Optical Characteristics at 700mA, Junction Temperature, Tj=25℃

Color	Lens Type	Total Included Angleθ0.9v (degree)	Viewing Angle2θ1/2 (degree)	Typical Candela on Axis (cd)
White	AL	160	125	
Neutral White		160	125	
Warm White		160	125	
White	BL	160	135	
Neutral White		160	135	
Warm White		160	135	

Electrical Characteristics at 700mA, Junction Temperature, Tj=25℃

Color	Forward Voltage Vf(V)			Dynamic Resistance(Ω)	Temperature Coefficient of Vf(mV/℃) ΔVf/ΔTj	Thermal Resistance Junction to Board (℃/W)
	Min.	Typ.	Max.			
White	6.00	7.00	7.80	2.0	-4	2.2
Neutral White	6.00	7.00	7.80	2.0	-4	2.2
Warm White	6.00	7.00	7.80	2.0	-4	2.2

White Color Spectrum

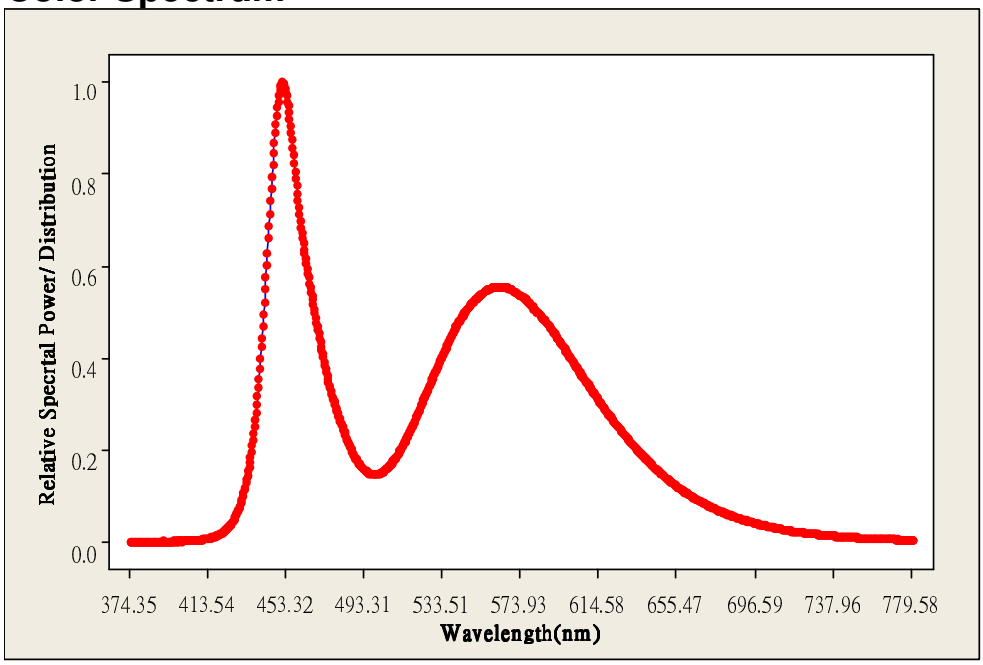


Figure 1b. White Color Spectrum of Typical 5500K Part.

Warm White Color Spectrum

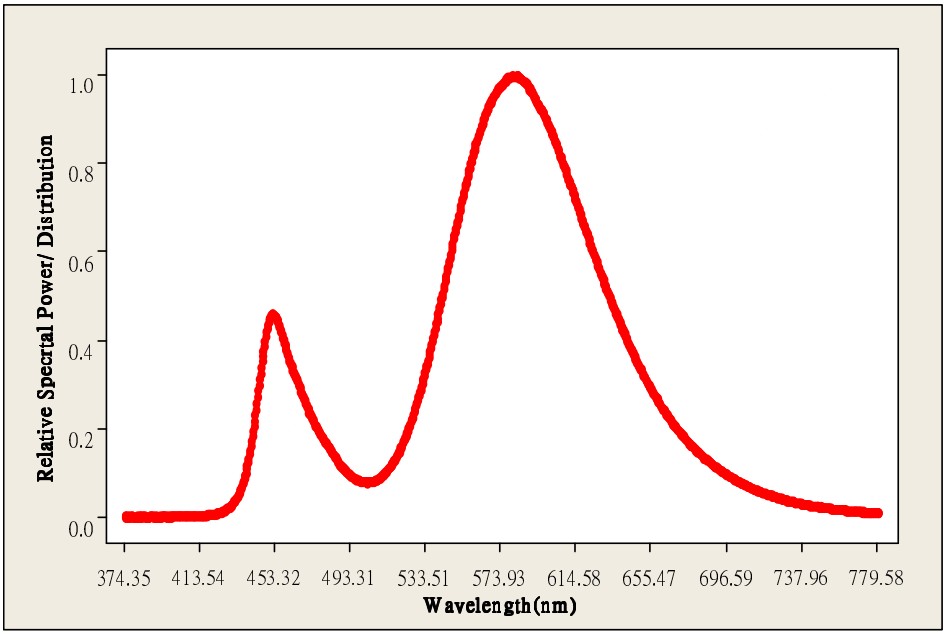


Figure 1c. Warm White Color Spectrum of Typical 3000K Part.

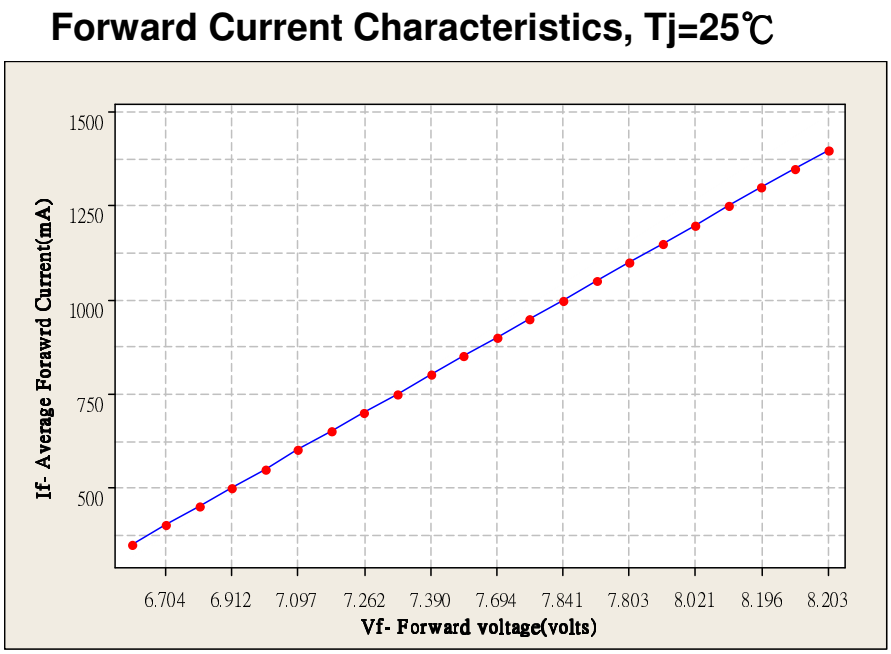


Fig 3a. Forward Current vs. Forward Voltage for White, Warm White, Blue and Green.

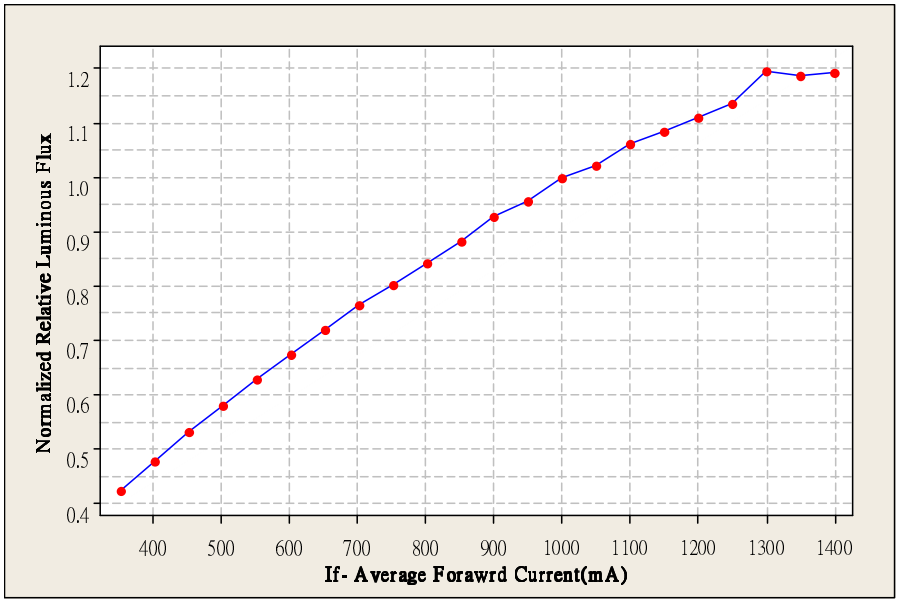
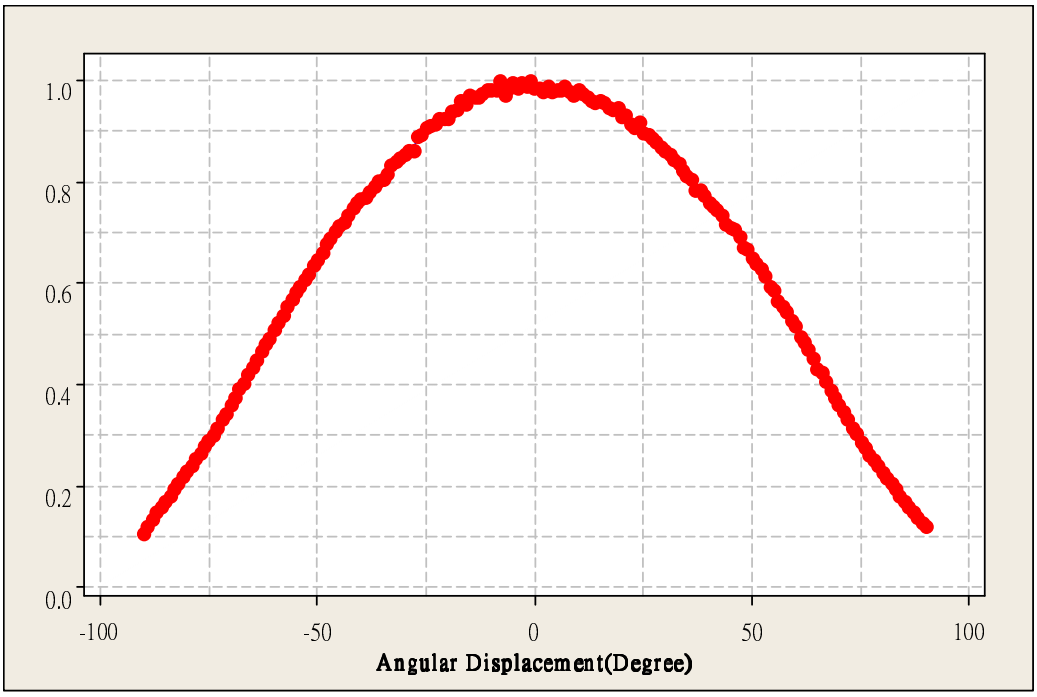


Fig 4a. Relative Luminous Flux vs. Forward Current for White, Warm White, Blue and Green at Tj=25℃ maintained.

Typical Representative spatial Radiation Pattern



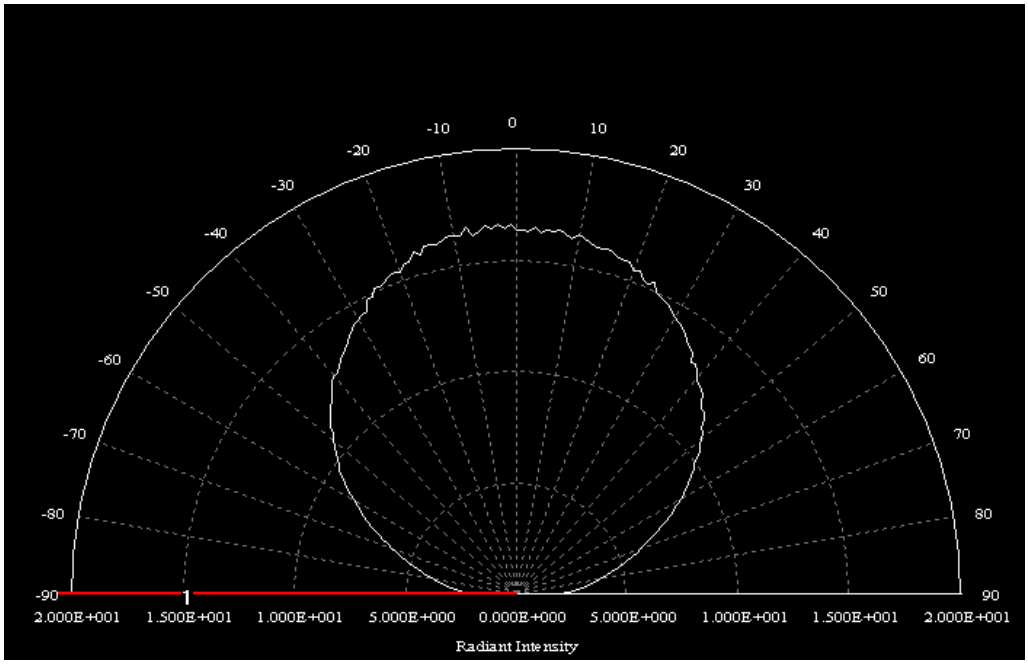
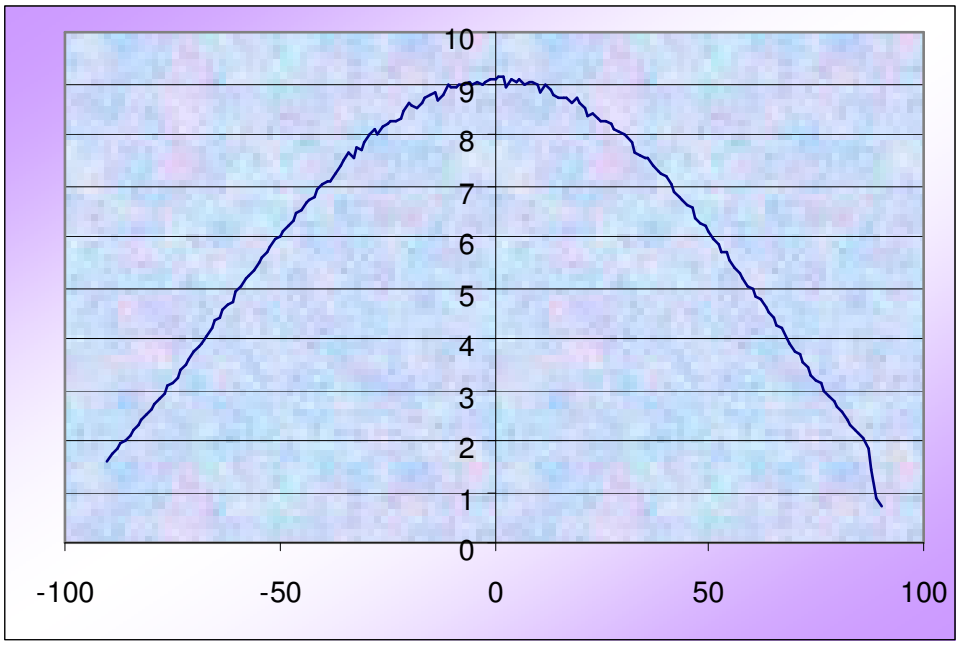


Fig. Typical Representative spatial Radiation Pattern for 6565 AL=125°.

Typical Representative spatial Radiation Pattern



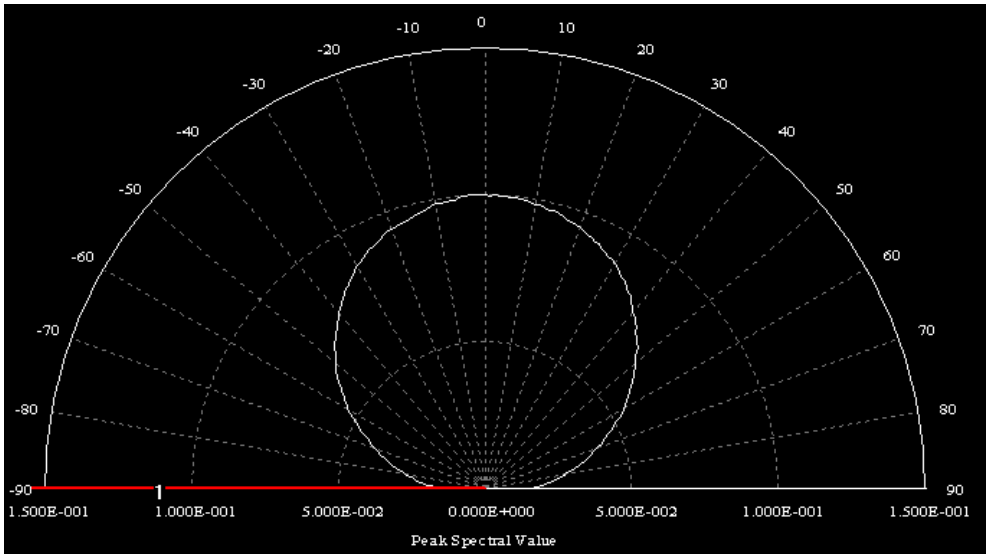


Fig. Typical Representative spatial Radiation Pattern for 6565 BL=135°.

Reliability Test Items and Results

Stress Test	Stress Conditions	Failure Criteria
Pre-con.	1. Sample before pre-con test measure by Integrating Sphere 2. Bake sample for 4hrs at 100℃. 3. Soak sample for 120hrs at 60℃ /60%RH (for MSL level 2a accelerated). 4. 3xIR at 260℃, ATS standard lead-free profile. 5. After pre-con test .appearance and measure by Integrating Sphere	1. Catastrophic failures causing the lamp to become non-functional.
T/S	1. Sample after pre-con test 2. -40/125℃ : 15 min dwell, <20 second transfer time. 3. Test end point : 200cycle 4. Product test point : 0, pre-con, 10cycle new product test point : 0, pre-con, 100, 200cycle 5. Appearance and measure by Integrating Sphere	1. Catastrophic failures causing the lamp to become non-functional.
RTOL	1. Sample after pre-con test 2. Temp =25℃, If=Average forward current 3. Test end point : 1000hrs 4. Test point : 0, pre-con, 168, 336, 504, 672, 840, 1000hrs 5. Appearance and measure by Integrating Sphere	1. Luminous flux degradation < 15% on any lamp. 2. Catastrophic failures causing the lamp to become non-functional.

Stress Test	Stress Conditions	Failure Criteria
HTOL	1. Sample after pre-con test 2. Temp =85℃, If= Average forward current, 3. Test end point : 1000hrs 4. Test point : 0, pre-con, 168, 336, 504, 672, 840, 1000hrs 5. Appearance and measure by Integrating Sphere	1. Luminous flux degradation < 15% on any lamp. 2. Catastrophic failures causing the lamp to become non-functional.
WHTOL	1. Sample after pre-con test 2. Temp =85℃, Humidity =85%RH, If= Average forward current, 3. Test end point : 1000hrs 4. Test point : 0, pre-con, 168, 336, 504, 672, 840, 1000hrs 5. Appearance and measure by Integrating Sphere	1. Luminous flux degradation < 20% on any lamp. 2. Catastrophic failures causing the lamp to become non-functional.
LTOL	1. Sample after pre-con test 2. Temp =-20℃, If= Average forward current, 3. Test end point : 1000hrs 4. Test point : 0, pre-con, 168, 336, 504, 672, 840, 1000hrs 5. Appearance and measure by Integrating Sphere	1. Luminous flux degradation < 15% on any lamp. 2. Catastrophic failures causing the lamp to become non-functional.

Precautions For Use

1. Over-current-proof

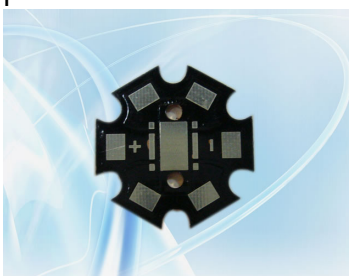
Customer must not use the device in reverse and should apply resistors for extra protection for prevent over current. Otherwise slight voltage shift may cause enormous current change and burn out failure would happen.

2. Storage

A. Do not open moisture barrier bag before the products ate ready to use.
B. Before openings the package, the LEDs should be kept at 30℃ or less and 90% RH or less.
C. The LEDs should be used within a year.
D. After opening the package, the LEDs should be kept at 30℃ or less and 70%RH or less.
E. The LEDs should be used within 168 hours (7 days) after opening the package.
F. If the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
G. Pre-curing treatment: 60±5℃ for 24 hours with tape and reel.

3. Thermal Management

A. For maintaining the high flux output and achieving reliability, 6565 series LED package should be mounted on a metal core printed circuit board (MCPCB) by using solder to get proper thermal connection to dissipate approximately 5W of thermal energy under 700mA operation.

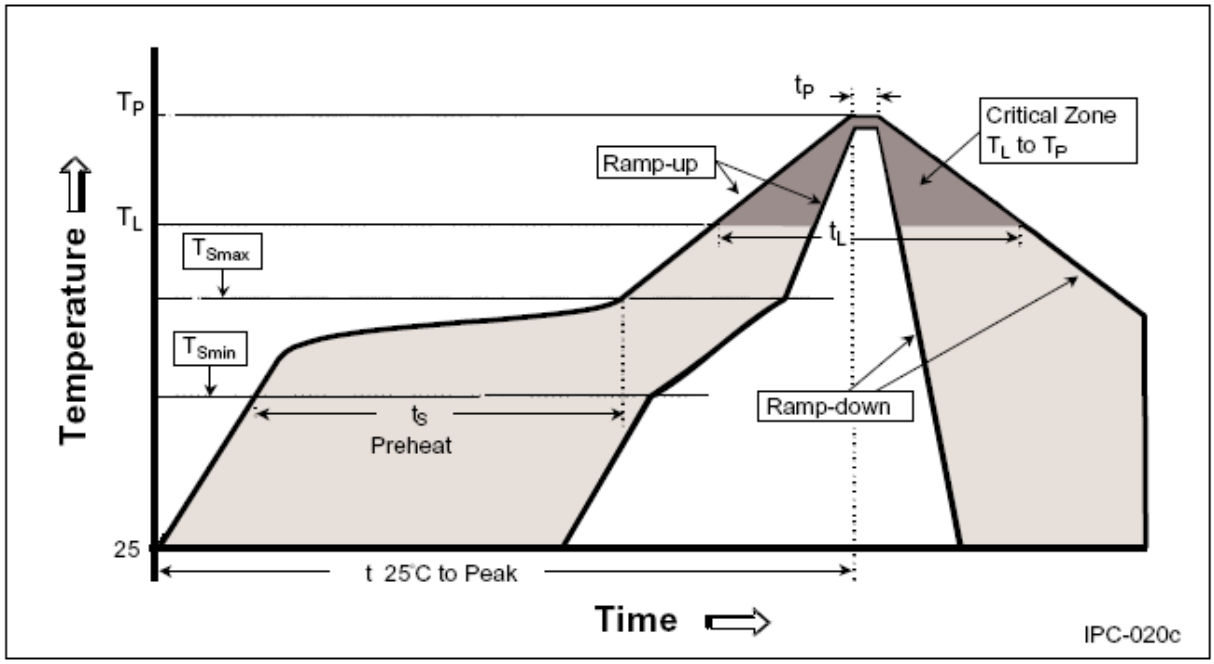


Copper-Bump MCPCB

B. Special thermal designs are recommended to take in outer heat sink design, such as 1 oz copper trace on Aluminum with thermal conductive adhesive.
C. Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LED lifetime will decrease critically.

4. Reflow Soldering Condition

Profile Feature	Sn-Pb Eutectic Assembly	Lead(Pb)- Free Assembly
Average Ramp-Up Rate (T_{Smax} to T_p)	3℃ / second max.	3℃ / second max.
Preheat - Temperature Min (T_{Smin}) - Temperature Max (T_{Smax}) - Time (t_{Smin} to $_{Smax}$)	 100℃ 150℃ 60-120 seconds	 150℃ 200℃ 60-180 seconds
Time maintained above: - Temperature (T_L) - Time (t_L)	 183℃ 60-150 seconds	 217℃ 60-150 seconds
Peak/Classification Temperature (T_P)	240℃	260℃
Time Within 5℃ of Actual Peak Temperature (t_P)	10-30 seconds	20-40 seconds
Ramp-Down Rate	6℃/seconds max.	6℃/seconds max.
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes max.



5. Soldering by using Hot Plate

A. Be careful because the damage of the product is often started when soldering.

B. When using hot plate to solder package on MCPCB, please following the instruction as below:

i. Put solder paste on MCPCB first, and make sure all solder pads are covered with solder paste.

ii. Put the package on right place and check the cathode pad is in right direction.

iii. Keep the temperature of hot plate lower then 230 degree C and then put MCPCB and package on it to solder. The process time MUST within 20 seconds. It will prevent from any damage.

iv. Take the MCPCB out and cool it down in room temperature. Using power supply to check the element and ignite it.

C. If the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

D. Pre-curing treatment: 60±5℃ for 24 hours with tape and reel.