

**Data Sheets of AVA Technology  
SMD Hi-Power White LED**

**Model: T6W6C**

**AVA Technology Co.**

**2640 S. Myrtle Ave. Suite 6**

**Monrovia, CA 91016**

**P: 626-574-7726**

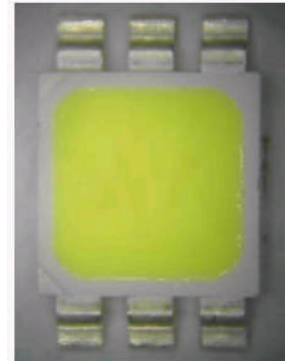
**F: 626-574-7732**

**<http://www.led4light.com>**

## Top View Hi-Power White LED with Reflector

### 1. FEATURES

- High intensity with small package, ideal for backlighting
- Wide viewing angle (120° )
- Package Outline (L×W×H)=7.4×5.0×1.3 mm
- Technology: InGaN
- Color coordinates CIE(x,y): (0.31,0.31) according to CIE 1931.
- Suitable for all SMT assembly methods
- Operating Power Consumption : 0.80W
- Mount on MCPCB have good Thermal Dissipation and Excellent Life
- Suitable for all soldering methods
- Delivery on 12mm tape reels
- Suitable for Lead-free process



### 2. APPLICATIONS

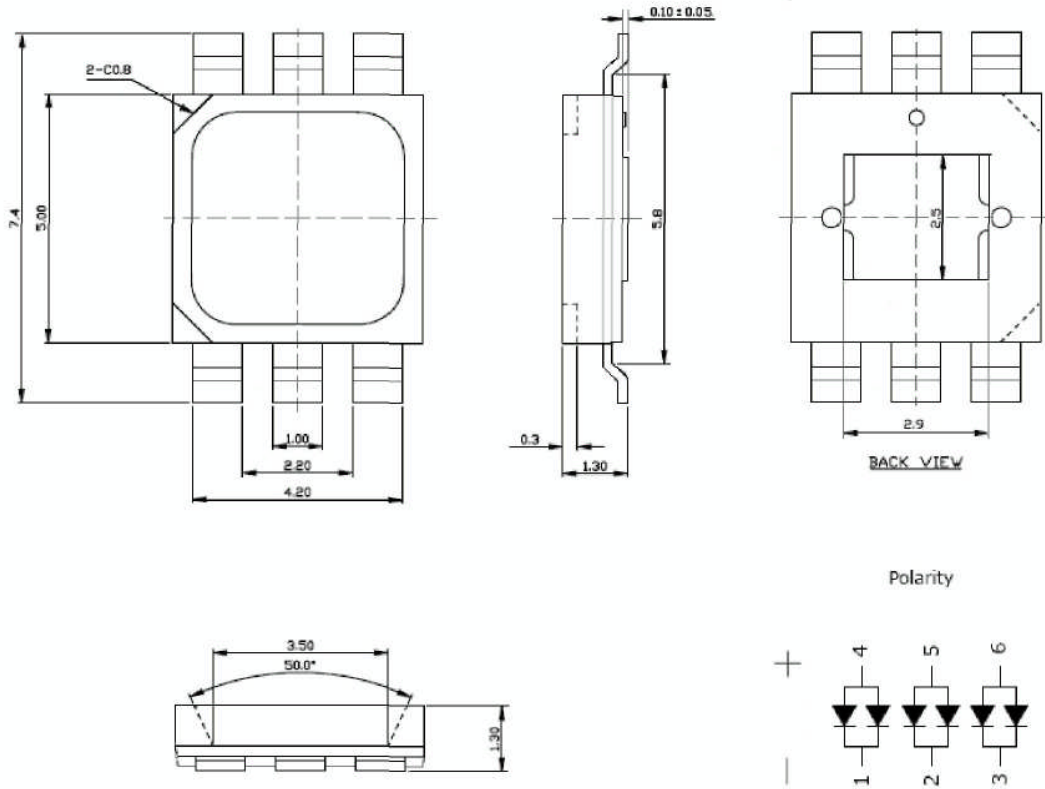
- Automotive: indoor/outdoor lighting.
- Signal and symbol lightings
- Backlighting (Large LCD.....)
- All applications in notice high intensities are required
- Strobe Light
- Channel Letter
- Decorative Light
- General Lighting

### 3. DEVICES PACKAGE

ITEM	MATERIALS
Package	Heat-Resistant Polymer
Encapsulating	Heat Resistance Resin
Electrodes	Ag Plating Copper Alloy

Type	Color of Emission	Color of the Light Emitting Area	Luminous intensity I <sub>v</sub> (mcd) I <sub>F</sub> =210mA
T6W6C	White	Colored	8400 ~20000

4. OUTLINE DIMENSION:



Note:

1. Unit: mm

2. Tolerance: Dimension  $\pm 0.1$  / Angle  $\pm 0.5^\circ$

**5. ABSOLUTE MAXIMUM RATINGS ( T<sub>A</sub>=25°C )**

Parameter	Symbol	Absolute Max. Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	240	mA
Operating Temperature	T <sub>opr</sub>	-30 ~ +65	°C
Storage Temperature	T <sub>stg</sub>	-40~+100	°C
Soldering Temperature	T <sub>sol</sub>	260 (for 5 sec)	°C
Power Consumption	P <sub>D</sub>	1.0 (6 chips ON)	W
Peak Forward Current (Duty 1/10 @ 1KHz)	I <sub>F(peak)</sub>	480 (6 chips ON)	mA
Junction temperature	T <sub>j</sub>	120	°C
Thermal Resistance (Junction to ambient)	R <sub>th,JA</sub>	60	°C/W

**6. ELECTRONIC OPTICAL CHARACTERISTICS**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Chromaticity coordinate x acc. To CIE 1931	x	I <sub>F</sub> =210mA	—	0.31	...	—
Chromaticity coordinate y acc. To CIE 1931	y	I <sub>F</sub> =210mA	—	0.31	—	...
Correlated Color Temperature	CCT	I <sub>F</sub> =210mA	—	6900	—	K
Viewing Angle	2θ <sub>1/2</sub>	I <sub>F</sub> =210mA	—	120	...	Degree
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =210mA	—	3.40	3.80	V
Leakage Current	I <sub>R</sub>	V <sub>R</sub> =-5V	—	—	50	μA

**7. LUMINOUS INTENSITY GROUPS:**

Luminous intensity group	Measurement condition	Luminous intensity Iv(mcd)
X2	I <sub>F</sub> = 210 mA	15000-20000
X1		12000-15000
W9		10000-12000
W8		8400-10000

\*Luminous intensity group includes 4 groups W8 to X2.

\*Luminous intensity is tested at a current pulse duration of 25ms and a tolerance of  $\pm 10\%$

**8. CHROMATICITY COORDINATES RANKS :**

Forward Current, IF=20mA							
Rank	CIE		CCT(°K)	Rank	CIE		CCT(°K)
	x	y			x	y	
a31	0.2640	0.2670	11500-15000	b51	0.2870	0.2950	7600-9000
	0.2690	0.2610			0.26900	0.2885	
	0.2790	0.2760			0.3020	0.3000	
	0.2760	0.2810			0.3000	0.3080	
a32	0.2690	0.2610		b52 (b74)	0.26900	0.2885	
	0.2770	0.2520			0.2950	0.2785	
	0.2850	0.2665			0.3060	0.2875	
	0.2790	0.2760			0.3020	0.3000	
a36	0.2770	0.2535		b73	0.2950	0.2785	
	0.2840	0.2460			0.3000	0.2690	
	0.2910	0.2570			0.3080	0.2790	
	0.2850	0.2665			0.3060	0.2875	
a33 (b71)	0.2790	0.2760	9000-11500	b33	0.2980	0.3150	7000-7600
	0.2850	0.2665			0.3000	0.3080	
	0.2950	0.2785			0.3070	0.3150	
	0.2900	0.2885			0.3055	0.3220	
a34	0.2760	0.2810		b34	0.2960	0.3210	
	0.2790	0.2760			0.2980	0.3150	
	0.2900	0.2885			0.3055	0.3220	
	0.2870	0.2950			0.3040	0.3300	
b72	0.2850	0.2665		b53 (b81)	0.3020	0.3000	
	0.2910	0.2570			0.3060	0.2875	
	0.3000	0.2690			0.3110	0.2940	
	0.2950	0.2785			0.3085	0.3075	
b31	0.2830	0.3070	7600-9000	b54	0.30	0.3080	
	0.2853	0.3000			0.3000	0.3000	
	0.2980	0.3150			0.3085	0.3075	
	0.2960	0.3210			0.3070	0.3150	
b32	0.2853	0.30600		b82	0.3060	0.2875	
	0.2870	0.2950			0.3080	0.2790	
	0.3000	0.3080			0.3130	0.2850	
	0.2980	0.3150			0.3110	0.2940	

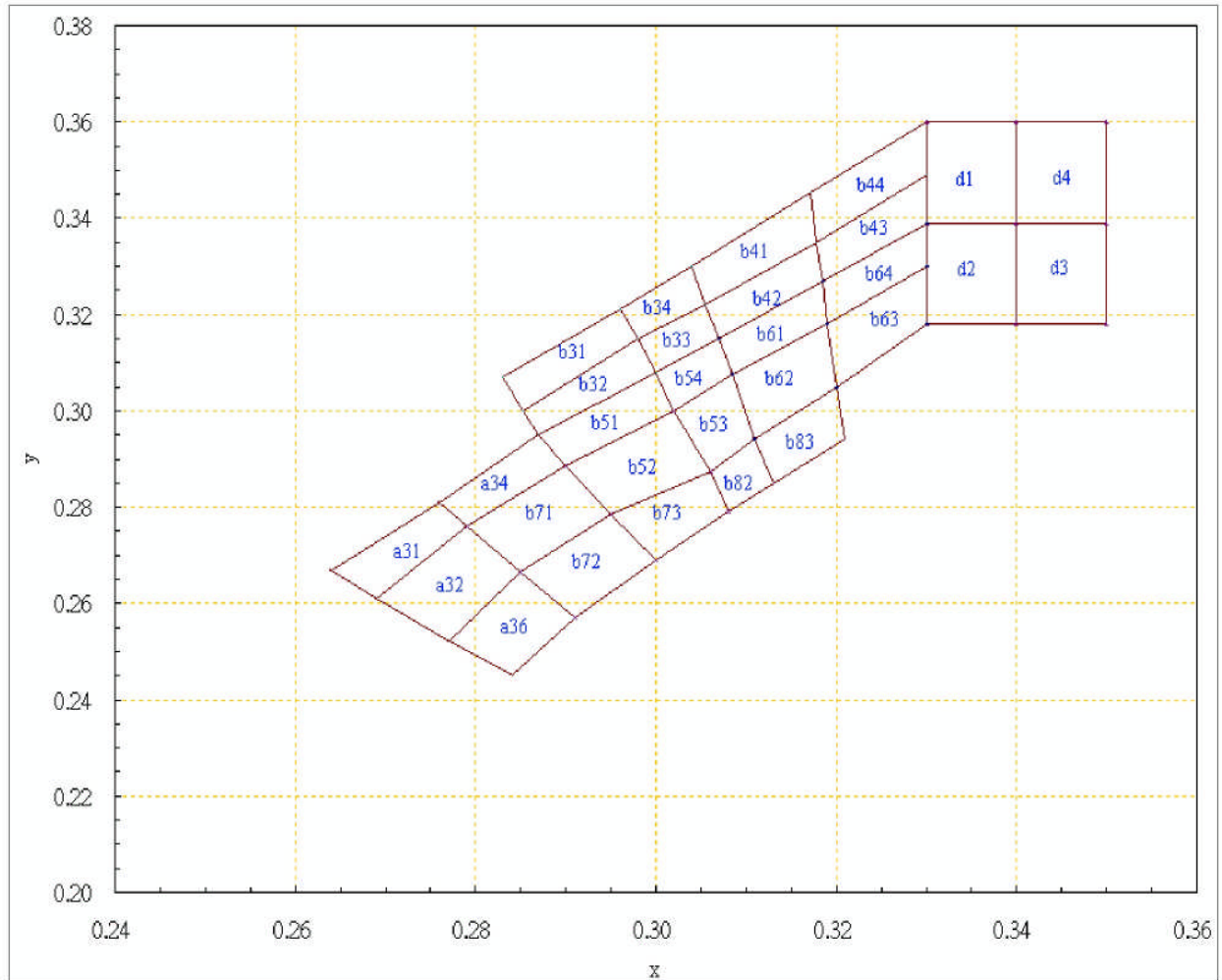
Forward Current, IF=210mA							
Rank	CIE		CCT(°K)	Rank	CIE		CCT(°K)
	x	y			x	y	
b41	0.3040	0.3300	6000-7000	b63	0.3190	0.3180	5000-6500
	0.3055	0.3220			0.3050	0.3050	
	0.3177	0.3350			0.3180	0.3180	
	0.3172	0.3452			0.3300	0.3300	
b42	0.3055	0.3220		b64	0.3185	0.3270	
	0.3070	0.3150			0.3190	0.3180	
	0.3185	0.3270			0.3300	0.3300	
	0.3177	0.3350			0.3300	0.3390	
b61	0.3070	0.3150		d1	0.3600	0.3600	4700-5500
	0.3085	0.3075			0.3390	0.3390	
	0.3190	0.3180			0.3400	0.3390	
	0.3185	0.3270			0.3400	0.3600	
b62 (b84)	0.3085	0.3075	6000-7000	d2	0.3390	0.3390	
	0.3110	0.2940			0.3300	0.3180	
	0.3200	0.3050			0.3400	0.3180	
	0.3190	0.3180			0.3400	0.3390	
b83	0.3110	0.2940	d3	0.3390	0.3390		
	0.3130	0.2850		0.3400	0.3180		
	0.3210	0.2940		0.3500	0.3180		
	0.3200	0.3050		0.3500	0.3390		
b43	0.3177	0.3350	5000-6500	d4	0.3400	0.3600	
	0.3185	0.3270			0.3400	0.3390	
	0.3300	0.3390			0.3500	0.3390	
	0.3300	0.3490			0.3500	0.3600	
b44	0.3172	0.3452					
	0.3177	0.3350					
	0.3300	0.3490					
	0.3300	0.3600					

\* Tolerance of the chromaticity coordinate is  $\pm 0.007$

\* CCT (Correlated Color Temperature) Tolerance is  $\pm 300$  K

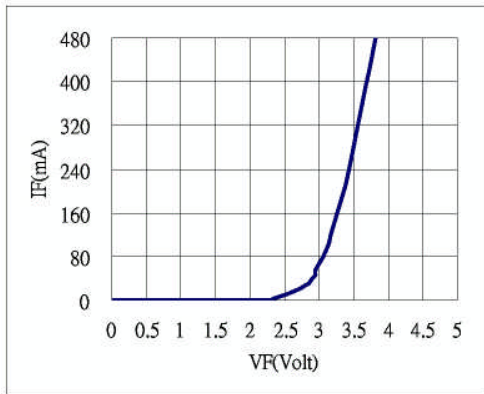
**9. TYPICAL ELECTRO-OPTICAL CHATACTERISTIC CURVES:**

\* Chromaticity Coordinates (CIE 1931 system)

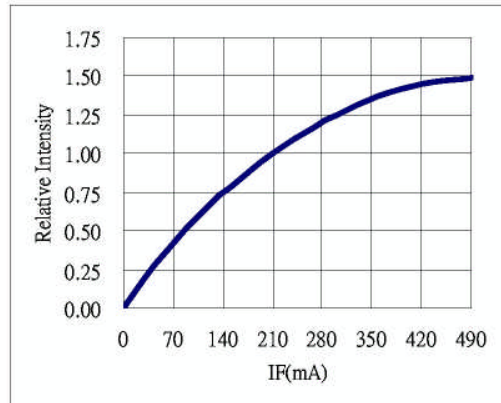




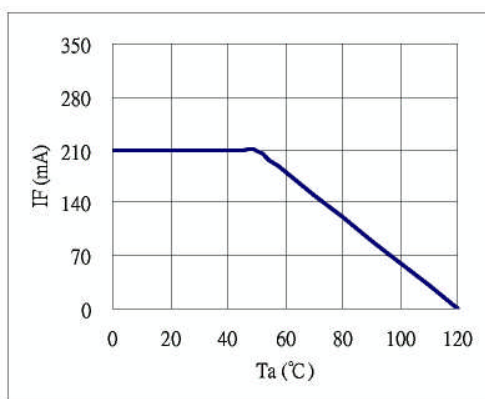
**\* Forward Voltage vs. Forward Current @25°C**



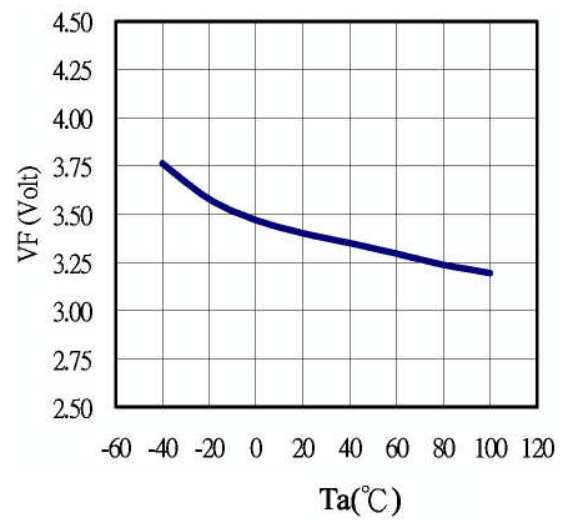
**Forward Current vs. Relative Luminosity @25°C**



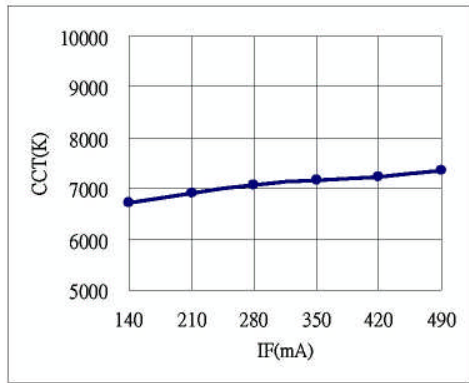
**\* Ambient Temperature vs. Allowable Forward Current**



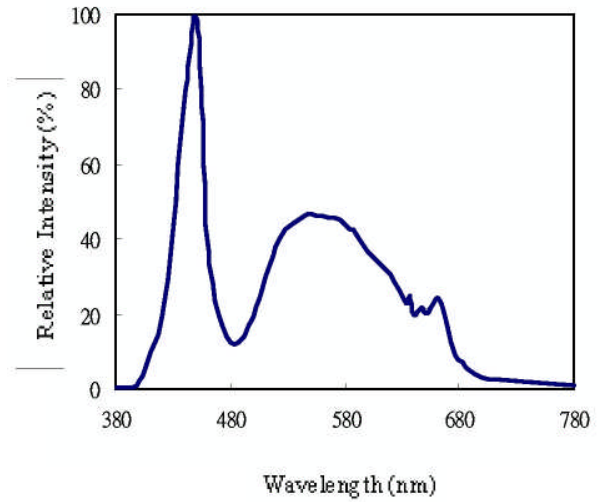
**\* Ambient Temperature vs. Forward Voltage @20mA**



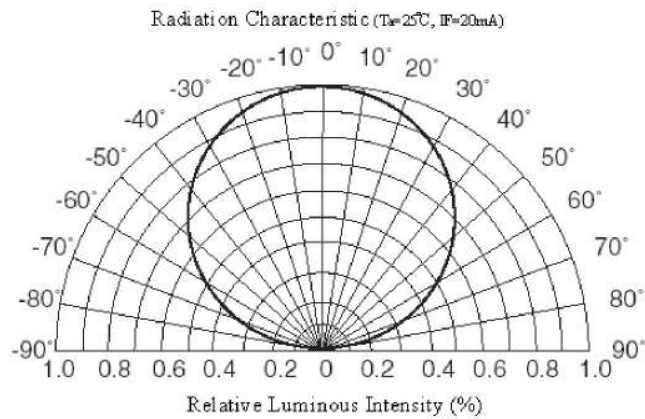
**\* Forward Current vs. Correlated Color Temperature @ 25°C**



**\* Spectrum @ 210mA, 25°C**



**\* Radiation Characteristic (@25°C, 210mA)**



**10. RELIABILITY PLAN:**

\* The reliability of products shall be satisfied with items listed below.

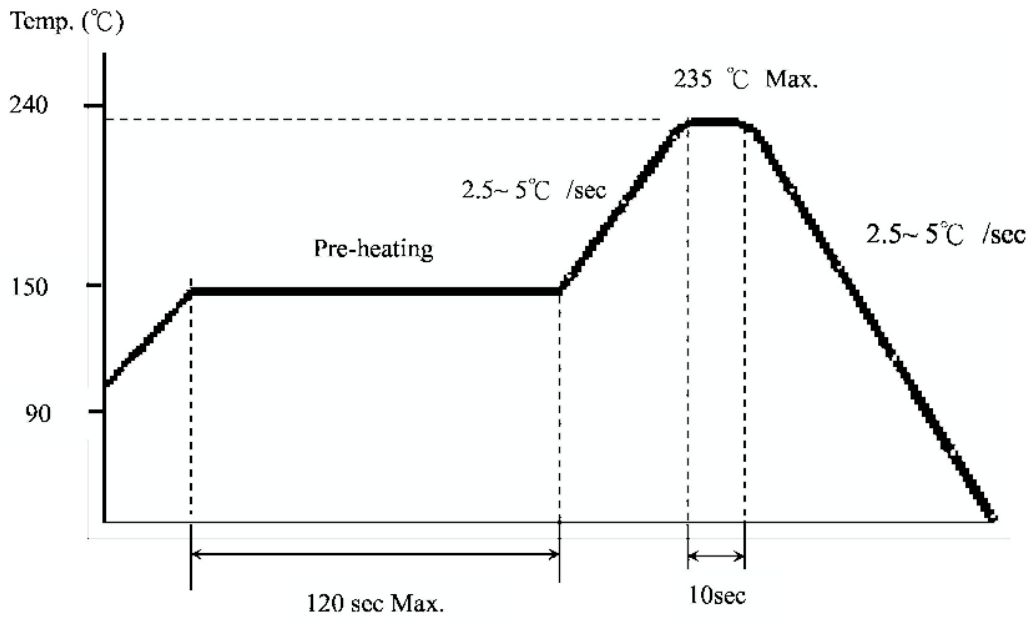
Confidence Level: 90 % , LTPD : 10 %

No	Test Item	Description & Condition		Sample size	Ac/Re	Failure Criteria
1	Solderability	Tsld=235±5°C,10sec,	1 time	15	0/1	L: Lower Spec. Level  U: Upper Spec. Level
2	Room Temperature operating	Ta = 25 °C If = 210 mA	1000 hrs	15	0/1	
3	Room Temperature operating	Ta = 25 °C If = 300 mA	500 hrs	15	0/1	
4	Low Temperature Storage	Ta = -40°C	1000 hrs	15	0/1	
5	High Temperature Storage	Ta=100°C	1000 hrs	15	0/1	
6	Temperature Cycle	-40°C ~ 25°C ~ 100°C ~ 25 °C 30min 5min 30min 5 min	300 cycles	15	0/1	
7	High Humidity Heat	Ta = 60°C RH=90% If = 210 mA	500 hrs	15	0/1	

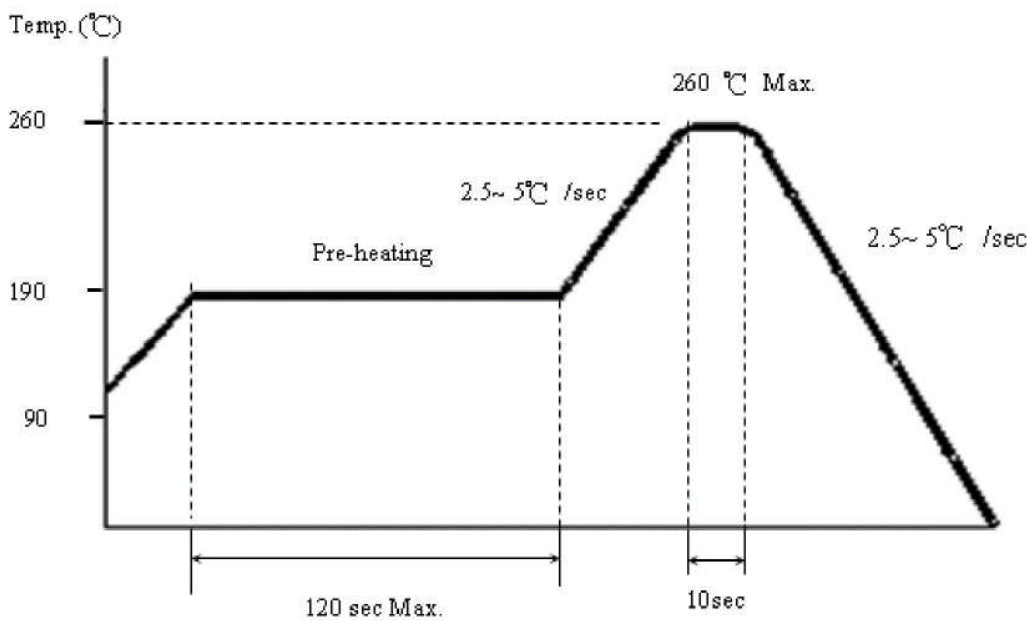
**11. SOLDERING CONDITIONS:**

**(1) Recommended Re-flow profile**

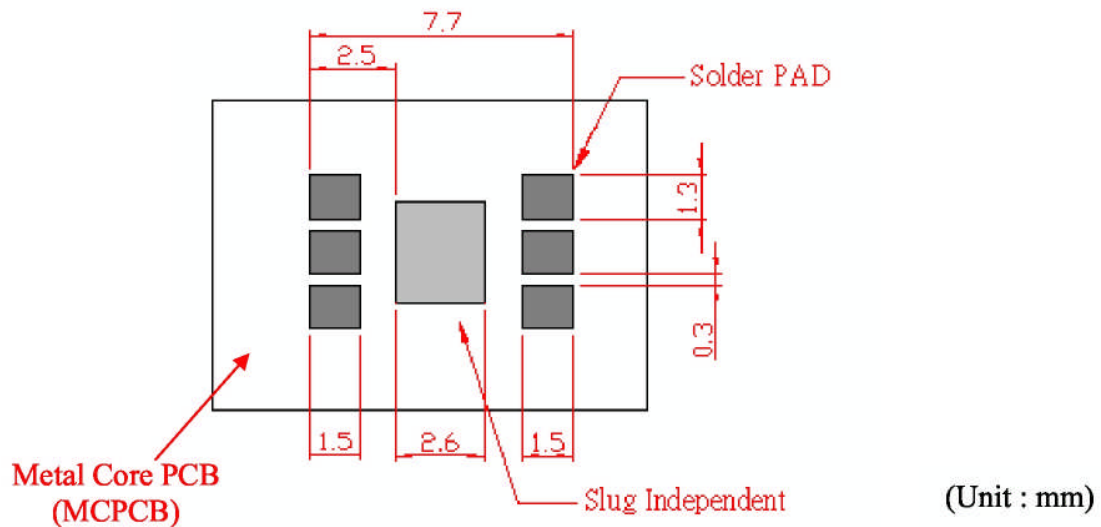
**(A) Lead Solder Profile**



**(B) Lead-free Solder Profile**



### Recommended Soldering Pad



- (2) Re-flow soldering should not be done more than two times.
- (3) It is recommended that the user use the nitrogen reflow method.
- (4) When soldering, don't put stress on the LEDs during heating.
- (5) After soldering, don't warp the circuit board.
- (6) It is recommended that isopropyl alcohol (IPA) be used as a solvent for cleaning the LEDs.

## 12. CAUTIONS:

### (1) Storage

- Before opening the package :

The LEDs should be kept at 30°C or less and 30%RH~85%RH. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with desiccant (Silica gel) is recommended.

- After opening the package :

The LEDs should be kept at 30°C or less and 30%RH~70%RH. The LEDs should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, they should be stored in moisture proof packages, such as sealed containers with packages of moisture desiccant (Silica gel), or reseal the moisture proof bag again. If the moisture desiccant (Silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 24 hours at 60°C on tap and reel, 3 hours at 125°C have no reel&tap.

Please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration might lower solderability or might effect on optical characteristics. -Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

- Moisture Proof package

When moisture is absorbed into the SMT package it may vaporize and expand during soldering. There is a possibility that this can cause exfoliation of the contacts and damage to the optical characteristics of the LEDs. For this reason, the moisture proof package is used to keep moisture to a minimum in the package. A package of a moisture desiccant (silica gel) is inserted into the moisture proof bag- The silica gel changes its color from blue to pink as it absorbs moisture.

(2) Static Electricity

- Static electricity or surge voltage damages the LEDs. It is recommended that a wrist band or an anti-electrostatic glove and shoe be used when handling the LEDs.
- All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.
- when inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to End static-damaged LEDs by a light-on test or a VF test at a lower current (below 1 mA).
- Damaged LEDs will show some unusual characteristics such as the leak current remarkably increases, the forward voltage becomes lower, or the LEDs do not light at the low current.

(3) Heat Generation

- Please consider the heat generation of the LED when making the system design that it's very importance. The coefficient of temperature increase per input electric power is effected by the thermal resistance of the circuit board and density of LED placement on the board, and other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.
- The operating current should be decided after considering the ambient maximum temperature of LEDs.

(4) Others

- Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.
- The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly for more than a few seconds. Flashing lights have been known to cause discomfort in people; you can prevent this by taking precautions during use. Also, people should be cautious when using equipment that has had LEDs incorporated into it.