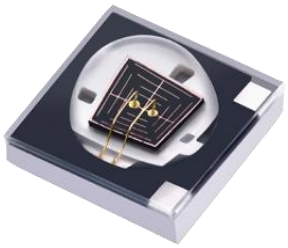
3535 IR LED Datasheet



Features:

- Slim Size SMD Package: Design Flexibility
- IR Wavelength: 730nm-940nm
- Ceramic Base & Low Thermal Resistance
- Faster Heat Dissipation
- Enviromental Friendly; ROHS Compliance
- Customized Service Available

Applications:

- Helipad Lighting, Obstruction Lights, Airport Warning Lights,
- Biomedical
- Infrared Spectroscopy, Camera
- Smart home, Iris/face Recognition.
- Infrared Monitor, Infrared Therapy, Infrared Communication

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PRODUCT NAMING RULES

LKL	XXXX	XX	XX	XXX	XXX
LKL	Type	Peak Wavelength	Radiant Power	Light Beam Angle	Chip
lekoled	3535	R1	Q1	0S/G: 120/140°	G42: Epileds 42mil
		R2	Q2	3S/G: 30°	E42: Epistar 42mil
		R3	Q3	6S/G: 60°	...
		...			

Code	Center Wavelength (nm)	Wavelength Range (nm)
R1	700	690-710
R2	730	720-740
R3	760	750-770
R4	780	770-790
R5	800 / 810	800-820
R6	820 / 825	820-830
R7	850	840-860
R8	880	870-890
R9	910 / 925	900-930
R10	940	930-950
R11	970 / 980	970-990
R12	1050	1000-1100
R13	1350	1300-1400
R14	1450	1400-1500
R15	1650	1500-1600

Code	Radiant Power Value (mW)
Q1	10-20
Q2	300-400
Q3	500-700
Q4	600-800
Q5	700-900
Q6	800-1200

CHARACTERISTICS

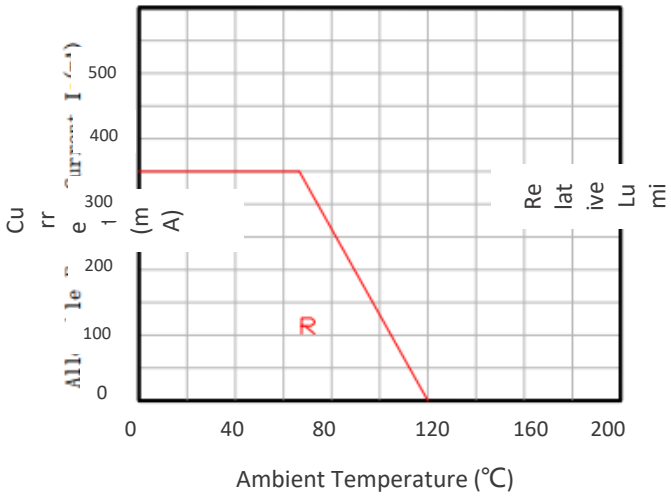
Peak Wavelength (nm)	Center Wavelength (nm)	Forward Voltage (V)	Forward Current (mA)	Radiant Flux (mW)	Model No.
690-710	700	1.8-2.4	700	300-400	LKL-3535R1Q20SG42
720-740	730	1.8-2.2	1000	800-1000	LKL-3535R2Q60SE42
760-780	760	1.6-2.0	700	500-700	LKL-3535R3Q30SL42
780-800	780	1.6-2.0	700	500-700	LKL-3535R4Q30SL42
800-820	800	1.4-1.8	700	500-700	LKL-3535R5Q30SL42
820-830	820	1.6-2.0	700	500-600	LKL-3535R6Q30SG42
840-860	850	1.4-1.8	1000	850-1200	LKL-3535R7Q60SE42
870-890	880	1.4-1.8	700	600-800	LKL-3535R8Q40SL42
900-920	910	1.4-1.8	700	800-1000	LKL-3535R9Q60SL42
915-935	925	1.4-1.6	700	600-800	LKL-3535R9Q40SG42
930-950	940	1.2-1.6	1000	900-1100	LKL-3535R10Q60SE42
960-980	980	1.2-1.6	700	700-900	LKL-3535R11Q50SL42
1000-1100	1050	1.0-1.4	1000	300-400	LKL-3535R12Q20SL42
1300-1400	1350	0.5-1.3	50	10-20	LKL-3535R13Q10SL14
1400-1500	1450	0.5-1.3	50	10-20	LKL-3535R14Q10SL14
1500-1600	1650	0.5-1.3	50	10-20	LKL-3535R15Q10SL14

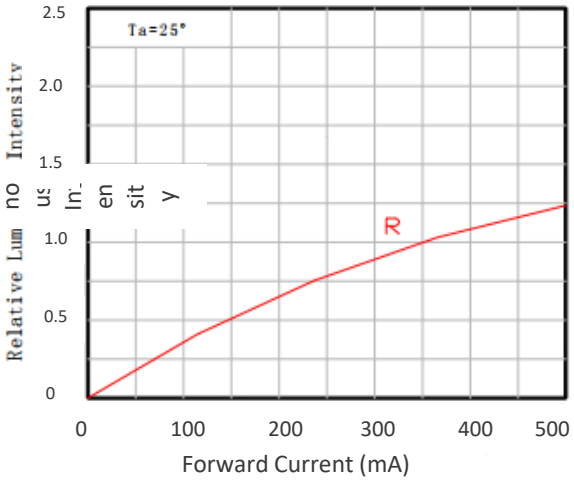
CHARACTERISTICS

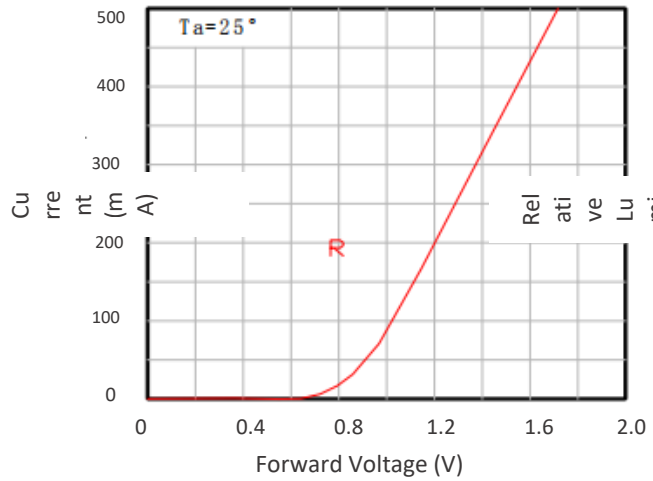
Absolute Maximum Ratings at Tj=25°C		
Parameters	**Symbol**	**Maximum Performance**
Forward Current	I_F	700-1000mA
Peak Pulse Current	I_{FP}	1500mA
Power Dissipation	P_D	3W
Reverse Voltage	V_R	5V
Reverse Current	I_R	10μ A
Viewing Angle	2θ 1/2	120°
Operating Temperature	T_{OPR}	-30 ~ +75°C
Storage Temperature	T_{STG}	-40 ~ +85°C
Junction Temperature	T_j	120°C
Soldering Temperature	T_{SLD}	Reflow Soldering: 230°C or 260°C for 10Sec

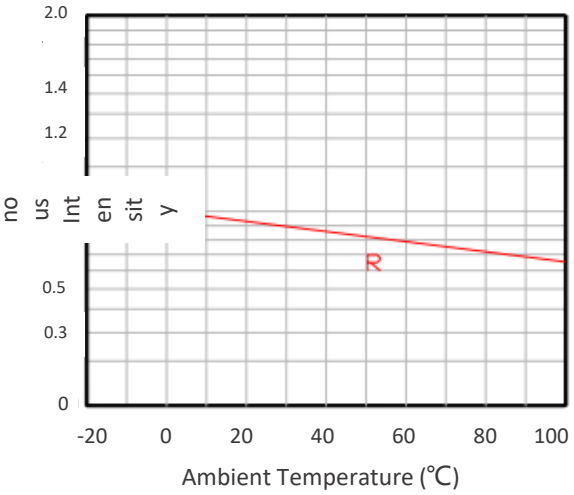
Electrical/ Optical Characteristics at Tj=25°C						
Parameters	**Symbol**	**Min**	**Type**	**Max**	**Unit**	**Condition**
Forward Voltage	v_F	0.5	---	2.4	V	IF=350mA
Radiant Flux	Φe	150	---	500	mW	IF=350mA
Peak Wavelength	λp	700	---	1650	nm	IF=350mA
Reverse Current	IR			10	μA	VR=5V
Thermal Resistance	Rth j-sp		8		°C/W	IF=350mA
Electrostatic Discharge	ESD	1000			V	HBM

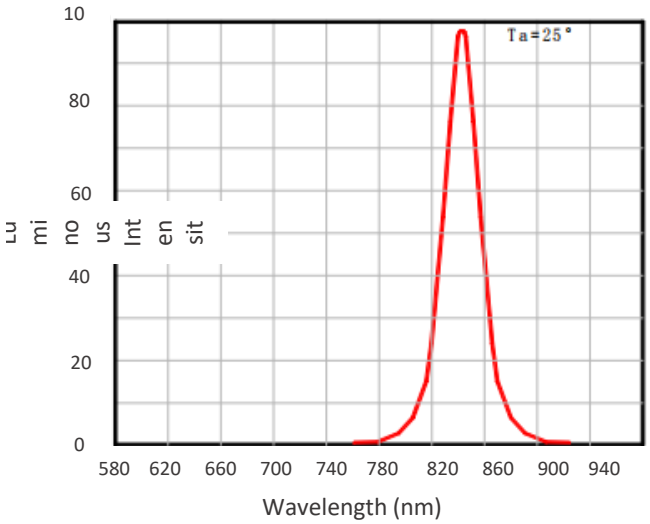
TYPICAL CHARACTERISTIC CURVES

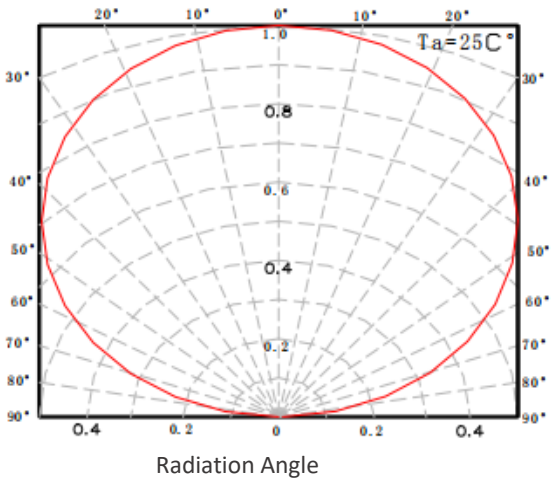












RELIABILITY TESTS

Test Items	Test Conditions	Sample QTY	Ac/Re
Aging Test	IF=700mA, Ta=25℃ x6000hrs	22	0/1
	IF=700mA, Ta=85℃ x6000hrs	22	0/1
High Temperature Storage	100℃ x1000hrs	22	0/1
Low Temperature Storage	-40℃ x1000hrs	22	0/1
High Temp & Humidity	IF=700mA, 85℃, 85% RH for 6000hrs	22	0/1
Temperature Shock	-40℃x30 min & +100℃x30 min, 100cycle	22	0/1
ESD(HBM)	2000V HBM/ 1 Time	10	0/1

Criteria for Judging LED Failure (Tc= 25℃)

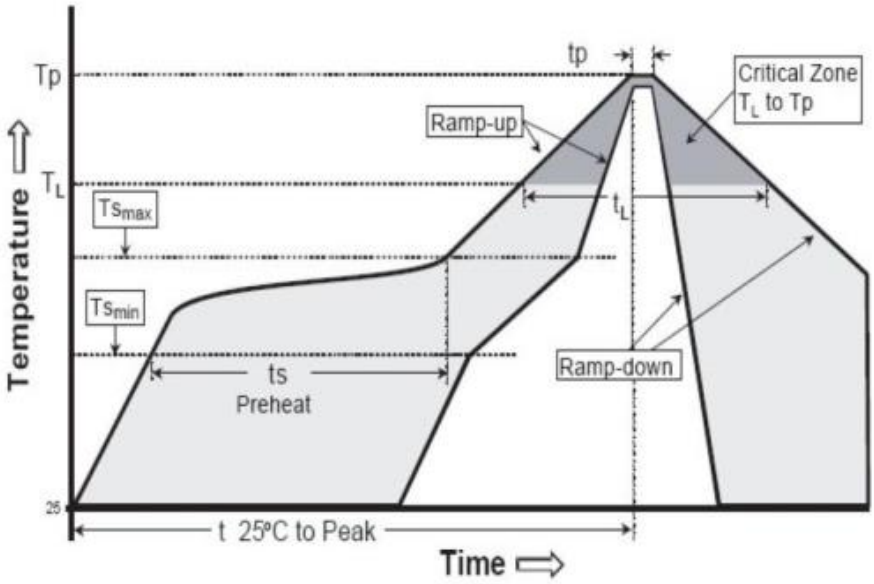
Items	Symbol	Test Conditions	Criteria for Judging LED Failure
Forward Voltage	VF	IF=700mA	>U x 1.1
Reverse Current	IR	VR=5V	IR>/= 10μA
Lumen	ΦV	IF=700mA	<S x 0.7

U refers to max value; S refers to initial value.

Notes: Judging criteria based on Tc=25℃.

TYPICAL CHARACTERISTIC CURVES

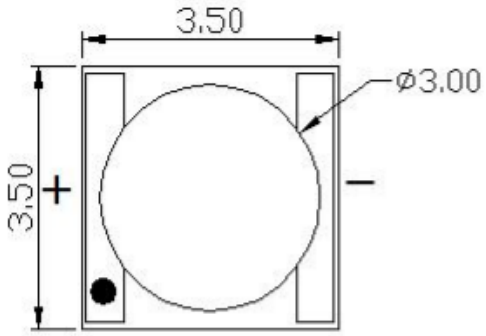
REFLOW SOLDERING PROFILE

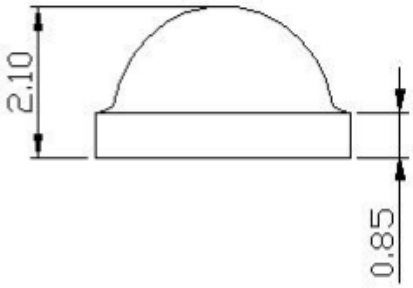


Profile Features	Lead-free solder	Lead solder	Soldering by Manual
Ramp-up Speed(Ts max to Tp)	3 °C/ second max.	3 °C/ second max.	Max. temperature: 350°C 3 seconds/1 time
Preheat: Min. Temperature(Tsmin)	150 °C	100 °C	
Preheat: Max.Temperature(Tsmax)	200 °C	150 °C	
Preheat: Time (tsmin to tsmax)	60~180 seconds	60~120 seconds	
Temperature to Keep: (TL)	217 °C	183 °C	
Time to Keep: (tL)	60~150 seconds	60~150 seconds	
Peak Temperature (Tp)	260 °C	215 °C	
Time within the peak temperature (tp)	20~40 seconds	10~30 seconds	
Ramp-down Speed	6°C/ second max.	6°C/ second max.	
Time to the peak Temperature	8 minutes max.	6 minutes max.	

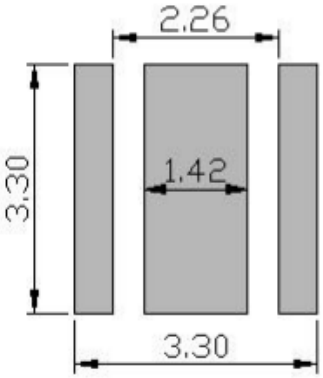
DIMENSIONS

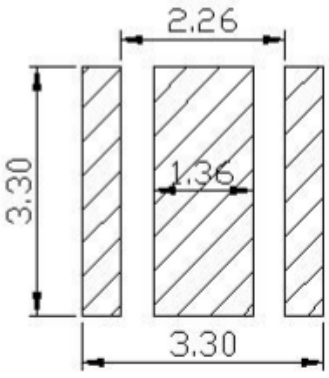
Unit: mm





Soldering Pad Dimension





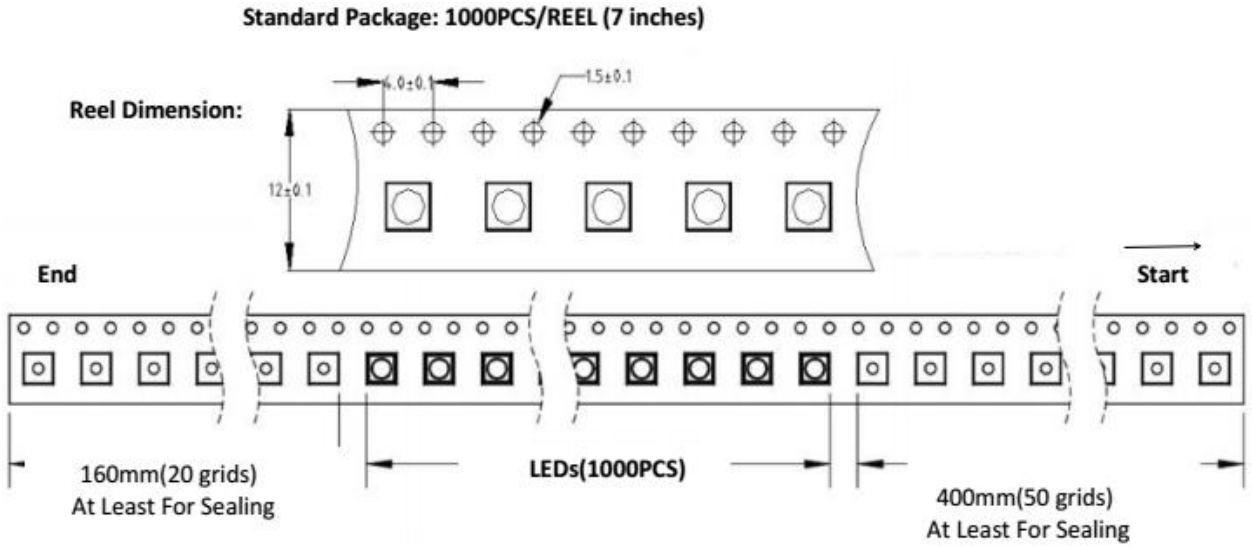
Notes：

*All dimensions are in millimeters.(tolerance:±0.1mm)

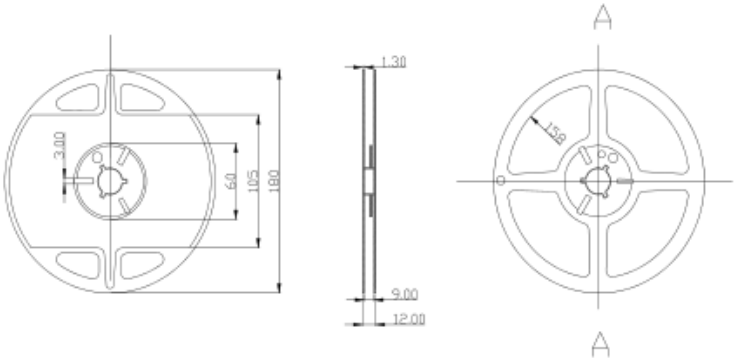
*The appearance and specifications of the product may be changed for improvement without notice.

PACKAGING

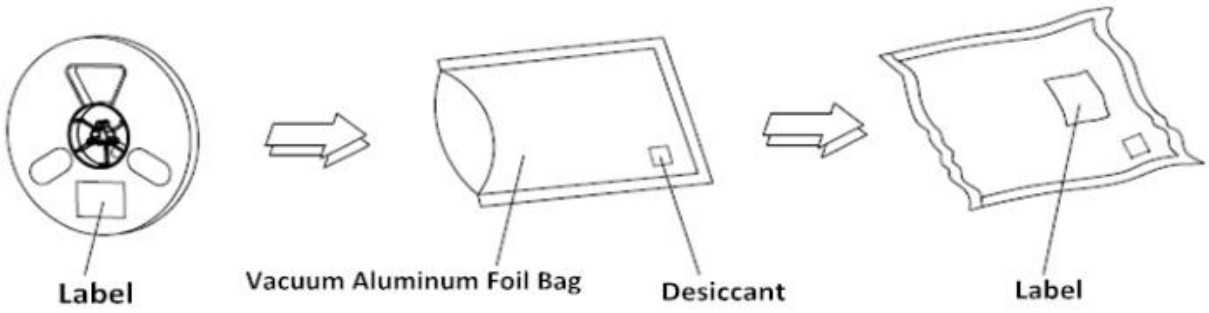
Tape Specifications (Units : mm)



Reel Dimensions



Moisture Resistant Packaging



PRECAUTIONS

Storage Condition

1. Product should be stored in a dry, less than 30% relative humidity environment, storage temperature 5~30℃.
2. Avoid damaging the vacuum bags by the external force, in case of flat bags and being affected with damp.
3. Guard against damp, if it is, there is a need to put the reel patch in 60℃ oven for 24 hours; After taking out the reel from the package, the lamp should be welded within 12 hours at best.
4. LEDS, already taking out from the original package but without being welded, should be stored in any of the following ways:
   a. After opening, the LED lamp can be sealed in the original vacuuming bags again.
   b. Put component into the solid metal container with closed lid for storage, fresh desiccant and humidity card should be put in the container at the same time, and test the related humidity less than 30%.
   c. Put component into dry cabinet or container purified by nitrogen, and the cabinet or container can effectively keep the relative humidity below 30%.
   d. Reflow soldering should be finished within 24 hours after opening the package, and workshop condition should be less than or equal to 30℃/60%RH.
   e. If there is no environment with relative humidity less than 30% for storage, it needs to bake for one hour before reflow soldering.
5. Stacking PCB or components of LEDs containing X series, don't drop all the weight on the lens of lamp. The force on the lens can lead to lamp falling off, and at least 2cm should be set aside above LED lens. Also, foam wrapping paper shouldn't be used directly on the lamp, LEDs may be damaged by the force from the foam wrapping paper.

Reflow Soldering Conditions

1. PCB board should be prepared or cleaned according to manufacturer's standards, then LED lamp can be put or welded on the PCB.
2. Our company LED design is used for welding on the PCB by reflow soldering. Reflow soldering can be finished in the reflow furnace, or put the PCB on the hot plate and operate according to the reflow soldering temperature curve.
3. Pay attention to reflow soldering conditions when using, the reflow soldering temperature should be debugged before using reflow soldering. Reflow soldering condition: preheating temperature 100~150℃, reflow soldering temperature 230~260℃, welding time within 10sec. Operators should receive electrostatic protective measures, and all equipment must be reliable grounding.
4. Reflow soldering is no more than 2 times.
5. Force and pressure should not be exerted on the lamp when carrying out reflow soldering.
6. PCB can not be packaged immediately after reflow soldering, and there needs natural cooling for PCB and lamp.

Cleaning after Reflow Soldering

1. Lamp should be cooled to room temperature after welding, then carrying out subsequent processing. Early to deal with the component, especially the part around the lens, may lead to damage of product.

PRECAUTIONS

2. The consistency of the weld is suggested to check. After avoiding the selected components on printed circuit boards, it seems to achieve full circle during welding process(no obvious welding particles). Looking from the back of package and PCB, empty holes should be seen hardly in welding area.
3. When cleaning PCB after welding, isopropyl alcohol can be used to clean PCB but without ultrasonic cleaning. Also the PCB board already equipped with lamps can not be cleaned by water.
4. Don't use the following chemicals for cleaning:

a. Chemicals that may lead to outgassing of aromatic hydrocarbon compounds(such as toluene, xylene)

b. Methyl acetate and ethyl acetate (i.e., nail cream cleaner)

c. Cyanoacrylate (i.e., the super glue)

d. Ethylene glycol (including Radio Shack ® precision electronic cleaning agent)

e. PLIOBOND ® adhesives

Installation Methods

1. White LED has anti-static requirements, so corresponding anti-static measures should be taken during the process of installation and use.
2. Pay attention to the exterior line arrangement of all kinds of devices to avoid wrong polarity. Devices can't be too close to the heating elements, and working conditions can not exceed the prescribed limits.
3. When deciding to install in the hole, the size and tolerance of hole and distance between holes on PCB need to be well calculated to avoid excessive pressure forcing on the plate.
4. Avoid any vibration and external force on LED.

Working Conditions

1. In order to make LED work under a stable condition, protective resistance must be in series, and the resistance can be measured by supplied voltage or current of LED. LED working voltage and current are endowed by specifications of different LEDs.
2. There needs the circuit design to be carried out to prevent super voltage(or super current) when witching LEDs, short current or pulse current can both damage the connection of LED.
3. When LED source working, ambient temperature can affect the reliability of life, so please keep away from the heat source at work. At the same time, surface temperature is required to keep within 60℃.
4. Based on the incompatible volatile organic compounds existing in the LED solid-state lighting design, these may weaken the performance of the lighting system and shorten its service life, so please avoid using organic compounds during the process of design and working.

Other matters

1. This product is silicon encapsulation, so please avoid hard objects extrusion.
2. All the equipments contacting LED must be grounded, and operators must wear grounded anti-static gloves, anti-static shoes and anti-static clothing.