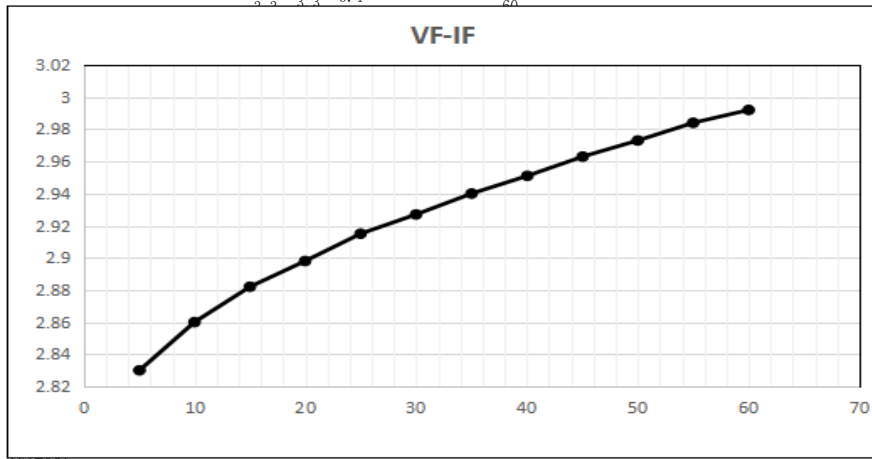
自然白色溫分光色區



VF (V)
3.5

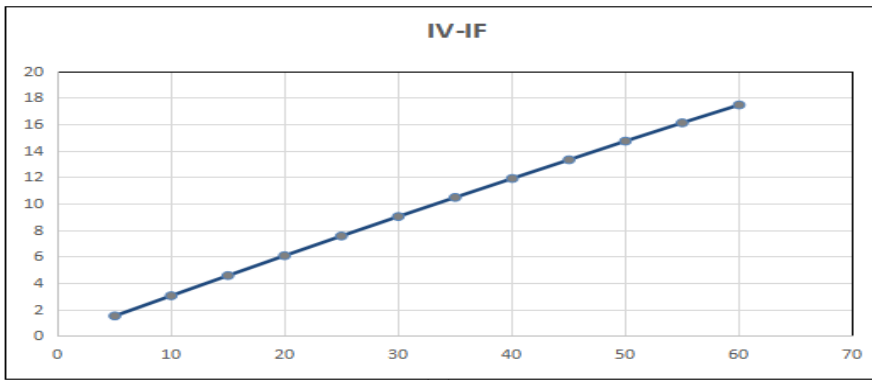
IF (mA)
70

Rthj-s=380°C/W



IV (mcd)
14000

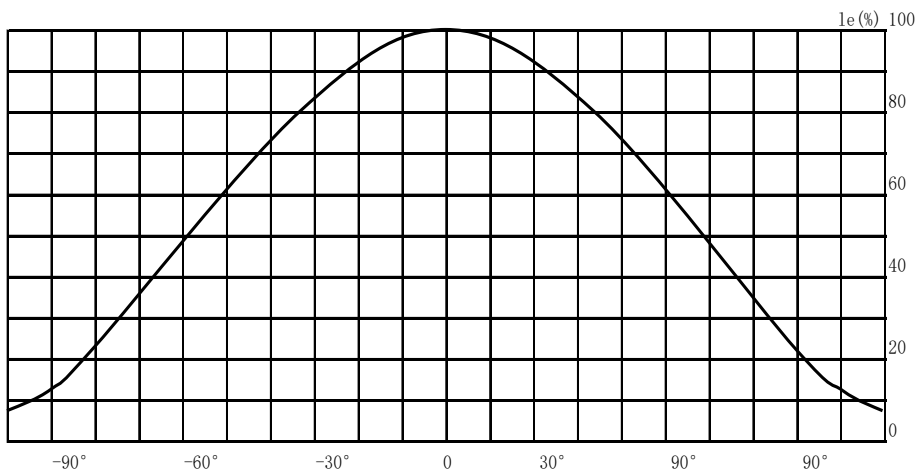
100%



光强的相对值与电流的关系曲线图

光强的相对值与波长的关系曲线图

半功率视角120度



角度曲线图

使用注意事項 **Application notes:**

1. 建議使用電流 Recommended current : 60mA

2. 防潮包裝 Moisture Proof Packing

- ◇ 為了防止在運輸和貯存過程中濕氣侵入到 SMD-LED, SMD-LED 必須要用防潮袋密封包裝.包裝時要在裡面放入乾燥劑。濕度卡上的濕度顯示可以提供包裝袋內的濕氣程度。濕度敏感等級:2A
- ◇ In order to prevent moisture absorption into SMT-LED during the transportation and storage, SMT-LED is packed in a moisture barrier bag. Desiccants and a humidity indicator are packed together with SMT-LED as the secondary protection. The indication of humidity indicator card provides the information of humidity within SMD packing.Humidity sensitive grade2A

3. 貯藏 Storage

- ◇ 有原包裝的未開封產品存儲的環境是：在溫度 <40°C 和濕度 <70% 環境下存儲時間不超過 12 個月，當存儲時間超過規定的 12 個月時則須重新烘烤。
- ◇ Shelf life in original sealed bag at storage condition of <40°C and <90%RH is 12 months. Baking is required whenever shelf life is expired.
- ◇ 開包前請檢查包裝袋是否有漏氣的情況。開包後，SMD-LED 產品須存放在溫度 <30°C 和濕度 <50% 環境中，且在此環境下 SMD-LED 產品須在開包後 24 小時內使用完 <進行回流焊接>，如使用時間超過 24 小時則須重新烘烤後再使用。
- ◇ Before unpacking, please check whether there is air leak in the packing bag. After bag opening, the SMT-LED must be stored under the condition < 30°C and < 60%RH. Under this condition, SMT-LED must be used (subject to reflow) within 24 hours after bag opening, and re-baking is required when exceeding 24 hours.
- ◇ 以上所指的烘烤是將 SMD LED 放入烤爐中在溫度為 65±5°C 且相對濕度 ≤10% 的條件下烘烤 24 小時。
- ◇ For baking, place SMT-LED in oven at temperature 80°C±5°C and relative humidity ≤10%RH, for 24 hours.

4. 清洗 Cleaning

- ◇ 不要使用不明化學藥品清洗 SMD-LED; 不明化學藥品可能損壞 SMD-LED. 當必要清洗時，把 SMD-LED 浸泡在酒精裡，在正常室溫下沉浸少於 1 分鐘，並讓其自然乾燥，時間為 15 分鐘，然後才能開始使用。
- ◇ Don't use unspecified chemical liquids to clean the SMT-LED; the chemical could harm the SMT-LED. When washing is necessary, please immerse the SMT-LED in alcohol at normal room temperature for less than 1 minute and dry at normal room temperature for 15 minutes before use.
- ◇ SMD-LED 的超聲波清洗影響依賴的因素有:超聲波的能量和 SMD-LED 裝配方法.超聲波清洗方法必須是預先評估合格的且保證不會對 SMD-LED 造成損害。
- ◇ The influence of ultrasonic cleaning on the SMT-LED depending on factors such as ultrasonic power and the way SMT-LED are mounted. Ultrasonic cleaning shall be pre-qualified to ensure this will not cause damage to the SMT-LED.

5. 靜電放電和衝擊電流 Electrostatic Discharge and Surge current

- ◇ 靜電放電 (ESD) 或衝擊電流 (EOS) 會損害 SMD-LED。
- ◇ Electrostatic discharge (ESD) or surge current (EOS) may damage SMT-LED.
- ◇ 預防措施有:在任何時候處理 SMD-LED 時都要佩帶靜電護腕,穿靜電鞋,戴防靜電手套。

- ✧ Precautions such as ESD wrist strap, ESD shoe strap or antistatic gloves must be worn whenever handling of SMT-LED.
- ✧ 所有的裝置,設備,儀器均須完全接地。
- ✧ All devices, equipment and machinery must be properly grounded.

最終檢查時建議對產品進行電性測試,以篩選出有問題的產品。

- ✧ It is recommended to perform electrical test to screen out ESD failures at final inspection.
- ✧ 最重要的是消除那些很有可能性存在的衝擊電流的電路設計。
- ✧ It is important to eliminate the possibility of surge current during circuitry design

6. 熱處理 Heat Management

- ✧ 熱處理必須考慮 SMD-LED 的應用場所,電流應當根據產品規格書所提供的電流應用曲線圖作適當的變動
- ✧ Heat management of SMT-LED must be taken into consideration during the design stage of SMT-LED application. The current should be de-rated appropriately by referring to the de-rating curve attached on each product specification.

7. 焊接 Soldering

• 用烙鐵手動焊接 Manual soldering by soldering iron :

- ✧ 焊接時推薦使用的電烙鐵小於 25W,當在焊接產品時烙鐵的溫度應保持在 315°C以下且須在 3 秒內完成焊接。
- ✧ The use of a soldering iron of less than 25W is recommended and the temperature of the iron must be kept at below 315°C, with soldering time within 3 seconds.
- ✧ 焊接時烙鐵頭不要接觸到 SMD-LED 環氧樹脂部分。
- ✧ The epoxy resin of SMT-LED should not be in contact with tip of soldering iron.
- ✧ 焊接時不要有任何機械壓力施加在產品環氧樹脂頂部。
- ✧ No mechanical stress should be exerted on the resin portion of SMT-LED during soldering.
- ✧ 焊接完產品後,只有當產品溫度降到 40°C以下時才可以進行後續的處理,這是為了防止產品由於後續工作的機械的熱壓力而失效。
- ✧ Handling of SMT-LED should be done when the package has been cooled down to below 40°C or less. This is to prevent the SMT-LED failures due to thermal-mechanical stress during handling.

8. 修補 Repair

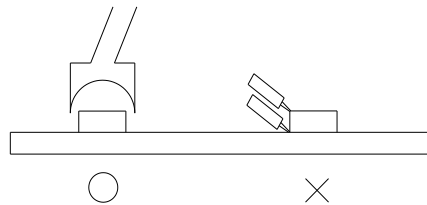
- ✧ LED 回流焊後不應該修復,當修復是不可避免時,必須使用雙頭烙鐵(如下圖),但必須事先確認此種方式會或不會損壞 LED 本身的特性。

LED Should not be repaired in reflow , When repair is inevitable , a double-head soldering iron should be used .It should be confirmed in advance whether the characteristics of LEDs will or will not be damaged by repairing ;

注意事項 Cautions :

LED 封裝為矽膠，故 LED 膠體表面較軟，用力按壓膠體表面會影響 LED 可靠性，因此應有預防措施避免在封裝的零件上的強大壓力，當使用吸嘴時，膠體表面的壓力應是恰當的。

The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when use the picking up nozzle, the pressure on the silicone resin should be proper.



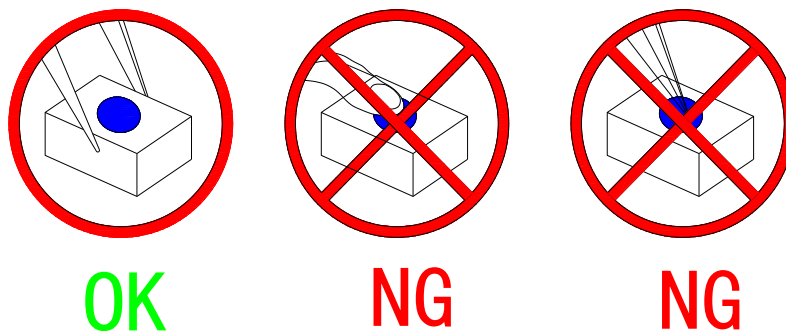
9. 處理防備措施 Handling precautions

- 相對環氧樹脂較脆較硬而言，矽膠封裝較柔軟且有彈性，雖然它的特性大大減少了熱應力，但易受機械外力損壞，因此在手工處理方面須要對矽膠封裝材料做預防措施，若未按要求操作，可能會導致 LED 損壞和光衰

Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more prone to damage by external mechanical force . As a result, Special handling precautions must be observed during assembling using silicone encapsulated LED products, Failure to comply might leads to damage and premature failure of the LED.

9-1.通過使用適當的工具從材料側面夾取，不可直接用手或尖銳金屬壓膠體表面，它可能會損壞內部電路

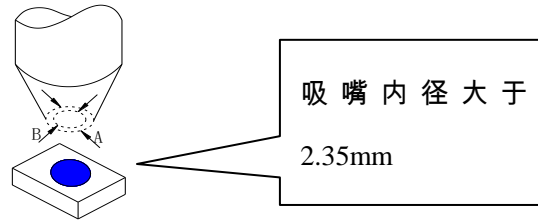
Handle the component along the side surface by using forceps or appropriate tools; do not directly touch or Handle the silicone lens surface, it may damage the internal circuitry



9-2.為防止氣壓洩漏，SMD 吸咀外徑不可以超過 LED 尺寸，吸咀內徑尺寸應盡可能大，吸咀頂端材質建議採用柔軟材料以防在吸取期間刮傷或損壞 LED 膠體表面，元件的尺寸必須在取放機裡準確的程式設計好，以確保精確的吸取和避免生產過程中的損害。

The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible. A pliable material is suggested for the nozzle tip to avoid

scratching or damaging the LED surface during pickup. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



9-3. 不可將模組材料堆積在一起，它可能會損壞內部電路

Do not stack together assembled PCBs containing LEDs. Impact may scratch the silicone lens or damage the internal circuitry

9-4. 不可用在 PH<7 的酸性場所

Not suitable to operate in acidic environment, PH<7

9-5. LED 材料使用時以及工作環境其硫元素組成不能超過 100PPM

LED operating environment and sulfur element composition cannot be over 100PPM in the LED mating usage material

9-6. 當 LED 應用產品需要滴膠時，請確保滴膠膠水與 LED 封裝膠相匹配。另外，由於大多數 LED 封裝膠為矽膠，具有較強的透氧性和透濕性；為了防止外部材料進入 LED 內部，可能導致 LED 的故障，溴元素的單一含量必須小於 900PPM，氯元素的單體含量要求小於 900PPM，應用產品外膠中溴元素和氯元素的總含量要求小於 1500PPM。

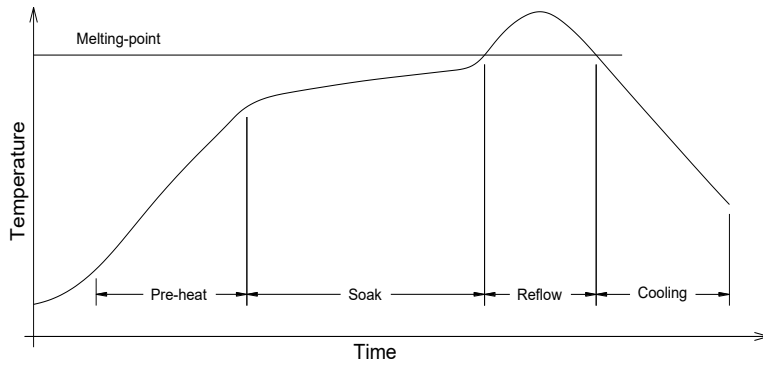
When we need to use external glue for LED application products, please make sure that the external glue matches the LED packaging glue. Additionally, as most of LED packaging glue is silica gel, and it has strong Oxygen permeability as well as strong moisture permeability; in order to prevent external material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM, the single content of Chlorine element is required to be less than 900PPM, the total content of Bromine element and Chlorine element in the external glue of the application products is required to be less than 1500PPM

9-7. 當 LED 應用產品需要使用外膠時，需要將溫度控制在 55°C 以下，正如我們在 9-6 提到的，膠體中含有氯元素，會破壞 LED 燈珠。

When we need to use external glue for LED application products, we need to control the over temperature under 55°C, As we mentioned at 9-6, the external glue contain Chlorine element, it can destroy the led.

●回流焊接 SMT Reflow Soldering Instructions

回流焊接溫度曲線建議如下 Suggested Welding Temperature Curve :



焊料 (錫 63 和鉛 37) solder (Sn63/Pb37)	焊料 (無鉛焊料) solder(Sn/Bi/Ag)
波峰上升平均速度 Peak rise average speed:4°C/s	波峰上升平均速度 Peak rise average speed:最快 3°C/s
預熱溫度 preheat temperature:100~150°C	預熱溫度 preheat temperature:130~170°C
預熱時間 preheating time:最長 less than 100 秒	預熱時間 preheating time:最長 less than100 秒
波峰下降平均速度 Peak descent average speed: 最快 6°C/s	波峰下降平均速度 Peak descent average speed: 最快 6°C/s
波峰溫度 Crest temperature:最高 240°C	波峰溫度 Crest temperature:最高 255°C
在波峰頂部溫度 5°C內的時間 The time at the top of the wave at 5 degrees:最長 10 秒	在波峰頂部溫度 3°C內的時間 The time at the top of the wave at 3 degrees:最長 10 秒
在 183°C上持續時間最長為 80 秒 The maximum duration is 80 seconds at 183 degrees centigrade	在 200°C上持續時間最長為 40 秒 The maximum duration is 40 seconds at 200 degrees centigrade

- ✧ 當焊接完成後,修正焊接是不推薦的.如實在避免不了修焊，則修焊後必須被驗收合格，以免由於修焊而破壞 SMD-LED 燈體。
- ✧ Repair is not recommended when soldering is completed.Repair soldering is unavoidable， it must be checked and accepted after repairing,Preventing repair Destroy LEDS
- ✧ 回流焊接最多只能進行兩次。
- ✧ Reflow soldering should not be done more than two times ;
- ✧ 在焊接時不要在燈體上施加任何壓力。

- ◇ When soldering , do not put stress on the LEDs during heating ;
- ◇ 焊接完後 PCB 不要馬上被包起來 , 要讓 PCB 板和 SMD-LED 產品自然散熱至常溫 25°C。
- ◇ After welding, PCB can not be wrapped immediately, we should let the PCB board and the SMD-LED products cooling natural state.

可靠性試驗標準

類別	試驗項目	參考標準	試驗條件	持續時間	接收標準
環境試驗	溫度迴圈	JESD22-A104-A	-40°C ~ 25°C ~ 100°C ~ 25°C 30 分鐘,5 分鐘,30 分鐘,5 分鐘	迴圈 100 次	0/50
	冷熱衝擊	JESD22-A106	-40°C ~ 100°C 30 分鐘,30 分鐘	迴圈 100 次	0/50
	高溫高濕測試	JIS C 7021 (1977)B-11	Ta=80°C RH=80%	1000 小時	0/50
壽命試驗	常溫壽命測試	JESD22-A108-A	Ta=25°C 試驗條 件:R=20mA,G=15mA,B=15mA	1000 小時	<3%
	高溫高濕壽命 測試	JESD22-A101	Ta =85°C RH=85% 試驗條 件:R=20mA,G=20mA,B=20mA	1000 小時	<5%
破壞性試驗	耐焊性試驗	JESD22-A113	Tsol=245°C,t=10sec.	10 秒	0/20
靜電測試	靜電放電試驗	AEC(Q101-002)	人體放電模式 1000V	--	0/10
機械振動試驗	機械振動	MIL-STD-883 Method 2007	20G 分鐘,20 to 2000Hz 4 個迴圈,4 分鐘.Each,X,Y,Z	--	0/50