

# EREADA RED LIGHT LEDs SPECIFICATIONS

<b>Customer</b>	
<b>Item</b>	<b>RED LED PKG</b>
<b>PKG Type</b>	<b>5.4X5.0X1.6mm (LXWXH)</b>
<b>MODEL</b>	<b>EC-RE54A3NR-06</b>
<b>Part Number</b>	
<b>Revision</b>	

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# 5450 0.2W RED LED PKG

## 1. Description

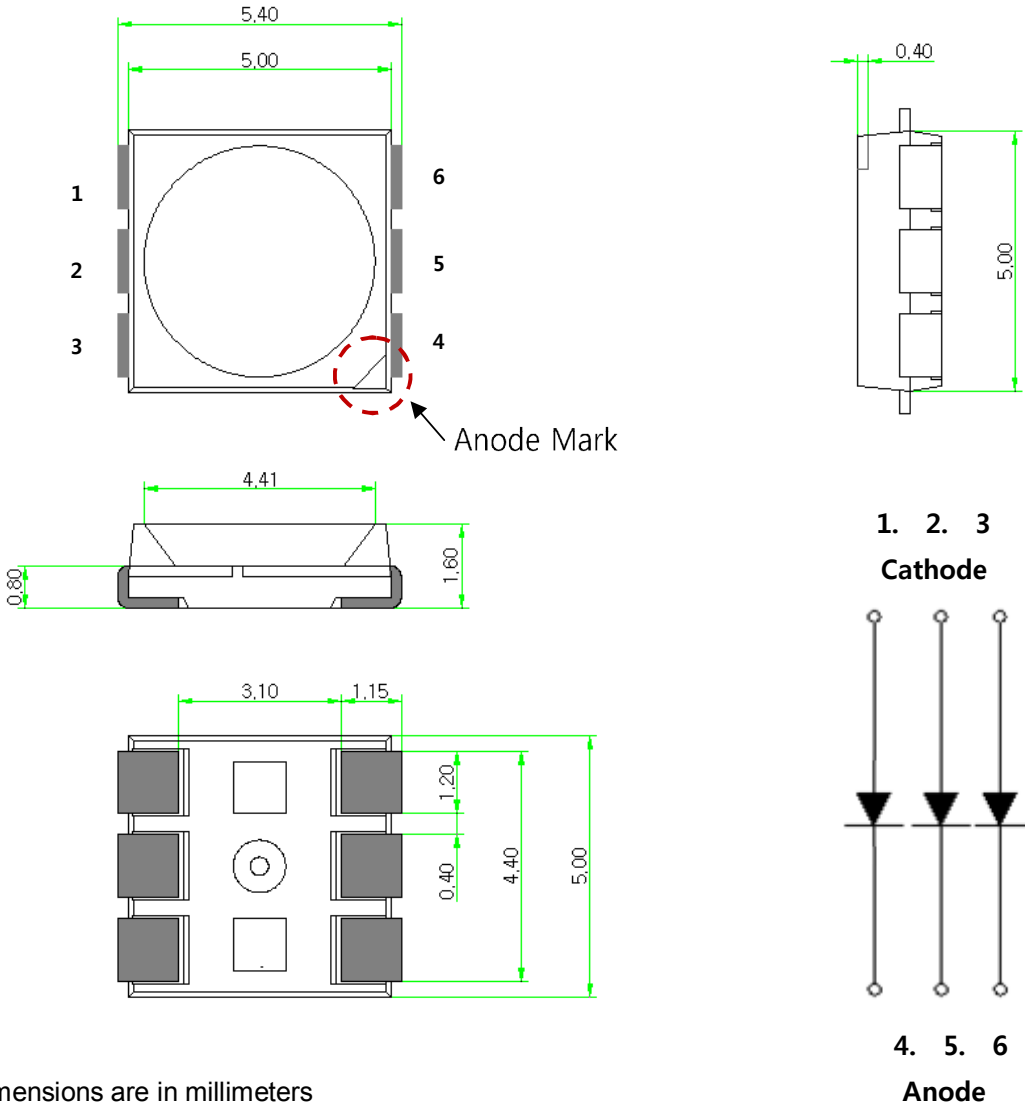
EnerCore provides highly bright and efficient LED Packages with our customers.

Our core technologies of LED Packages are specialized in designing LED patterns and minimizing loss of efficiency to integrate with LED Lighting.

Outstanding thermal conductivity with high luminous efficiency based on ceramic substrate will provide highest level of luminous flux output and easiest thermal management.

Furthermore, EnerCore can give our customers the ideal solution of convenience to design by themselves.

## 2. Outline Dimension



Note

All dimensions are in millimeters

Tolerance:  $\pm 0.1\text{mm}$

### 3. Specification

#### 3-1. Absolute Maximum Ratings

Characteristic	Symbol	Ratings	Unit
Power Dissipation	$P_d$	220	mW
Forward Current <sub>[1]</sub>	$I_F$	60 (90)	mA
Peak Forward Current	$I_{FP}$	300	mA
Reverse Voltage	$V_R$	5	V
Operating Temperature	$T_{op}$	-30°C ~ + 85	°C
Storage Temperature	$T_{stg}$	-40°C ~ +100	°C
Junction Temperature	$T_j$	125	°C

#### 3-2. Electrical-Optical Characteristics at $I_F = 60\text{mA}$ , $T_A = 25\text{ °C}$

Characteristics	Symbol	Min.	Typ.	Max	Unit
Luminous Intensity [2]	$I_v$	800	1,200	1,400	mcd
Forward Voltage [4]	$V_F$	1.8	-	2.3	V
Reverse Current	$I_R$	-	-	1.0	$\mu\text{A}$
Peak Wavelength <sub>[4]</sub>	$\lambda_p$	620	-	670	nm
Viewing Angle (FWHM)	$\Theta_{1/2}$	-	120	-	Deg

Note

[1] Duty Ratio  $\leq 1/10$ , Pulse Width  $\leq 100\text{ms}$

[2] Luminous Intensity measurement tolerance:  $\pm 10\%$

[3] Forward voltage measurement tolerance:  $\pm 0.1$

[4] Peak Wavelength: 620 ~ 670nm

## 4. Sorting Table

### Red LED PKG Sorting Table

Item	Symbol	Rank	Min.	Max	Condition	Unit
Luminous Intensity	Iv	A	800	1,000	IF=60mA	mcd
		B	1,000	1,200		
		C	1,200	1,400		
Forward Voltage	Vf	V1	1.8	1.9	IF=60mA	V
		V2	1.9	2.0		
		V3	2.0	2.1		
		V4	2.1	2.2		
		V5	2.2	2.3		
		V6	2.3	2.4		
Peak Wavelength	$\lambda P$	62A	620	625	IF=60mA	nm
		62B	625	630		
		63A	630	635		
		63B	635	640		
		64A	640	645		
		64B	645	650		
		65A	650	655		
		65B	655	660		
		66A	660	665		
		66B	665	670		

Note

[1] measurement tolerance :  $\pm 5\%$

[2] measurement tolerance :  $\pm 0.05V$

## 5. Part Numbering

EC - RE - 54 - A - 3 - N - R - 06 - 000



1) ENENRCORE Lighting LED

2) LED Color

-. CW: [Cool White] / PW:[Pure White] / NW:[Natural White] / WW: [Warm White]

FC: Full color / RE: [Red] / BL : [Blue] / GR : [Green] / YE : [Yellow]

3) Package Dimension

-. 35 = (3528 1.9T) / 50 = (5050 1.2T) / 54 = (5450 1.6T) / 56 = (5630 0.9T)

4) Version: Internal code

5) Chip Polarity

-. 1 = 1chip / 2 = 2chip / 3 = 3chip

6) ESD Protect solution

-. Z =Zener diode / N = No Zener diode

7) Color rendering [CRI]

-. L = 70 ~ 80Ra, M = 80 ~ 90Ra, H = 94 ~ 98Ra

F: Full color / R: [Red] / BL: [Blue] / G : [Green] / Y : [Yellow]

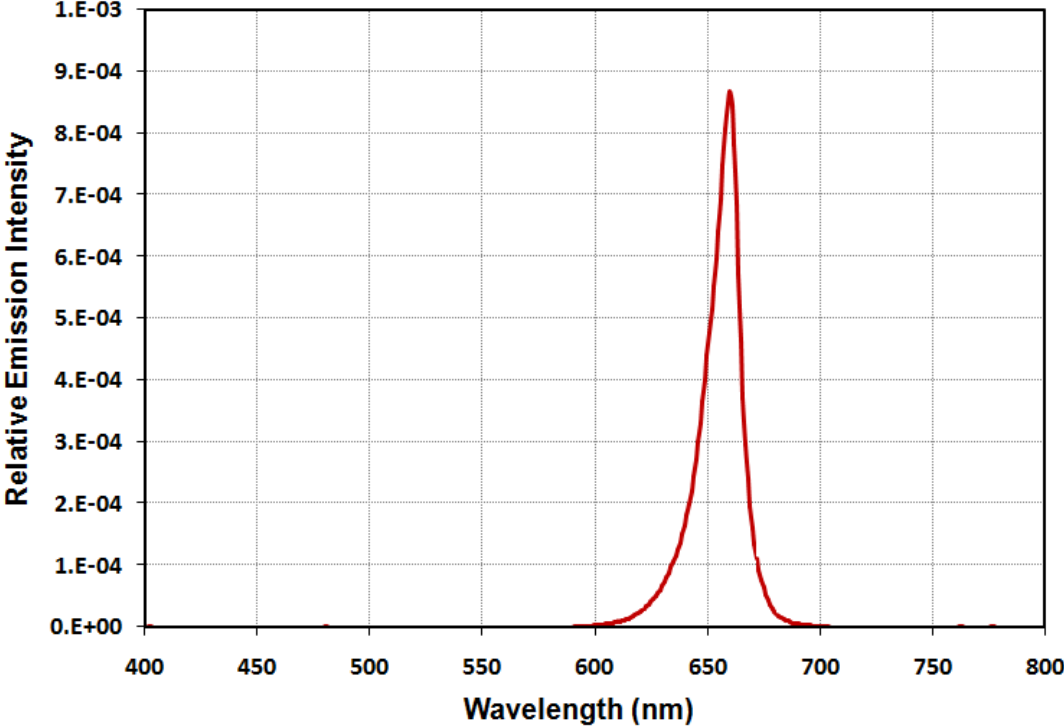
8) Forward Current

-. 06 = 60mA, 09 = 90mA, 12 = 120mA, 15 = 150mA, 35 = 350mA

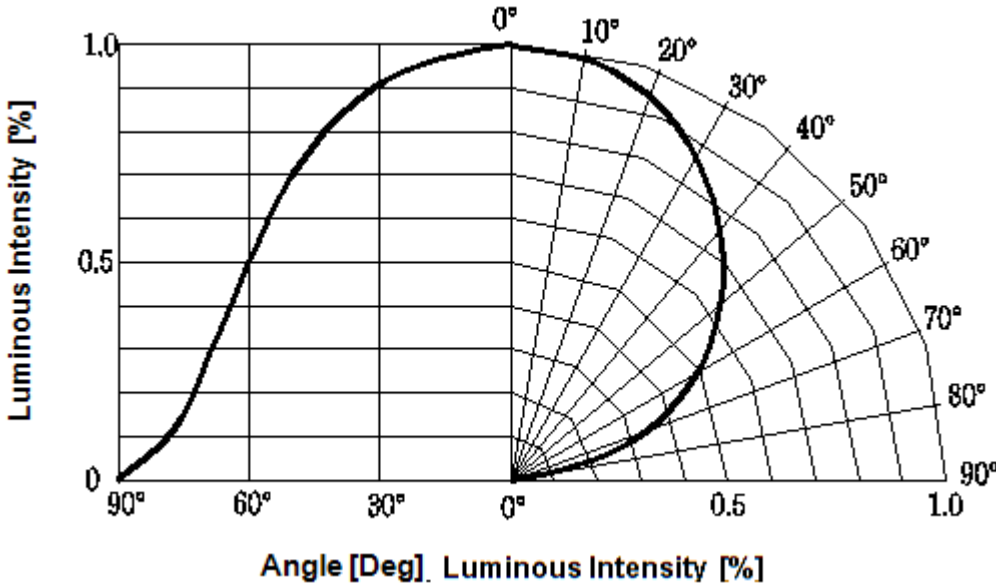
9) Special Rank

### 6. Characteristic Diagrams

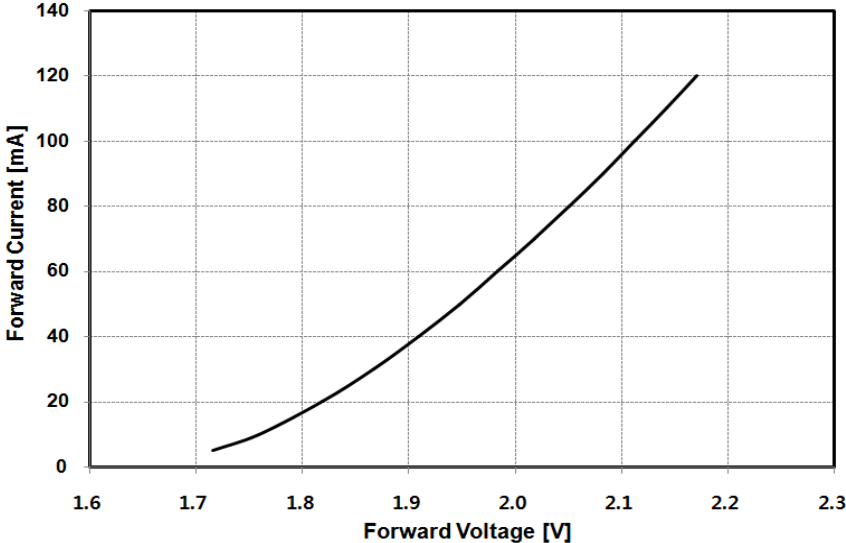
6-1. Relative Emission Intensity vs. Wavelength, based on  $I_F = 60\text{mA}$ ,  $T_A = 25^\circ\text{C}$



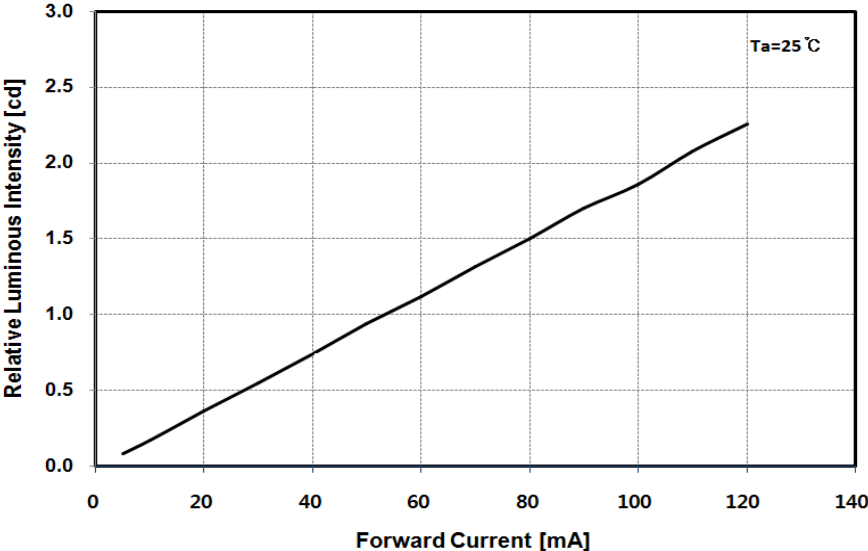
6-2. Luminous Intensity vs. Angle Distribution, based on  $I_F = 60\text{mA}$ ,  $T_A = 25^\circ\text{C}$



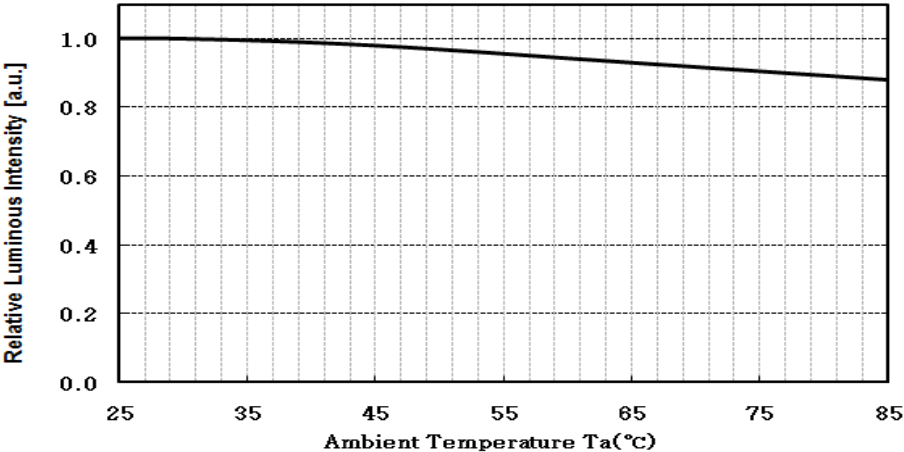
6-3. Forward Current vs Forward Voltage ( $I_F$ - $V_F$ )



6-4. Relative Luminous Intensity vs Forward Current ( $I_m$ - $I_F$ )

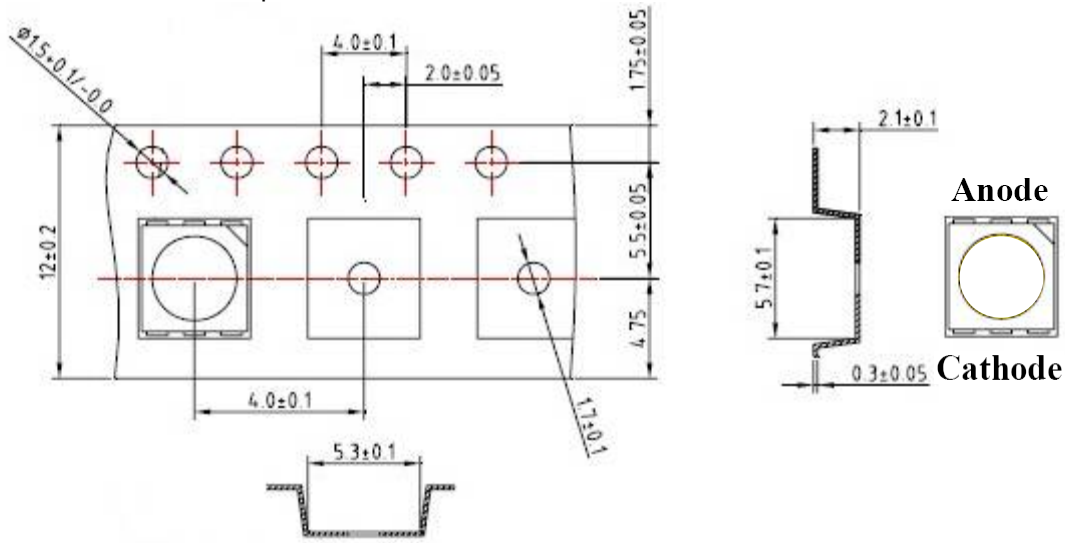


6-5. Relative Light Output vs Ambient Temperature



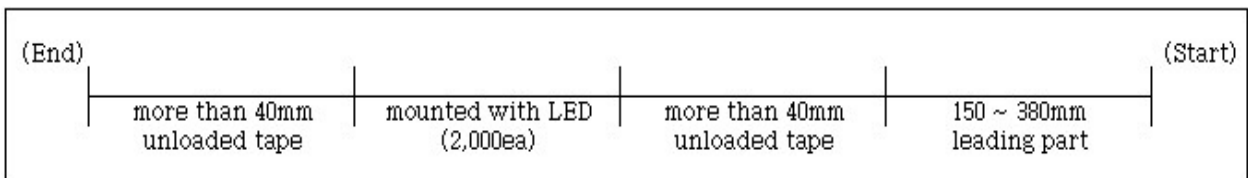
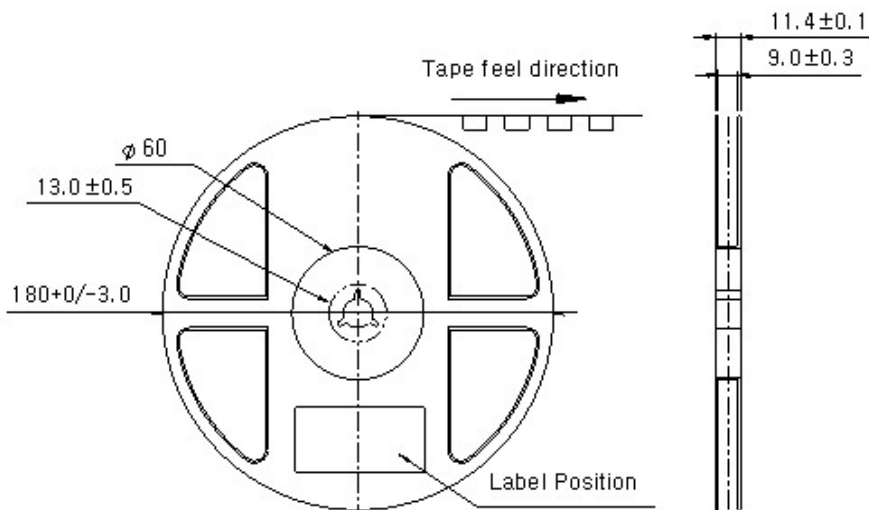
## 7. Packing Specifications

### (1) Dimensions of Carrier Tape



Material: PS, Conductivity:  $10^9 \Omega \sim 10^{12} \Omega$

### (2) Dimensions of Reel



Material: PS, Conductivity:  $10^4 \Omega \sim 10^5 \Omega$



(3) Packing

Label Structure 650mm x 350mm

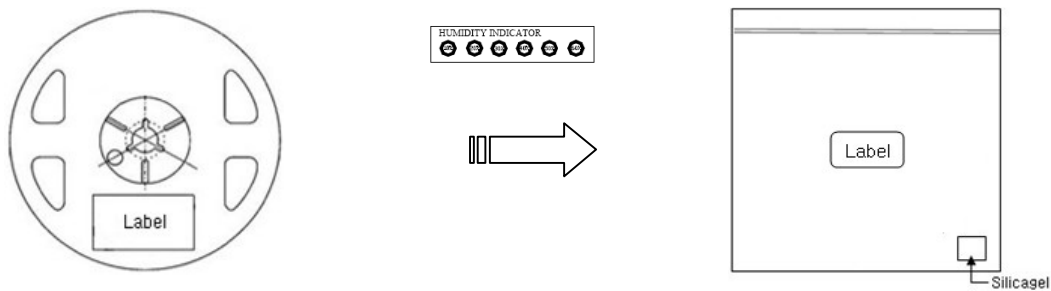
1) Reel

- ① Model
- ② Lot No
- ③ Quantity per Reel
- ④ Production Date
- ⑤ Rank –

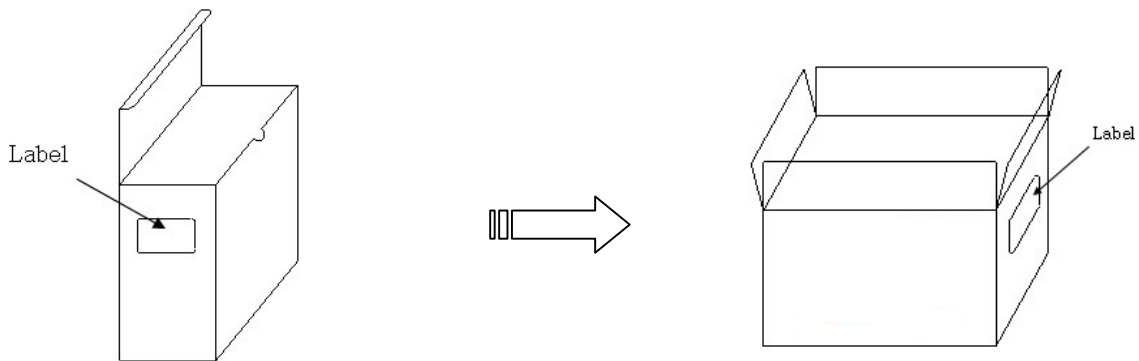
■: Vf / ◆: Wd & CIE / ○: Iv

2) Reel & Shield Bag

Each reel is sealed in an antistatic shielding bag with silica gel.



3) Inner Box & Outer Box



Each reel is sealed in an antistatic shielding bag with silica gel.

Packing unit	Description		
	Quantity	shielding bag	Inner carton box
1Reel		10Reel	6Box
1,000pcs		10,000pcs	60,000pcs
Size (mm)	210(W)×225(L)	220(W)×170(L)×270(H)	535(W)×465(L)×330(H)

## 8. Soldering Profile

### Solder conditions

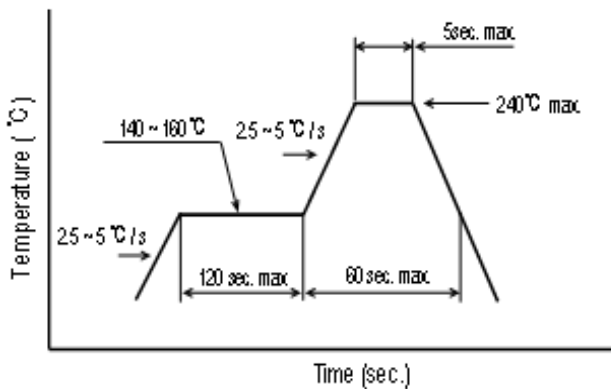
Reflow Soldering			Manual Soldering		
	Lead solder	Lead-free [1]		Lead Solder	Lead-free <sub>[1]</sub>
Pre-heating	140 ~ 160 °C	180~200°C	Temperature	max. 300°C	max. 350°C.
Pre-heat time	60 ~ 120 sec.	120 sec.	Time	max. 3 sec.	max. 3 sec.
Peak temperature	max. 240°C	max. 260°C	No multiple soldering allowed		
Soldering time	max. 5 sec.	max. 5 sec.			

\*After reflow soldering, rapid cooling should be avoided.

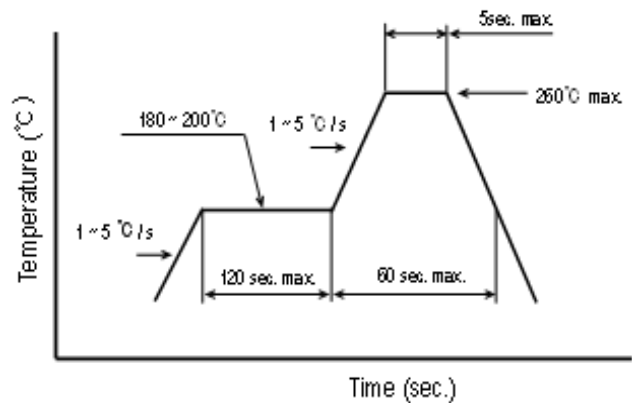
[1] : N2 reflow is recommended

### Temperature profile

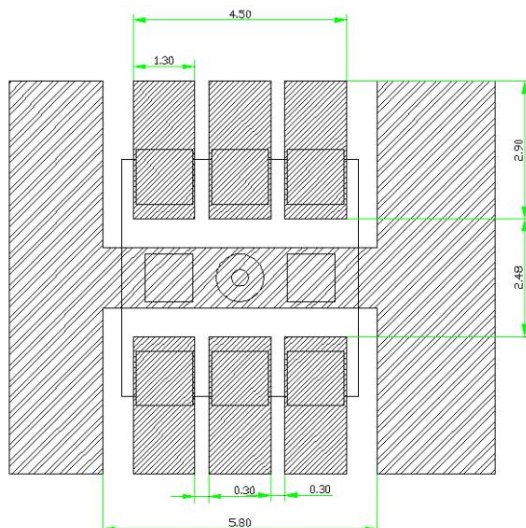
● Lead Solder



● Lead-free Solder



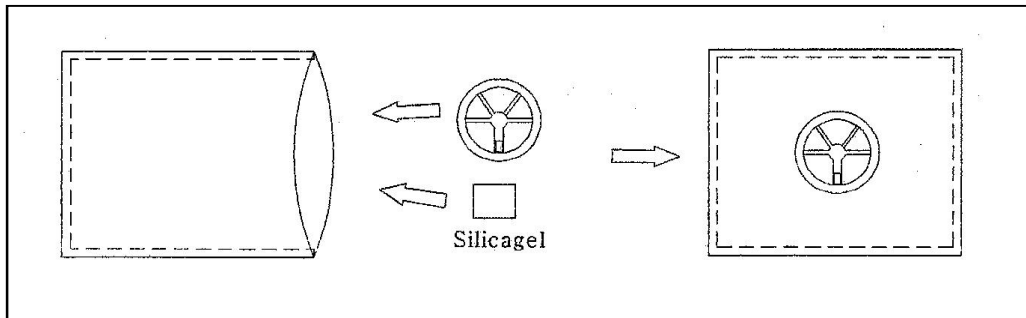
\*Soldering Dimension [Unit: mm]



## 9. Storage Condition

In order to avoid the absorption of humidity during storage, this product is water proof packed

- Temperature : 5°C~30°C
- Humidity : Less than 60% RH



## 10. Treatment after opening

1) Please Use within 7 day after opening under following conditions :

- Temperature : 5°C ~ 30°C
- Humidity : Less than 60% RH

2) In case the devices are not used for a long time after opening, the storage in dry box is recommended.

Or repack the devices with a silica-gel by the sealer, and put them in the same storage condition as

9-1). Then they should be used within 2 Months

3) Soldering Process should follow after a following baking treatment if unused term is over the conditions of

9-2).

In taping : Temperature : 60°C

Maintain time : 9 ~ 10 Hours

In individual (or PWB) : Temperature : 110°C

Maintain time : 3 ~ 4 Hour

## 11. Reliability Test Conditions

Test Items	Test Conditions	Hours/Cycles	Fail / Sample
Normal Temperature Life Time	$T_a=25^{\circ}\text{C}$ , $I_F=60\text{mA}$	1000hrs	0/22
High Temperature Life Time	$T_a=85^{\circ}\text{C}$ , $I_F=60\text{mA}$	1000hrs	0/22
Temperature Humidity Bios	$T_a=85^{\circ}\text{C}$ / RH=85%, $I_F=60\text{mA}$	1000hrs	0/22
High Temperature Storage	$T_a = 100^{\circ}\text{C}$	1000hrs	0/22
Low Temperature Storage	$T_a = -40^{\circ}\text{C}$	1000hrs	0/22
Temperature Shock Cycle	$-40^{\circ}\text{C} \sim 110^{\circ}\text{C}$ 20min	200 cycles	0/22
Reflow	Temp : $260\pm 5^{\circ}\text{C}$ 5sec	3 times	0/22
ESD (HBM)		3 times Discharge	0/22
	- R1 : 10 MΩ, R2 : 1.5 kΩ, C : 100 pF		

## 12. Criteria For Judging The Damage Conditions

Items	Symbol	Test Conditions	Limit	
			Min	Max
Forward Voltage	$V_F$	$I_F=60\text{mA}$	U.S.L * 1.1	
Cx, Cy	Cx, Cy	$I_F=60\text{mA}$	L.S.L * 0.9	U.S.L * 1.1
Luminous Flux	$\Phi_v$	$I_F=60\text{mA}$	L.S.L * 0.7	

Note

U. S. L : Upper Standard Level

L. S. L : Lower Standard Level

### 13. Precaution for use

1. This device should not be used in any type of fluid such as water, oil, organic solvent, etc.

When washing is required, IPA should be used.

2. When the LEDs are illuminating, operating current should be decided after considering the maximum ambient temperature.

3. LEDs must be stored in a clean environment.

If the LEDs are stored for 3months or more after being shipped from Wise power,

A sealed container with a nitrogen atmosphere should be used for storage.

4. The LEDs must be used within seven days after opening the moisture proof packing.

Repack unused Products with anti-moisture packing, fold to close any opening

and then store in a dry place.

5. The appearance and specifications of the product may be modified for improvement without notice.

6. This LED is sensitive to the static electricity and electrical surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

On manual soldering, a solder tip must be grounded for usage.

If over voltage which exceeds the absolute maximum rating is applied to LEDs, it will cause damage to LEDs and result in destruction.

Damaged LEDs will show some unusual characteristics such as increase in leak current,

Lower turn-on voltage and no light emission at low current.