Data Sheet of High Power 3W White LED

客户名称		**Product Name**	3W High Power White LED
客户物料编号		**Model No**	HW21030701
			HW09300345
			HW22122801
产品规格		版本号	A0

供应商确认			
拟定	审核	批准	日期
何欢	文思	罗泽永	2023-3-23

客户确认			
采购	工程	品管	日期

深圳市光明新区公明镇楼村世峰科技园 F 栋 5 楼
Tel.: 86-755-29694811 Hu'S
Fax: 86-755-29536086
Http: //www.tengjie-led.com, http://www.led818.com
E-mail: led@tengjie-led.com

■Applications

Interior automotive lighting (dashboard backlight etc…)

Optical indicators

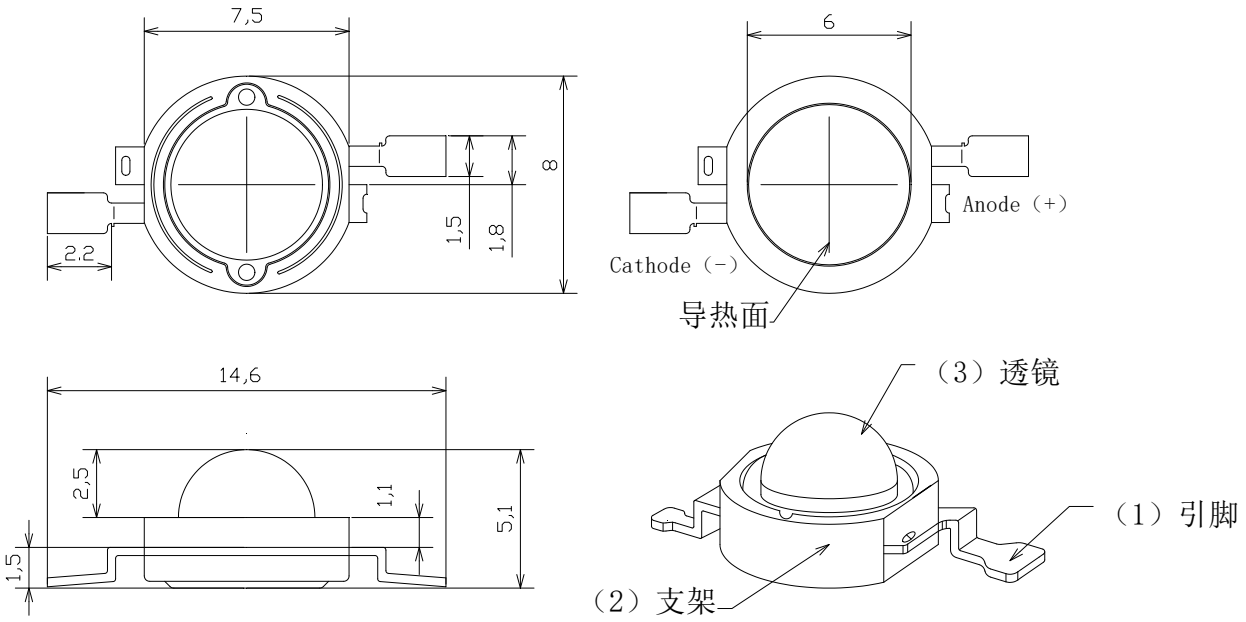
Communication Products

Backlighting

Flash

Toy

■Package Dimensions



Notes:

1. All dimensions are in millimeters.
2. Tolerance is ±0.20mm unless otherwise noted.
3. Protruded resin under flange is 1.0mm max
4. Lead spacing is measured where the leads emerge from the package.
5. Caution in ESD:

Static Electricity and surge damages the LED. lt is recommending to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.

■ Absolute Maximum Ratings (Ta = 25℃)

Parameter	Symbol	Colour	Value	Unit
Power Dissipation	Pd	White/Warm White/Cool White	3.0	W
Peak pulsing current（1/8 duty f=1KHz）	Ifp	White/Warm White/Cool White	1000	mA
Forward Current	If	White/Warm White/Cool White	700	mA
Operating Temperature Range	Top	White/Warm White/Cool White	-35~+120	℃
Storage Temperature Range	Tstg	White/Warm White/Cool White	-40~+125	℃
Junction Temperature	Tj	White/Warm White/Cool Whitee	115	℃
Electrostatic Discharge	ESD	White/Warm White/Cool White	2000(HBM)	V
Lead Soldering Temperature	260℃ for 3 Seconds			

■ Typical Electrical & Optical Characteristics (Ta = 25℃)

Parameter	Colour	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward Voltage	PW/WW/CW	VF	3.0	--	3.6	V	IF=700mA
Viewing Angle	PW/WW/CW	2θ1/2	--	120	--	Deg	IF=700mA
Reverse Current	PW/WW/CW	Ir	--	--	10	μA	Vr=5V

■ Color temperature Guide (Ta = 25℃)

Colour	Temperature	Min.	Typ.	Max.	Unit	Test Condition
White	CCT	6000	--	6500	K	IF=700mA
Warm White	CCT	2800	--	3000	K	IF=700mA
Cool White	CCT	8000	--	10000	K	IF=700mA

■ Luminous Intensity/Light Intensity Guide(Ta = 25℃)

Colour	Symbol	Min.	Typ.	Max.	Unit	Test Condition
White/Cool White	Φv	220	--	280	LM	IF=700mA
Warm White	Φv	200	--	260	LM	IF=700mA

■ Notes:

1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.
3. It use many parameters that correspond to the CIE 1931 2° . X, Y, and Z are CIE 1931 2° values of Red, Green and Blue content of the measurement.

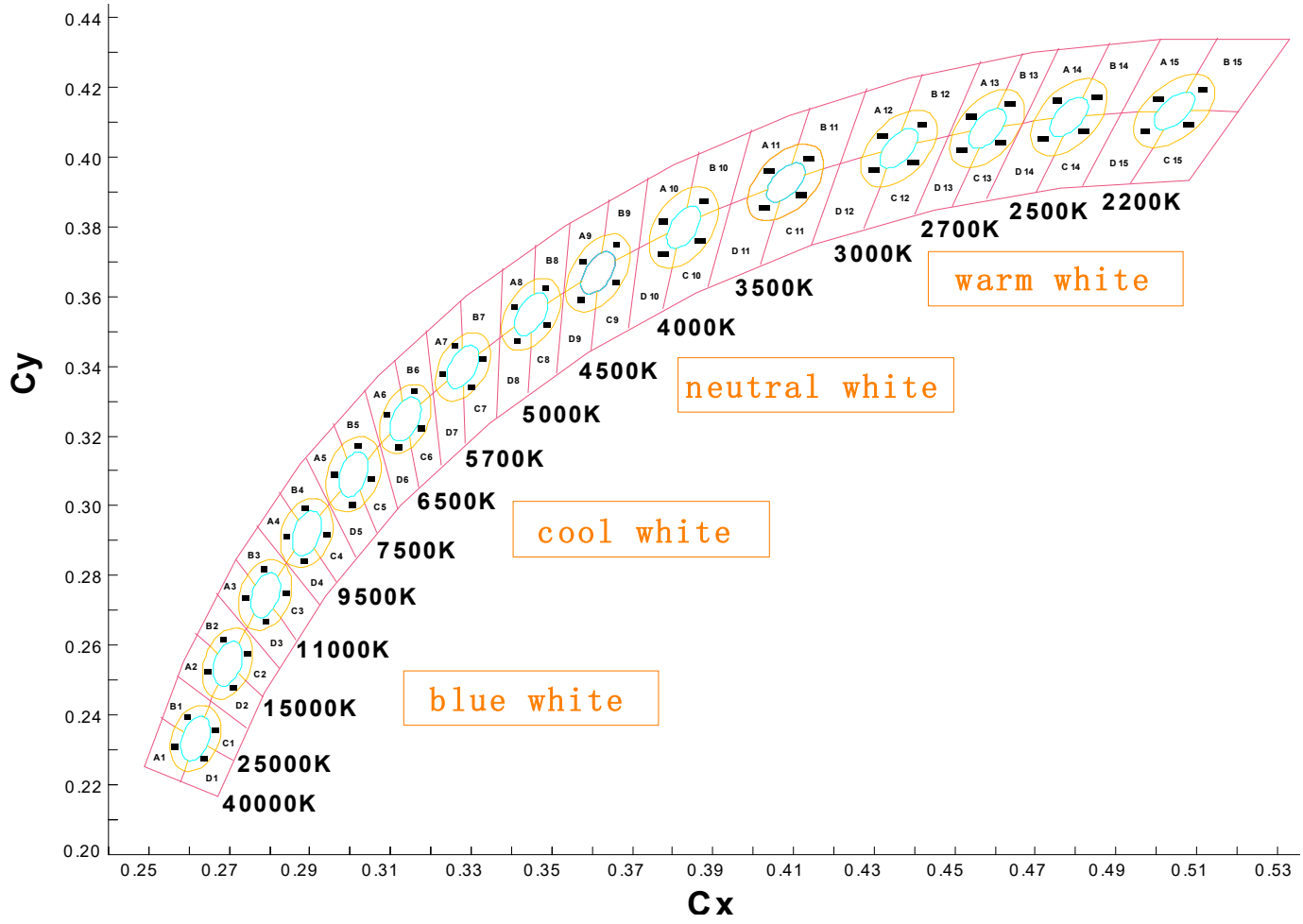
■ Chromatic Coordinates Ranks(ERP):

CCT	center		6step a	6step b	Ø	step
	x	y				
6430	0.3130	0.3370	0.00221	0.00095	58.56757081	6
5000	0.3460	0.3590	0.00274	0.00119	59.62441419	6
4040	0.3800	0.3800	0.00313	0.00134	53.71493233	6
3450	0.4090	0.3940	0.00309	0.00138	54.00208172	6
2940	0.4400	0.4030	0.00278	0.00137	53.21465163	6
2720	0.4630	0.4200	0.00258	0.00134	57.2799465	6

■ Chromaticity Coordinate Groups(ANSI):

CCT	center		6step a	6step b	Ø	step
	x	y				
6530	0.3123	0.3282	0.00223	0.00095	58.57	6
5665	0.3287	0.3417	0.00249	0.00107	59.09	6
5028	0.3447	0.3553	0.00274	0.00119	59.62	6
3985	0.3818	0.3797	0.00313	0.00134	53.71	6
3465	0.4073	0.3917	0.00309	0.00138	54	6
3045	0.4338	0.4030	0.00278	0.00137	53.21	6

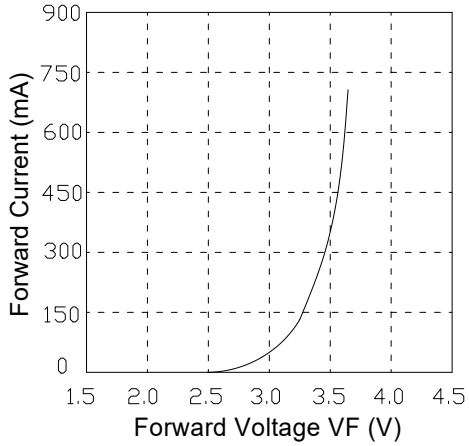
■Chromaticity Coordinate Groups:


Cy
Cx
0.44
0.42
0.40
0.38
0.36
0.34
0.32
0.30
0.28
0.26
0.24
0.22
0.20
0.25
0.27
0.29
0.31
0.33
0.35
0.37
0.39
0.41
0.43
0.45
0.47
0.49
0.51
0.53
2200K
2500K
2700K
3000K
3500K
4000K
4500K
5000K
5700K
6500K
7500K
9500K
11000K
15000K
25000K
40000K
warm white
neutral white
cool white
blue white

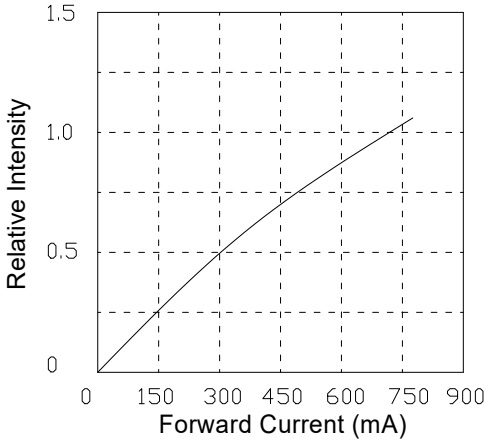
■ Typical Electrical/ Optical Characteristics Curves

(Ta=25°C Unless Otherwise Noted)

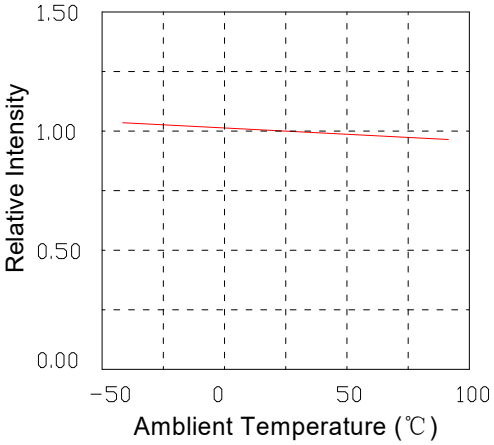
Forward Voltage VS. Forward Current (Ta=25℃)



Relative Intensity VS. Forward Current (Ta=25℃)

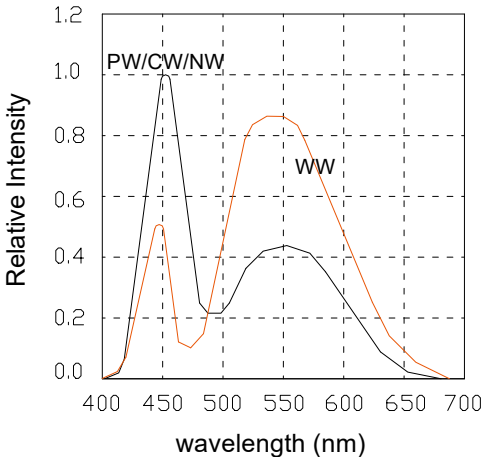


Relative Intensity VS. Ambient Temperature



Spectral Distribution

Relative Intensity VS. Wavelength (Ta=25℃)



Derating

Ambient Temperature VS. Maxinum Forward Current

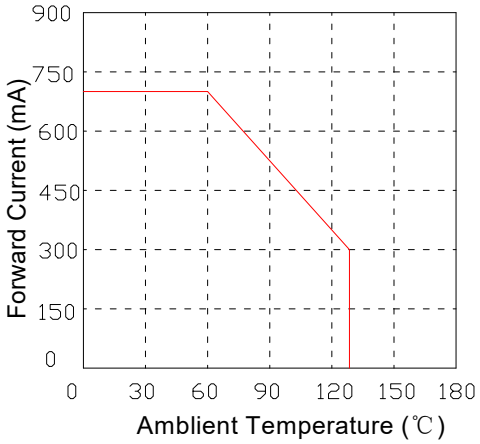
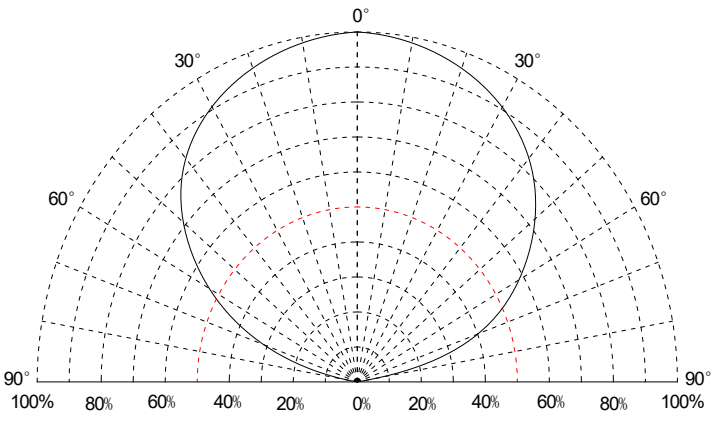


Diagram characteristics of radiation



Note: The data shown above are typical curves. Every LED component may have some variations of characteristics.

■ Test Items and Conditions:

No.	Test Item 测试项目	TJ. Standard 腾杰参照标准	Test Conditions 测试条件	Note 频次	Number of Damaged 允许破坏数
01	Temperature Cycle 高低温循环	JIS C 7021 (1977)A-4	-25°C 30min ↑↓5min 80°C 30min	100 cycle	0/22
02	Thermal Shock 冷热冲击测试	MIL-SLD-107D	-25°C 15min ↑↓5min 80°C 15min	50 cycle	0/22
03	High Humidity Heat Cycle 高温度热循环	JIS C 7021 (1977)A-5	30°C〈=〉65°C 90%RH 24hrs/1cycle	10 cycle	0/22
04	High Temperature Storage 高温存储	JIS C 7021 (1977)B-10	T_a=80℃	1000 hrs	0/22
05	Humidity Heat Storage 高温高湿存储	JIS C 7021 (1977)B-11	T_a=60°C RH=90%	1000 hrs	0/22
06	Low Temperature Storage 低温贮藏	JIS C 7021 (1977)B-12	T_a=－30°C	1000 hrs	0/22
07	Life Test 常温寿命测试	JIS C 7035 (1985)	T_a=25°C I_F=700mA	1000 hrs	0/22
08	High Humidity Heat Life Test 高温高湿寿命测试	❶	60°C RH=90% I_F=700mA	500 hrs	0/22
09	Low Temperature Life Test 低温寿命测试	❶	Ta=-25°C I_F=700mA	1000 hrs	0/22

❶ Refer to reliability test standard specification for in this line. 请参考可靠性测试标准规范

■ Criteria For Judging Damage:

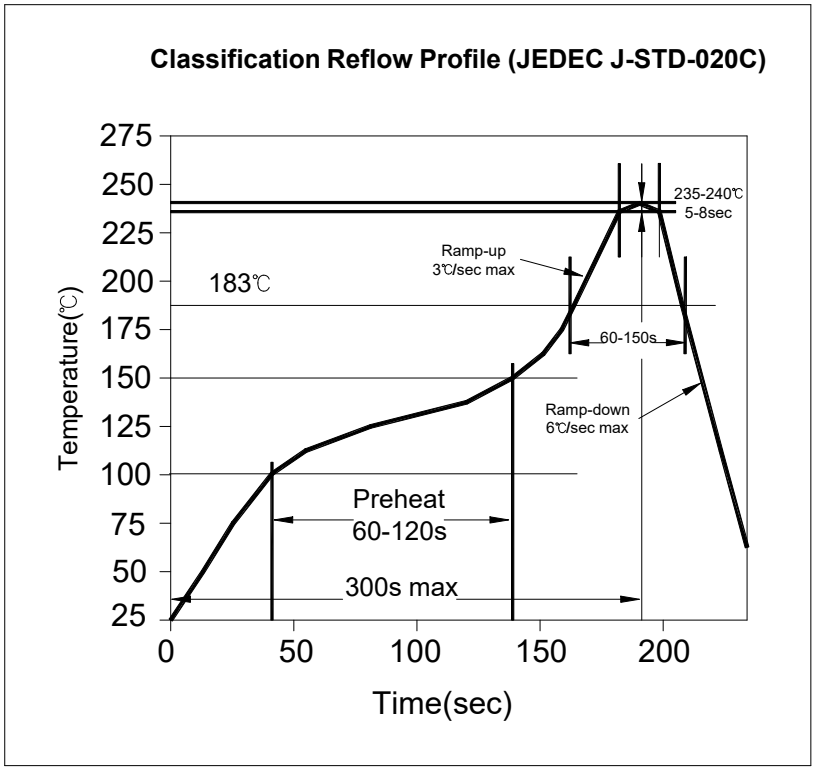
No.	Test Item 测试项目	Symbol 符号	Test Conditions 测试条件	Decision criteria 判定标准
01	正向电压 Forward Voltage	V_F	I_F=I_{FT}	初始值±10% Initial Data±10%
02	反向电流 Reverse Current	I_R	V_R=5V	I_R≦10μA
03	光强 Luminous Intensity	I_V	I_F=I_{FT}	平均 I_V 衰减≦30%，单个平均 I_V 衰减≦50% Average I_V degradation≦30%　Single LED I_V degradation≦50%
04	耐焊接热 Resistance to Soldering Heat	--	--	材料无内部裂痕、无材料间爆裂、剥离、无死灯 Meterial without internal cracks, no material between stripped, no deaded light.

*The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

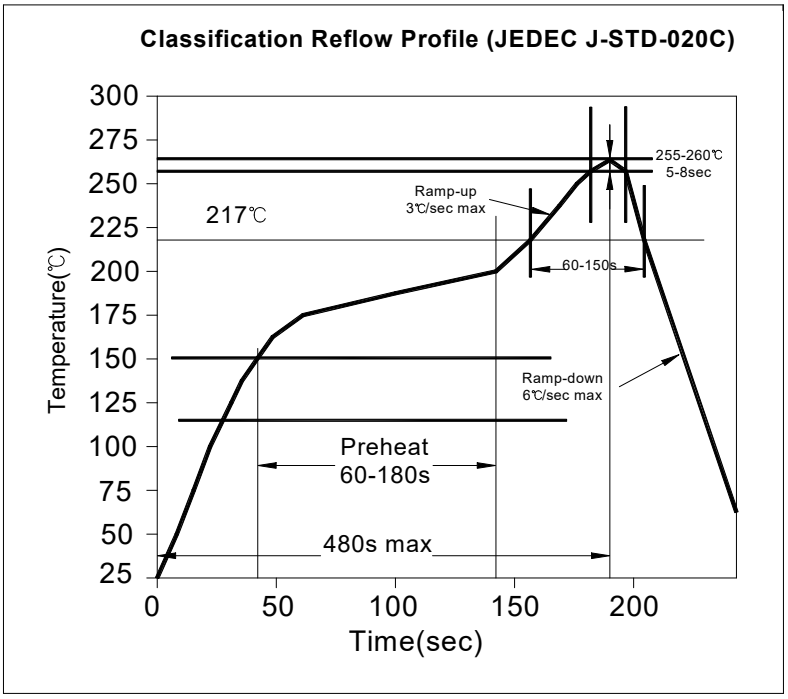
数据工作表中所示的技术信息仅限于典型特征和电路实例引用的产品.它既不构成工业特性的保证,也不构成任何许可的授权

■Soldering heat reliability:

Lead Solder



Lead-Free Solder



■Precaution of Application 应用预防措施

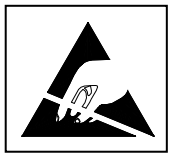
1: Circuit layout

Due to the forward voltage of LED will vary with temperature and its driving current, the current- limited protective circuit should be considered in the LED circuit design.

When LEDs are arrayed as parallel circuit, different inherent resistance of LED will cause unbalance current. The unbalanced driving current which exists in every parallel circuit may make LED to be driven at different power. Therefore, the LED driven at higher power may be damaged by over driving current, and the LED driven at lower power may be dimmer than the others.

To solve this situation, a suitable resistor is recommended to put in series with each LED circuit. The resistor will limit and balance the driving current which flows through every parallel circuits.

2: Electric Static Discharge (ESD) Protection



All kinds of LED materials, such as GaP, AlGaAs, AlInGaP, GaN, or InGaN chips, are STATIC SENSITIVE device. ESD protection or surge voltages shall be considered and taken care in the initial design stage, and whole production process.

The following protection is recommended:

(1) A wrist band or an anti-electrostatic glove shall be used when handling the LEDs
(2) All devices, equipment and machinery must be properly grounded

If LED is damaged by ESD or surge voltage, damaged LED may show some unusual characteristics. It may appear leakage current, and LED does not emit at low current.

And when using microscope to inspect damaged LED chip at low driving current, it may have some black dots within the emitting area.

3: Pick and Place

The following items should be paid attention in assembly process:

(1) It should be avoided to load stress on the resin during pick and place process, especially at high temperature.
(2) Avoid rubbing or scraping the resin by any object, and avoid leaving fingerprints on the lens.
(3) Electric-static may cause damage to the component. Please confirm that the equipment is grounding well.

4: Storage

It's recommended to store the products in the following conditions:

(1) Shelf life in sealed bag: 3 months at T_A<40℃ and Hum.<30%RH.(Base on aluminum laminated moisture barrier bag.)

(2) After the package bag is opened and kept in the following environment, the LED products should be used completely as soon as possible:

Humidity (Hum.) : 60%RH Max.

Temperature (T_A) : 5℃ ~30℃ (41℉ ~86℉)

Assembly duration: within 4 hours, after bag is opened.

If the some of LED are not used, they need to be kept at Hum.≦10%RH in zip-locked sealed bags. And if the duration exceeds 4 hours, re-baking process is required to keep LED from moisture.

Please avoid rapid transitions in ambient temperature, especially in high humidity environment where condensation can occur.

5: Cleaning

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended to clean the LED, after soldering process, if cleaning is necessary. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

It is not recommended to use unspecified chemical liquids as cleaning material for cleaning the LED. It's also not recommended to use ultrasonic power to clean the LED device. The chemical and ultrasonic power could harm the LED devices.

6: Manual Soldering and Rework

The manual soldering process is not recommended for quality consideration. When it is absolutely necessary, the LEDs may be mounted in this fashion but the user will assume responsibility for any problems.

The the following conditions are recommended :

(1) Soldering material : SN60 (60% tin and 40% lead) solder or solder with silver content is recommended.

(2) Temperature of the iron : lower than 300°C

(3) Soldering time : maximum 3 seconds

(4) Operation cautions:

- Please avoid overheating of LED component in any process. Overheating may damange the LED package.

- Please don′ t place any stress on the lens of LED, especially at high temperature

7: Application

(1) The strong light from LEDs may injure human eyes. Precautions should be taken to prevent looking directly at the LEDs with unaided eyes.

(2) In order to get maximum light output during the duration of LED's long life, designer should consider how to make excellent thermal dissipation when making the whole system design. It's recommended to avoid intense heat generation and to operate within the maximum ratings given in this approval sheets.

(3) Every piece of LED will be sorted and LEDs with the same binning grade will be taped into the same reel or put into the same bag. It is recommended to use the same bin-grade LED to assembly the unit module. This will ensure the LED unit module with good uniformity of brightness, hue, and so on.