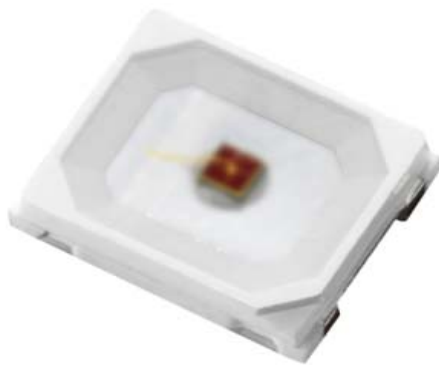


### SMD ■ Middle Power LED 67-21S/NFR2C-P2050A3B21522Z6/2T



#### Features

- PLCC-2 package
- Top view Red LED
- Wide viewing angle
- Pb-free
- RoHS compliant

#### Description

The Everlight 67-21S package has high efficacy, Middle power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

#### Applications

- Decorative and Entertainment Lighting
- Agriculture Lighting
- General use

## Device Selection Guide

Chip Materials	Emitted Color	Resin Color
AlGaInP	Far-Red	Water Clear

## Absolute Maximum Ratings ( $T_{\text{Soldering}}=25^{\circ}\text{C}$ )

Parameter	Symbol	Rating	Unit
Forward Current	$I_F$	60	mA
Peak Forward Current (Duty 1/10 @10ms)	$I_{FP}$	120	mA
Power Dissipation	$P_d$	135	mW
Operating Temperature	$T_{opr}$	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +100	$^{\circ}\text{C}$
Thermal Resistance (Junction / Soldering point)	$R_{th\ J-S}$	50	$^{\circ}\text{C/W}$
Junction Temperature	$T_j$	115	$^{\circ}\text{C}$
Soldering Temperature	$T_{sol}$	Reflow Soldering : 260 $^{\circ}\text{C}$ for 10 sec. Hand Soldering : 350 $^{\circ}\text{C}$ for 3 sec.	

Note:

The products are sensitive to static electricity and must be carefully taken when handling products

## Electro-Optical Characteristics ( $T_{\text{Soldering}}=25^{\circ}\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Radiometric Power	$I_v$	15	-----	50	mW	$I_F=60\text{mA}$
Forward Voltage	$V_F$	1.5	-----	2.2	V	$I_F=60\text{mA}$
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	$I_F=60\text{mA}$
Reverse Current	$I_R$	-----	-----	50	$\mu\text{A}$	$V_R=5\text{V}$

Notes:

1. Tolerance of Radiometric Power:  $\pm 11\%$ .
2. Tolerance of Forward Voltage:  $\pm 0.1\text{V}$ .

### Bin Range of Radiometric Power

Bin Code	Min.	Max.	Unit	Condition
A3	15	20	mW	$I_F=60\text{mA}$
A4	20	25		
A5	25	30		
B1	30	40		
B2	40	50		

Notes:  
Tolerance of Radiometric Power :  $\pm 11\%$

### Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
22	1.5	1.6	V	$I_F=60\text{mA}$
23	1.6	1.7		
24	1.7	1.8		
25	1.8	1.9		
26	1.9	2.0		
27	2.0	2.1		
28	2.1	2.2		

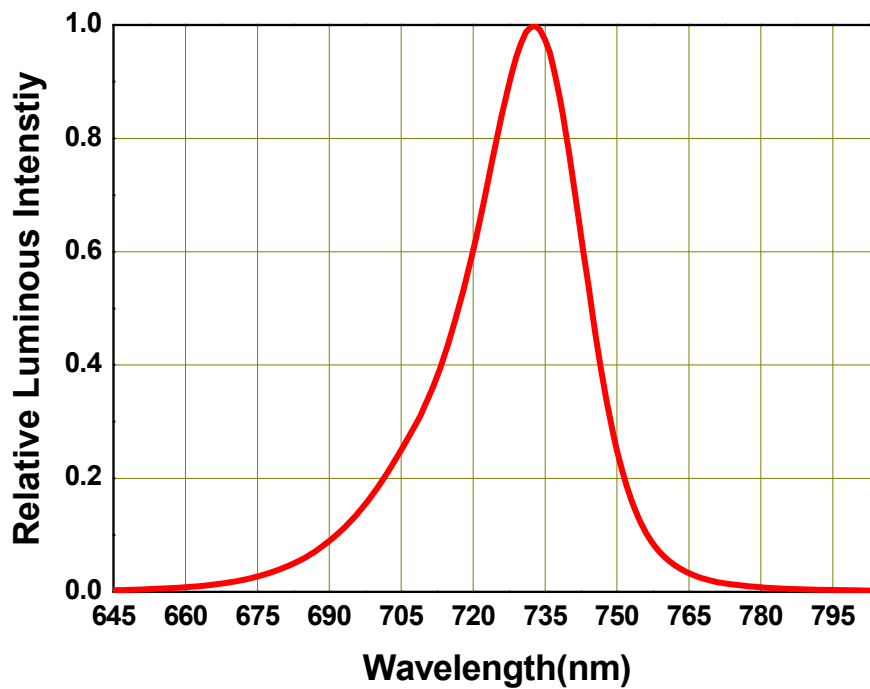
Note:  
Tolerance of Forward Voltage:  $\pm 0.1\text{V}$ .

### Peak Wavelength Bins

Bin Code	Min.	Max.	Unit	Condition
FA3	720	730	nm	$I_F=60\text{mA}$
FA4	730	740		
FA5	740	750		

Notes:  
Dominant / Peak wavelength measurement tolerance:  $\pm 1\text{nm}$ .

## Spectrum Distribution



## Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

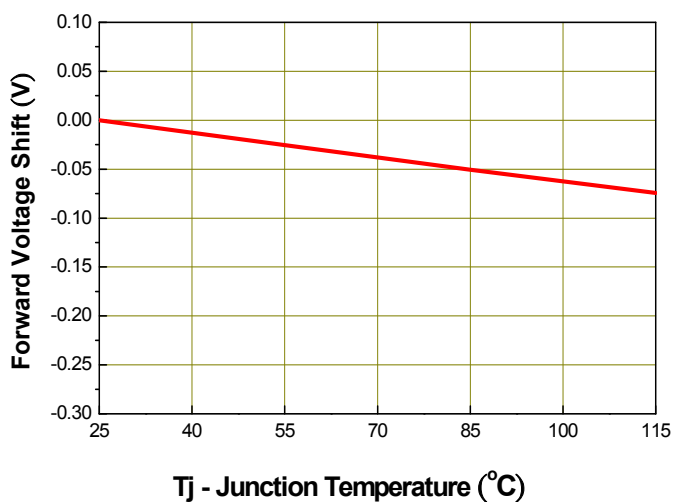
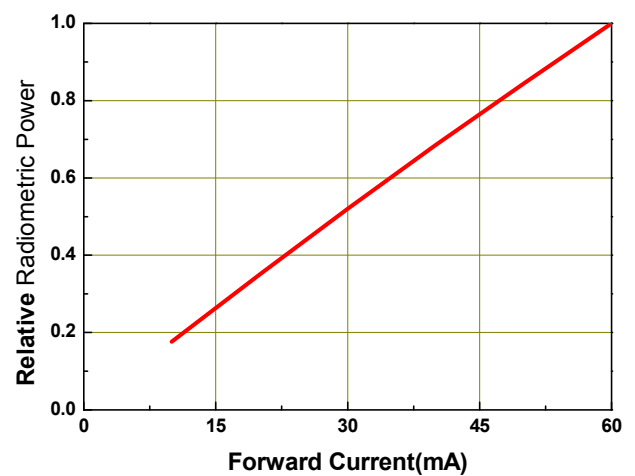
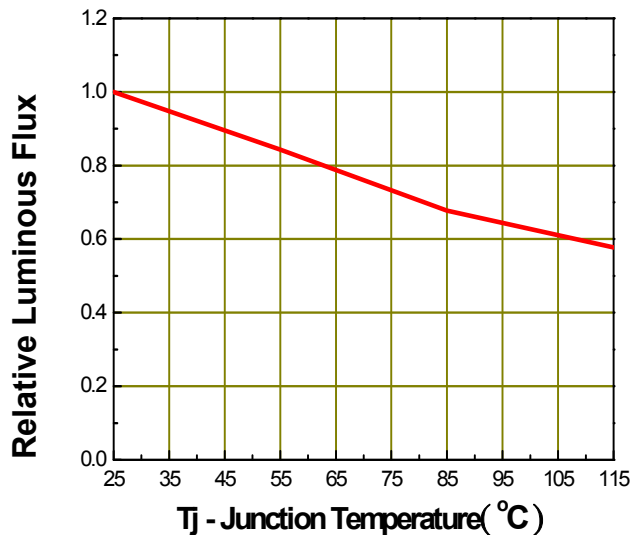


Fig.2 - Relative Radiometric Power vs. Forward Current

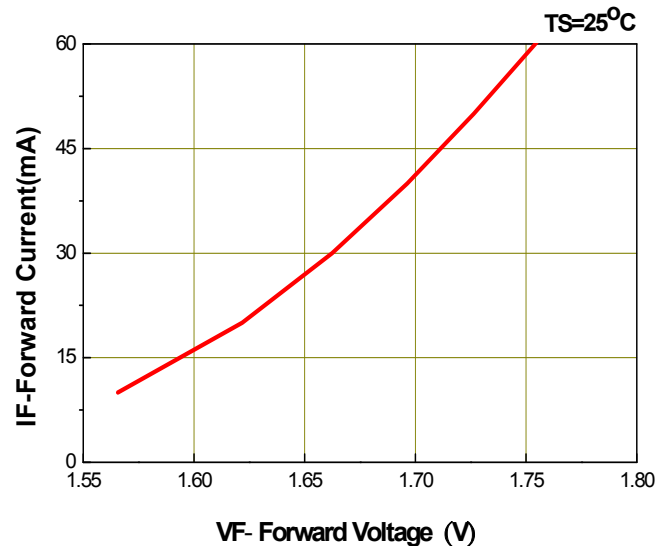


## Typical Electro-Optical Characteristics Curves

**Fig.3 - Relative Luminous Intensity vs. Junction Temperature**

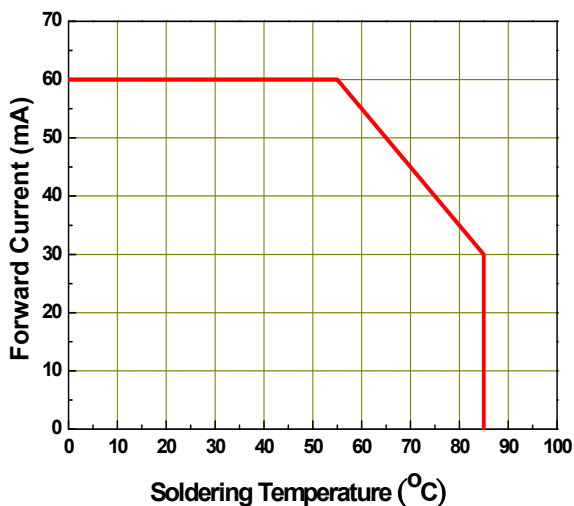


**Fig.4 - Forward Current vs. Forward Voltage**

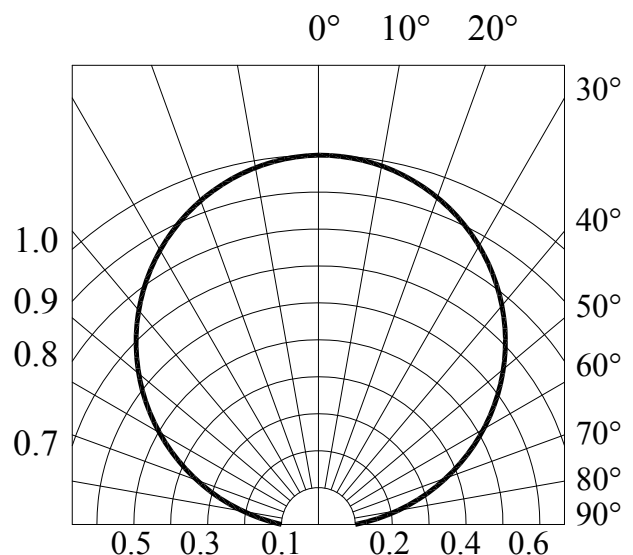


**Fig.5 - Max. Driving Forward Current vs. Soldering Temperature**

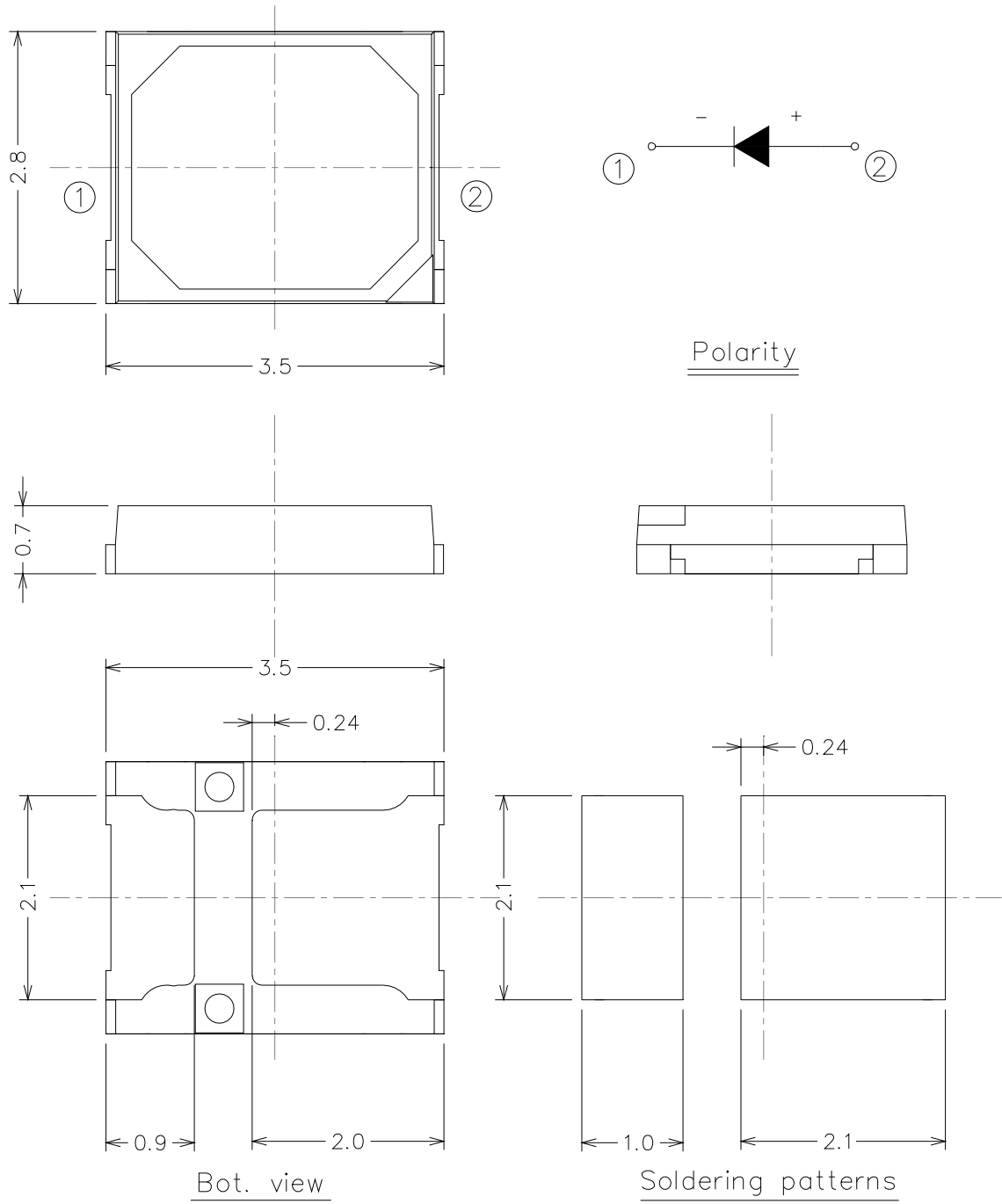
$R_{th\ j-s} = 50\ ^\circ\text{C/W}$



**Fig.6 - Radiation Diagram**



## Package Dimension



Note:  
Tolerance unless mentioned is  $\pm 0.1$  mm; Unit = mm

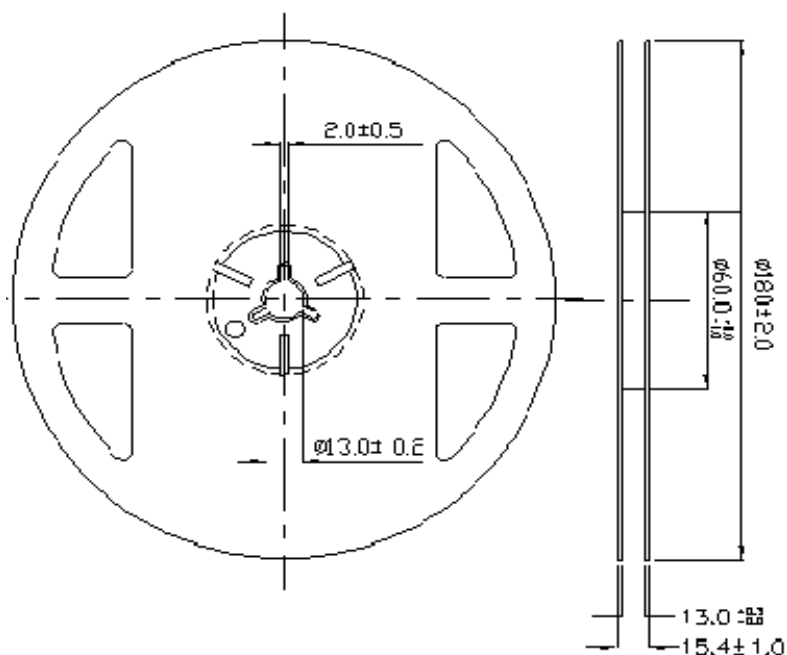
## Moisture Resistant Packing Materials

### Label Explanation



- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

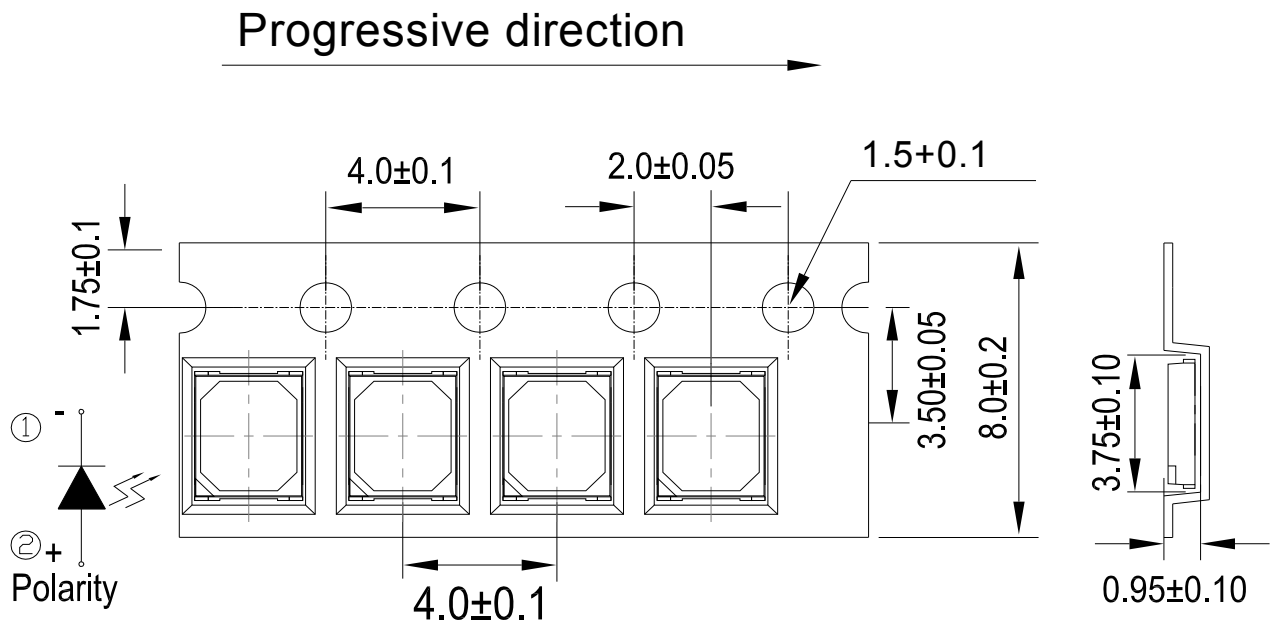
### Reel Dimensions



#### Note:

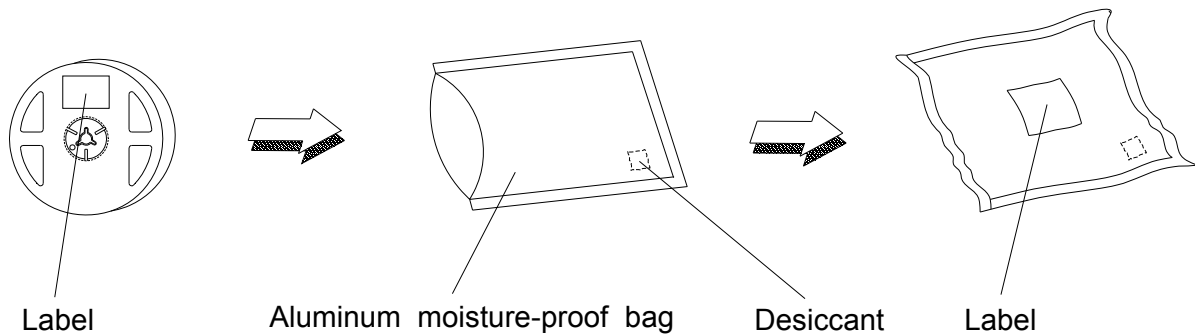
Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 4000 pcs. Per Reel



Note:  
Tolerance unless mentioned is  $\pm 0.1\text{mm}$ ; Unit = mm

#### Moisture Resistant Packing Process





## Reliability Test Items and Conditions

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

Confidence level : 90%

LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100°C 20min ∫ 10 sec L : -10°C 20min	200 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100°C 30min ∫ 5 min L : -40°C 30min	200 Cycles	22 PCS.	0/1
4	High Temperature/Humidity Storage	Ta=85°C,85%RH	1000 Hrs.	22 PCS.	0/1
5	High Temperature/Humidity Operation	Ta=85°C,85%RH, I <sub>F</sub> =30mA	1000 Hrs.	22 PCS.	0/1
6	Low Temperature Storage	Ta=-40°C	1000 Hrs.	22 PCS.	0/1
7	High Temperature Storage	Ta=85°C	1000 Hrs.	22 PCS.	0/1
8	Low Temperature Operation Life	Ta=-40°C, I <sub>F</sub> = 60mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25°C, I <sub>F</sub> = 60 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55°C, I <sub>F</sub> =60mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85°C, I <sub>F</sub> = 30 mA	1000 Hrs.	22 PCS.	0/1

## Precautions for Use

### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

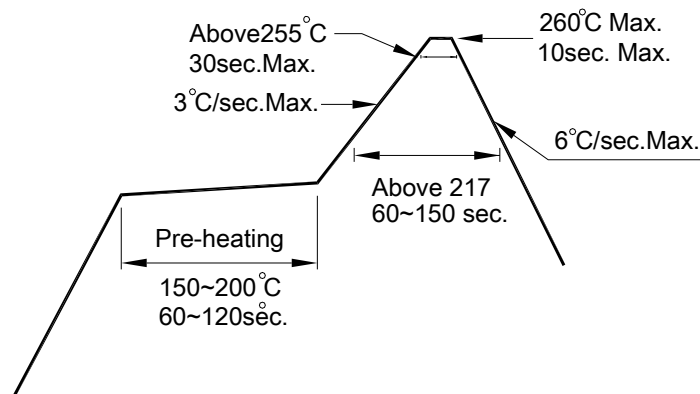
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5°C for 24 hours.

### 3. Soldering Condition

#### 3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

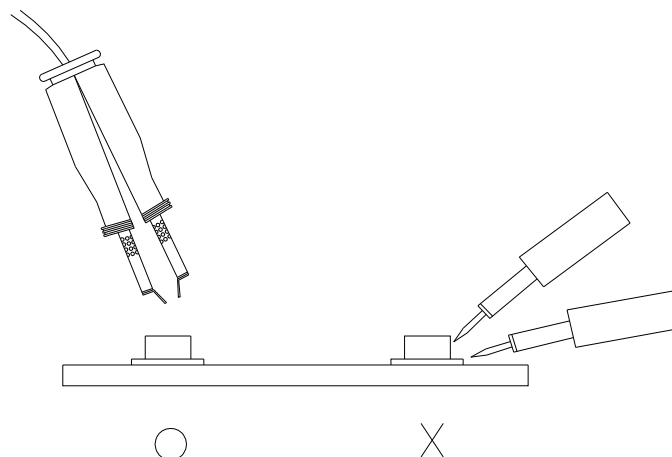
3.4 After soldering, do not warp the circuit board.

### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

### 5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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